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The fossil evidence for human evolution has expanded dramatically over the past 30 years and the rapid growth of this record has challenged the traditional approaches of a classroom lecture and hands-on laboratory. In order to provide current information to students, we have built a robust collaborative website, eFossils.org. This website incorporates various data from human evolution (e.g., anatomy, geology, geography, geochronology) within a multimedia learning environment (e.g., color images, 3D animations, video) and offers a series of online tools to visually represent these data and permit their study. The eFossils catalog uses the Darwin Core schema and permits the display and management of data sets from any project. The website also includes a "collaboration" tool, a web tool designed to facilitate the research community to collaborate on large-scale problems. Collecting all information for human evolution into a single database is now too large an undertaking for any one group; instead, eFossils is constructed for the collaborative participation of subject-matter experts. We have populated eFossils with several site reports about key hominin fossil localities in order to seed the process of providing a data-rich online presentation. Additional localities can be populated through a collaborative expansion of the data provided by interested users. Consequently, the organic nature of eFossils reflects the dynamic nature of the field, and as more expand the database with their own research, the "ownership" of the site will transfer to the user communities in a manner that mirrors the online expert wikis.

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Occlusal microwear texture analysis of Croatian Neandertals.

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Aspects of Neandertal diet have been examined using a variety of techniques. Recently, dental microwear texture analysis has been used to make inferences about diet in Neandertals. Previous research by el Zaatari found that there was ecogeographic variation in Neandertal diet, with texture values being higher for Neandertals living in woodland areas than those living in dryer steppe regions. We examined 24 molars (preferably the lower M2) from Kraptina (n=20) and Vindija (n=4) using white light confocal microscopy. Three variables were assessed using Toothrax and Sfrax software to describe molar occlusal surfaces via scale-sensitive fractal geometry. The variables used were complexity (Asc), anisotropy (epLsr), and textural fill volume (tv/). We hypothesized that the molars from Kraptina and Vindija would have higher texture values than those reported for Neandertals from more open environments. Our results indicate that Vindija had complexity and anisotropy values (0.54 and 0.0027, respectively) that are comparable to woodland Neandertals and Pre-Neandertals. Likewise, Kraptina had complexity that is similar to woodland Neandertals (11.11), but its anisotropy is far higher (0.0042), indicating a more fibrous diet. Tv was higher for Vindija (46.36%) than Kraptina (35.51%) indicating that its diet was harder. Dates for Kraptina place it at approximately 120,000 years ago, which is far older than Vindija (about 42,000 years ago for level G3). The higher anisotropy at Kraptina might relate to its earlier age, slight ecological differences, or depositional environment.

Correlations between nitrogen isotope levels and stature in three Northern California prehistoric groups.

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This study examines the correlations between dietary isotope levels and adult human stature. Physical anthropologists have long recognized the association of health status and nutrition with stature. Bioarchaeological studies of health and nutrition in prehistoric groups attribute temporal variation in stature to changing subsistence strategies over time, with the animal protein content of diet considered a good predictor of variance in stature. Further, within-group differences in protein intake have been found to be positively correlated with nitrogen isotope values (8N) in modern human populations. These positive correlations, one between stature and dietary protein, and the other between dietary protein and 8N levels, imply that may 8N may be a useful predictor of stature. This study tests the hypothesis that within-group variation in 8N levels and stature are positively correlated in prehistoric California groups. Skeletal remains from Marsh Creek (CCO-548), Hesalanon (ALA-554), and Ryan Mound (ALA-329) were studied, providing data for groups with an intensive marine resource subsistence strategy and an intensive acorn-processing subsistence strategy. Based on preliminary analysis of the Marsh Creek sample, a linear model of stature regression on both sex (a consistently useful with in-group predictor of stature) and 8N levels (AIC = 344; adjusted R² = 0.51) outperforms the model in which stature is predicted based on sex alone (AIC = 349; adjusted R² = 0.43). These results suggest that further potential utility to integrating dietary isotope and morphological data in bioarchaeology.

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Identification of historic individuals: the unknown sailor from the HMAS Sydney II.

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The ability of physical anthropologists to identify historic individuals through a range of analytical techniques has assisted investigators and engaged the public in our discipline. Stable isotope analysis of a range of elements along with osteological, dental, historical and DNA evidence have all been carried out in an attempt to identify an unknown sailor from the 1940s. On November 19, 1944, the naval vessel, HMAS Sydney II sank off the western coast of Australia following a battle with a German ship. The loss of all 645 crew members of the HMAS Sydney II was the largest single naval loss in Australian military history. In February of 1942, an unidentified dead sailor was recovered from a life raft near Christmas Island, where he was buried following a post mortem examination. As the only potential link with the HMAS Sydney II, there has been tremendous public interest in the identification of this individual, who was exhumed in 2006. Osteological analysis indicates that the individual was a young male of European ancestry who suffered a thriftful wound to the head. Isotopic analyses were carried out on a rib fragment and one tooth. Results for carbon, nitrogen, sulfur and soriomote isotopes are consistent in identifying a diet very high in marine foods and oxygen isotopes indicate a place of residence in the tropics. These analyses highlight both the potential and the limitations of the various analytical methods employed. While the exact identification remains uncertain, the range of possibilities has been reduced considerably.

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Unexpected regional differences in collagen fiber orientation heterogeneity (CFO-Het) between chimpanzee and human proximal femoral shafts: is CFO-Het still a useful characteristic for corroborating lead history data?

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Gray levels (GLs) in circularly polarized light (CPL) images reflect predominant collagen fiber orientation (CFO) (Skeet et al. 2011). Anatomy, CFO-Het, measured as the full-width at half-maximum (FWHM) of a GL/CFO profile, has been shown to corroborate the bending load history in the chimpanzee proximal femoral shaft (Keenan et al. 2011 AAPA). Based on this previous chimpanzee study, greater CFO-Het in compression "cortexes" was also expected in the human femur. Twenty-four sections from 12 adult human proximal femoral shafts were
ABSTRACTS

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Perceptions of "typical" Lemur catta behavior are based primarily on captive and gallery forest studies. The objective of this study is to compare assumed species-typical behaviors with data collected during a long term study on this species in a completely different environment: the semi-desert conditions of Cap Sainte-Marie (CSM), Madagascar. The specific behaviors that are investigated include 1) activity budgets, 2) agonism trends, 3) group cohesion patterns, 4) dyadic bonds, and 5) adult to immature relationships. Data have been collected on two different troop samples through daily follow-up using focal animal and scan sampling methods. Over 1,019 hours of behavioral data are included in the analyses.

Relative to other populations, CSM Lemur catta are highly social, and immatures are central to troop dynamics. In fact, a major form of agonism in one troop especially seems akin to socialization. Convergently, while female targeted aggression is not a primary agonistic form with these troops, there is also an absence of strong female dyads. Last, there are consistent affiliative interactions between resident males and troop immatures, and no males dispensed from one troop during the 15 months of observations. Based on these findings, I conclude that the social organization of CSM L. catta is largely shaped by two factors: 1) a lack of multigenerational matriline and 2) a rear absence of inter-troop contact. I also propose that L. catta may be predisposed for behavior such is paternal care, but that these behaviors are typically suppressed in other studied troops because of these factors. This study was funded by the Field for Conservation-St. Louis Zoo, Lambda Alpha, National Science Foundation 0732134 (PI Robert W. Sussman), and Primate Conservation Inc.

Bioarchaeological analysis of unlooted tombs from Coclachiuko in Nasa, Peru (AD 650-750) reveals disease and trauma patterns during the period leading up to Wari Imperial incursion.

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The latter portion of the Early Intermediate Period in Nasca, Peru (AD 650-750) was characterized by burgeoning social and trade networks before the expansion of the Wari and Tiahuanaco states. The Nasca were important to the Wari state, as evidenced by similarities in ceramic technology and iconography. Even with these associations, recent archaeological and bioarchaeological studies have revealed variation in the Nasca response to Wari incursion. Ten individuals from nine unlooted tombs from Coclachiuko, one of the largest sites in the region during this time period and located near the later Wari outposts of Pataraya, were excavated and analyzed. Almost all individuals exhibit the Nasca fronto-occipital style of cranial vault modification and are seated flexed facing south. The most common pathology was anemothorn tooth loss, but few individuals show evidence of osteoarthritic reactions. Osteoarthritis, sponyosclerosis, Schmorl's nodes, and postcranial fractures attest to physical activity characteristic of Nasca lives. One tomb also contained a rare headless burial of a young male and may clarify the practice of Nasca 'trophies' head taking. These bioarchaeological analyses contribute new data on Nasca individuals during a period of great social change.

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Low, sexually-nonomorphic digit ratios in a wild strepsirrhine primate (Microcebus rufus).

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The relative lengths of the second and fourth digits (2D:4D) are considered a marker for prenatal androgen exposure. Lower ratios are generally characteristic of males in humans and anthropoid primates, and have been correlated with a wide range of presumably androgen dependent behavioral and morphological traits within species (increased aggression, dominance and physical size) as well as between species (increased intrasexual competition, reduced pair bonding). 2D:4D sexual dimorphism is well characterized in humans and reported for several anthropoids, however the data presented here represent the first assessment of digit ratios in a strepsirrhine, the brown mouse lemur (Microcebus rufus). Due to the female dominance and overall sexual non-morphism typical of lemurs, and the comparable levels of fecal testosterone in this species' males and females, we expected to find no evidence of dimorphism. Digital measurements of rays were taken on all potential ratio combinations analyzed for male (n=28) and female (n=21) brown mouse lemurs in a wild population in Ranomafana National Park, Madagascar. No sexual dimorphism were found (p values between 0.38 and 0.82). However, the low 2D:4D (0.75) of these polygynous lemurs fits well with the negative correlation established between intrasexual competition and 2D:4D in anthropoid species, despite the typically strepsirrhine manual anatomy of M. rufus and the mesaxony of the anthropoid species. Implications for comparisons of a full range of digit ratios within and between groups with mesaxonic and ectaxonic hands will be discussed.

Sex estimation using pubic bone morphology in a modern South African sample: a test of the Klages et al. method.

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