

d'Antananarivo) can now be recognized as belonging to *Hadropithecus*. In addition, an analysis of the enamel microstructure of an isolated molar has elucidated previously unknown aspects of its life history.

Hadropithecus exhibits highly derived postcranial characteristics, some of which are cercopithecoid monkey-like (e.g. carpal), African ape-like (e.g. femoral), or unique (e.g. metapodial). The hindlimb is robust and anteroposteriorly compressed, the forelimb relatively long and gracile. The digits are short. The thorax is relatively deep and narrow, the pelvis broad, and the tail long. The terrestrial quadrupedalism signal in the skeleton is verified but should not be overstated; there is no evidence for suspensory behaviors in the arbo-terrestrial repertoire. Molar crown formation time is far longer than that of any other lemur analyzed to date, including its sister taxon, *Archaeolemur*.

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Mummified trauma: SEM analysis of obsidian and chert induced wounds.

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This research highlights the capability of mummified tissues to retain wound morphology, and the value of using Scanning Electron Microscopic (SEM) analysis for identifying class characteristics of weapons in soft tissue trauma.

Previous SEM analyses of trauma have demonstrated that the morphology of kerf surfaces can indicate the class of implements that produced the kerf (Tucker, 2001). Thus, SEM analysis of skin trauma from prehistoric mummies or modern homicides should reflect the class of implements that produced the trauma. Although trauma can be caused by innumerable weapons, the present study will be limited to the analysis of mummified cut marks inflicted by chert and obsidian stone tools on fresh human skin.

To simulate trauma, obsidian and chert stones were knapped, and used to induce trauma by striking the stone onto the intact and in situ skin. A total of 9 samples were harvested, which were mummified naturally or induced by silica. SEM images of the kerf walls were then obtained and analyzed.

The results from this preliminary study provide two important contributions. This study shows that mummified tissues are capable of retaining soft tissue trauma,

and that SEM analyses could allow for chert-induced trauma to be differentiated from trauma produced by obsidian. Thus, mummified tissues may represent an alternative source for analysis of trauma and for weapon identification from both prehistoric and modern forensic contexts.

The cervical vertebrae from the Sima de los Huesos site (Sierra de Atapuerca, Burgos, Spain).

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The Sima de los Huesos (SH) site in the Sierra de Atapuerca (Burgos, Spain) contains the largest known sample of fossil humans from the Middle Pleistocene. To date more than four thousand human remains have been recovered. Among these are more than 350 vertebral fossils, more than 100 of which belong to the cervical segment, representing both immature and adult individuals. We present here an inventory and preliminary description of all the cervical vertebral remains with the most accurate anatomical determination and age at death. Among the cervical vertebrae, we have identified a minimum of 9 atlases, 10 axes and 35 C3-C7 specimens, all of which, after recognizing some associations between the elements, represent at least 10 individuals, based on the axis.

Metric and morphological analysis of the most complete vertebrae reveals that most of the metric dimensions are well within the modern human range. Nevertheless, the SH vertebrae share some features with the Neandertals which differentiate both of them from modern populations of *Homo sapiens*, such as the ratio of maximum height of the axis/superior transverse diameter and the length of the spinous process of the C5. This first feature is also present in Skhul V, and it could represent a primitive feature for the genus *Homo*.

Variation in the juvenile craniofacial form: a pilot study.

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Much research has been conducted in the area of age determination of juvenile

skeletal remains for biological profiling purposes within a medico-legal context. However, the ability to determine sex and group affiliation from juvenile skeletons is limited and often unreliable (Kerley, 1976). In fact, identifying sex and group specific differences with any degree of reliability is one of the major problems in the analysis of juvenile skeletal remains (Scheuer and Black, 2000).

This pilot study presents initial findings of human variation as expressed in the juvenile craniofacial form. A sample of 28 groups divided according to age, sex, and group affiliation was studied utilizing 22 common cephalometric measurements of American children of African and European descent. A glm manova procedure and principal component analysis served to test for the presence of sex and group specific features in the juvenile craniofacial skeleton throughout development.

The findings of this initial investigation demonstrate a statistically meaningful sex and group specific pattern of size and shape differences throughout development. Additionally, this study suggests that for each age group category utilized in the analysis, ages 6-12, it is possible to clearly identify the sex and group affiliation of juvenile skeletal remains for forensic biological profiling purposes. If the preliminary results are correct, then this investigation provides evidence of morphological differences that can be accurately identified throughout craniofacial development. These findings provide the basis for future research in which this investigator will use to develop biological profiling standards for juvenile skeletal remains.

Body size dimorphism: do not correct for size.

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A persistent question for researchers of body size dimorphism (BSD) is whether it is appropriate in comparative analyses to account for relationships between size and BSD, usually by analyzing residuals from regressions of BSD on size. Alternatively, researchers can analyze BSD itself. Both techniques have been used in primate literature, yielding different results. Size correction is appropriate only if changes in size cause changes in BSD; if not, size "correction" removes important variation relevant to other variables that likely influence BSD (e.g. variables related to sexual selection such as mating system).

Inter-specific relationships between female body size, BSD, and mating system

for 111 anthropoid species are analyzed here using traditional (ordinary least squares regression) and phylogenetic methods (phylogenetic generalized least squares models) to determine whether relationships between size and BSD exist when mating system has been taken into account. Traditional analyses show that although BSD scales positively with size among anthropoids as a whole and within platyrrhines, cercopithecines, colobines, and hominoids (at $\alpha = 0.05$), positive scaling is not present in analyses of covariance that include mating system nor in regressions performed separately within each mating system. Comparisons of phylogenetic models where BSD is the dependent variable show that addition of mating system as an independent variable always significantly improves model fits; addition of body size does not significantly improve model fit for any of the study groups. These results indicate that it is inappropriate to "correct" for size in analyses of BSD.

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Variation in fecal testosterone levels, intermale aggression, dominance rank and age during mating and post-mating periods in wild adult male ring-tailed lemurs (*Lemur catta*).

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In primate species exhibiting seasonal reproduction, patterns of testosterone secretion in adult males are highly variable: in some species, peaks correlate with female receptivity periods and heightened male-male aggression over access to estrous females, in others, neither heightened aggression nor marked elevations in testosterone have been noted. In this study, I examined mean fecal testosterone levels and intermale aggression in wild adult male ring-tailed lemurs residing in three groups at Beza Mahafaly Reserve, Madagascar. Results obtained from one mating season and two post-mating periods were compared in order to test the "challenge hypothesis", which predicts a direct relationship between male testosterone levels, mating systems, and reproductive strategies. A significant difference was found in mean fecal testosterone levels between mating and immediate post-mating periods in 2003, and there was also a marked difference in rates of pre- and post-mating intermale aggression. The highest-ranking males in the groups prior to the onset of mating exhibited higher mean testosterone levels than

lower-ranking males, and young males exhibited lower levels compared to prime and old males during the breeding season. In the post-mating periods of 2001 and 2003, individual male mean testosterone levels did not differ between groups, nor were there rank or age effects. Thus, although male testosterone levels rose in relation to mating and heightened male-male aggression, males offset the costs of mating (marked male-male competition) by immediately reducing levels of aggression as soon as females were no longer receptive, which correlated with a dramatic decrease in mean testosterone levels.

Dental health decline in the Chesapeake Bay, Virginia: the role of European contact and multiple stressors.

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This study tests the hypothesis that the arrival of Europeans in Jamestown, Virginia had a negative impact on the dental health of native populations in the Chesapeake Bay. Data were collected on three variables—dental caries, periapical cavities, and antemortem tooth loss—in a sample of 644 individuals from four prehistoric (N=500) and two contact era ossuaries (N=144) from the Potomac Creek site in Virginia (44ST2).

Statistical analysis reveals a clear trend of poorer dental health for the post-contact sample (chi-square; $p < 0.05$). The temporally latest ossuary had the highest prevalence of all indicators. There is also a trend toward poorer dental health for females relative to males. In particular, females have a higher prevalence of carious lesions and antemortem tooth loss than males. Sex differences in dental health probably correspond to sex-based differences in food production and preparation in this setting. Multiple factors likely explain the general pattern of decline in dental health, including: 1) a change in diet involving greater consumption of carbohydrates, 2) increased exposure to infectious pathogens, 3) warfare and other forms of conflict, 4) strain on resources, and 5) increased population density.

Significantly high variation at the mitochondrial 9bp repeat locus in the Sakha of Siberia.

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The mitochondrial 9bp repeat locus is a commonly studied polymorphism. The most common variant is a single copy of the repeat sequence, also known as the deletion allele, which exhibits a frequency cline in Asian populations from 0-100%. We assayed variation at the 9bp repeat locus in 779 Sakha, 88 Khakas, and 30 Kalmyk individuals from Siberia. The deletion allele was present at a frequency of 1.7% in the Sakha, which was significantly lower than in other southern Siberian populations ($p < 0.01$). A triplication allele was found in six individuals in the Sakha and the heteroplasmy allele was detected in four individuals (two individuals with 2/3/4 copies, one with 2/3 copies, and one with 1/2 copies). This represents the highest frequency of triplication and heteroplasmic variants ever reported for a single population ($p = 0.004$).

HVRI sequencing was performed on all individuals with derived variants. Heteroplasmic variants were detected in conjunction with three haplogroups (C, D, and K) and triplication alleles were found on three haplogroup backgrounds (C, D, and T). The deletion variant was found in conjunction with Asian haplogroup B and with European haplogroup W. All of these haplogroups are common in the Sakha. No neighboring populations have been reported to carry the heteroplasmy or triplication variants, suggesting that admixture or presence in a pre-Sakha population are unlikely explanations for the high number of variants in the Sakha. Furthermore, the presence of four heteroplasmic individuals suggests a recent evolution of these variants, which may implicate a mechanism involving mutation rate or natural selection.

Primate sanctuaries, taxonomy and survival: a case study from South Africa.

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The relationship between humans and non-human primates in South Africa is both complex and problematic. On the