in FA, we developed a new variable, asymmetrical growth (AG). AG is the amount of asymmetrical growth that occurs during a specified time, calculated by taking the absolute value of the difference of signed FAs from two samples (six month intervals). AG is an indicator of the temporal stability of FA.

Results: (a) Longitudinal patterns of FA are more closely associated with environmental insults than cross-sectional FA data. (b) FA is not cumulative. Growth after insults can lead towards or away from symmetry. In periods without insults, growth reduces FA in six of the eight traits measured. (c) The direction of asymmetrical growth among traits is independent. These results are consistent with the recovery hypothesis (#3 above), and suggest ontogenetic mechanisms for symmetrical growth.

Endocranial capacity estimated from 3-D CT: Methodological issues.

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Cranial capacity has long been considered a key parameter in understanding the mode and tempo of hominid evolution. In recent years, 3-D computed tomography (CT) has been used to extract virtual endocasts (VE) from human and fossil hominid crania. Although the resolution of CT can be very high (submillimeter), subtle methodological decisions about how to delimit the endocranial margin can be shown to have large effects. Spoor et al. (1993) suggest using half of the maximum height of the peak in a histogram taken in cross-section of cortical bone to define the edge. While this method works for linear measurements, it is not suitable for large endocranial surfaces, which vary widely in thickness across more than ~60,000 surface voxels.

This problem is not clearly addressed in published studies of endocranial volume. To determine the extent to which the selection of a single global threshold value for edge delimitation can influence the estimation of cranial capacity, we extracted VEs from 13 *Homo sapiens*, 1 *Pan troglodytes*, and 1 *Gorilla gorilla* crania using two different threshold values: one that minimizes the need to hand-delimit thin areas of bone, and another arbitrarily chosen to be twice that value. Both VEs differ imperceptibly in shape, yet by 1.42% in volume on average. This translates into differences of ~20 cc for a 1400 cc endocast. Comparison with traditional bead-fill measurements on these specimens will also be presented. An image-based edge-detection algorithm that may provide a more objective, accurate, and consistent solution will be discussed.

A preliminary assessment of the microfaunal assemblage from the Coopers D deposit, Gauteng, South Africa.

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The Coopers site is a hominin fossil locality in the Cradle of Humankind, Gauteng, South Africa. The site is situated between Sterkfontein and Kromdraai, and dates to the Plio-Pleistocene. Recent work has focused on analyzing new hominin material, as well as the abundant and diverse faunal remains contained in the Coopers D deposit. This prior research suggests a date of between 1.6 to 1.9 Ma for the deposit.

In addition to the numerous large mammals excavated from the Coopers D deposit are a tremendous number of small mammal fossils. Current research on this large microfaunal assemblage is focused on identifying the species represented and using information from these species to rebuild the paleoenvironmental conditions of the site. Taxa uncovered thus far are represented primarily by *Otomys irroratus*, *Aethomys chrysophilus*, *Acomys spinosissimus*, and *Mystromys albicaudatus*, with the later group represented in the highest frequency. Other taxa identified belong to groups including the shrews, elephant shrews, and moles. These taxa are present in the Gauteng region today and have been recovered from other sites of similar age, although conclusive species identification awaits more complete cranial specimens.

Preliminary analysis of the fauna is consistent with interglacial conditions and a grassland habitat. The species are generally associated with rocky terrain and sandy soil, and the presence of *O. irroratus* suggests a permanent water source in the area. Analysis of the microfaunal assemblage allows the hominin fossils from Coopers to be viewed in a more detailed paleoenvironmental context.

Stained v. clean males: Female power maintains male bimorphism in Verreaux's sifaka (*Propithecus verreauxi verreauxi*).

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Male Verreaux's sifaka exhibit a bimorphism that is reversible and related to dominance rank. Dominant males exhibit a pronounced brown staining around their sternal gland (stained males) and subordinate males do not (clean males). Adult sifaka in six social groups were studied in Kirindy Forest, Madagascar, to determine whether intersexual relationships vary with male chest status. Behavioral data were collected using focal animal sampling and all-occurrence methods from November 2000-March 2002. Results from this study indicate that the two male morphs behave significantly differently and that intersexual relationships in sifaka are dependent upon male chest status. Stained males scent-marked at higher rates and overmarked female scent-marks more frequently. Stained males also spent a greater proportion of their time in proximity to females. Per time in proximity, however, the clean males received a significantly lower rate of aggression from females. Females actively mated with both types of males and were observed to be hostile towards stained males attempting to interfere with females copulating with clean males. Moreover, females were responsible for maintaining proximity with the clean males but not with the stained males. Thus, male-female relationships in sifaka seem to be dependent upon male chest status, with females and stained males in direct conflict over clean males. This study demonstrates (1) the ability of females to manipulate male residency and (2) how female power can strongly influence social organization and dynamics. This research was funded by the Leakey Foundation, Wenner-Gren Foundation, and NSF Dissertation Improvement Grant (#0002570).

Functional differentiation between the clavicular and caudal heads of the pectoralis major muscle in *Homo sapiens*.

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This study uses electromyographic and kinematic methods to investigate the functional differentiation between the clavicular and caudal heads of the pectoralis major muscle in *Homo sapiens*. The clavicular head of the pectoralis major muscle is present in *Alouatta*, *Lagothrix*, *Hylobates*, *Pan*, *Gorilla*, and *Homo*, but