hominid pedal evolution and the ways in which natural selection alters bony anatomy in response to ecological, behavioral, and locomotor demands.

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Comparison of endocranial and ectocranial "symmetry planes" and application to the virtual reconstruction of hominid fossils.

SYLVAIN PRIMA[1,2], GÉRARD SUBSOL[3], JOSÉ BRAGA[4], JUAN-FRANCISCO GARAMENDI[1,2], BENOIT COMBÈS[1,2], JEAN DUMONCEL[4] and DEAN FALK[5,6]. [1]VISAGES, INRIA, INSERM, VisAGeS U746 Unit/Project, F-35042 Rennes, France, [2]VISAGES, University of Rennes I-CNRS UMR 6074, F-35042 Rennes, France, [3]ICAR, Laboratoire d'Informatique de Robotique et de Microélectronique de Montpellier (LIRMM) CNRS : UMR5506 – Université Montpellier II, [4]AMIS, CNRS : FRE2960 – Université Paul Sabatier - Toulouse III, [5]SAR, School for Advanced Research, Santa Fe, NM 87505, [6]Department of Anthropology, Florida State University, Tallahassee, FL 32306.

It is not entirely clear how the asymmetries of the skull and those of the brain relate to each other in hominids. However, in absence of well-defined landmarks on endocranial casts, it is common to use landmarks delineated on the skull to define a reference plane about which endocranial asymmetries are inferred, and to reconstruct a missing portion of an endocast with its "mirror image". The validity of these procedures is largely unknown. We investigate this question by defining and computing three different symmetry planes on several individuals. The first plane is computed by superimposing the outer (ectocranial) surface of the skull with its mirror image. This definition uses all the points of the surface, a probabilistic modeling of the latter, and the principle of maximum likelihood; the plane is ultimately computed using the expectation-maximization algorithm, and the whole procedure is fully automatic. The second plane is defined and computed in the same way, but using the inner (endocranial) surface of the skull. The third plane is the best-fit (using least squares regression) plane through a set of inter-hemispheric, endocranial, manually delineated landmarks. These planes are computed and compared in a quantitative way on two modern humans (young and adult), two modern chimpanzees (juvenile and adult) and one *Australopithecus africanus* (Mrs Ples, STS 5). Based on this study, a tentative virtual reconstruction of the endocast of the Taung Child, whose left endocast is mostly missing, is proposed.

It's all in the wrist: manipulative dexterity in white-handed gibbons (*Hylobates lar*).

JACQUELINE M. PRIME. Department of Anthropology, Southern Illinois University Carbondale.

Manual complexity in great apes is considered to be an important facet of hand evolution, reflective of advanced cognitive skills, and is likely influenced by morphological adaptations in hand shape related to suspensory lifestyles. Relatively little is known about the manual abilities of the small apes, but they are generally assumed to have limited manual complexity because of their highly specialized hands. This study examined manual skill during foraging in wild small apes (*Hylobates lar*) compared with similar-sized, sympatric monkeys (*Macaca nemestrina*) with a broadly similar dietary profile at Khao Yai National Park, Thailand, in order to directly test whether differing manual abilities facilitate access to more or different (higher quality) foods, and whether small apes demonstrate enhanced manual complexity when handling foods similar to that seen in great apes. Sixteen months of videotaped hand use were recorded for eight gibbon groups (16 animals) and one macaque troop (9 animals). Results show that gibbons have a larger manual repertoire for precision skill than macaques, gibbons demonstrate a unique form of previously undocumented hand-foot bimanual coordination during foraging, and their sophisticated feeding skills are directly related to greater wrist mobility in varying hand positions during feeding, especially in the terminal branches. These critical differences allow gibbons to be more selective in reaching and choosing foods than is possible for pronograde quadrupedal monkeys.

Determination of body surface area from a whole-body CT scan.

CHARLOTTE PRIMEAU[1], CHIARA VILLA[1], HANS PETTER HOUGEN[1], NIELS LYNNERUP[1] and BIRGER HESSE[2]. [1]Department of Forensic Medicine, University of Copenhagen, Denmark, [2]Department of Clinical Physiology and Nuclear Medicine, Rigshospitalet, Denmark.

The estimation of the body surface area (BSA) has been a challenge in the past centuries. Current techniques like 3D laser surface scan and CT-scanning, may be expected to quantify the BSA in an easier and more accurate way. Whole body CT-scans were obtained of 54 male cadavers between 20 and 87 years of age. Only individuals with intact skin and without post-mortem bloating were included. 3D reconstructions were generated from CT-scans using Mimics software and the BSA were automatically extracted from the program. The resulting BSA was compared with 4 predictive equations. We found no statistically significant difference between our CT-scan based results and the results obtained using the predictive equations of Du Bois and Du Bois (1916), Mosteller (1987) and Livingston and Lee (2001); but significant different was observed from between our equation and the equation of Yu et al. (2003). Using Bland and Altman (1986) plots, we assessed the agreement between our results and the Du Bois equation, which is the most widely used equation in clinical medicine. We found that the Du Bois equation underestimated BSA for underweight cases and overestimated for overweight and obese cases. We conclude that care must be taken especially when BSA is calculated for overweight and obese persons and new equations may be needed for such persons.

***Australopithecus afarensis* probably lacks a midfoot break.**

DANIEL J. PROCTOR. Anthropology, SUNY Buffalo State.

The *Au. afarensis* MT 4 fossil A. L. 333-160 was analyzed using three-dimensional morphometrics to test the hypothesis that the proximal articular surface is flat as in humans rather than highly convex as in apes. A humanlike articular surface would suggest that *Au. afarensis* lacked apelike tarso-metatarsal flexibility associated with a midfoot break. A principal components analysis compared the proximal articular surface shape of A.L. 333-160 to *Pan*, *Gorilla*, *Hylobates*, and habitually shod and unshod humans. The hypothesis cannot be falsified. A. L. 333-160 has a flat articular surface that is indistinguishable from unshod humans and is similar to OH 8 (*H. habilis*) and StW 628 (possibly *Au. africanus*). The surface shapes represented by these fossils are all consistent with a rigid lateral midfoot. Articular surface size is significantly different between all groups except the unshod human group and *Pan*. Regression analysis revealed no significant relationship between size and shape for PC 1, which is the most important axis for distinguishing the shape differences between humans and apes. There is a significant relationship between size and shape on the PC 2 axis. This axis shows that *Hylobates* has extreme proximal surface curvature that extends to the dorsal side of the metatarsal. In this sample shod and unshod humans are significantly different in size, and significantly different in shape on the PC 2 axis. Though there is much overlap, some unshod humans have a marginally flatter surface. It is unclear whether this is due to size or being habitually unshod.

Ancient Swahili origins: a mitochondrial study of ancient inhabitants of the Kenyan coast.

LINDSEY G. PROCTOR[1], STEPHANIE MOORMAN[3], KUSIMBA M. CHAPURUKHA[2] and SLOAN R. WILLIAMS[1]. [1]Anthropology, University of Illinois, Chicago, [2]Anthropology, The Field Museum of Natural History, [3]N/A, N/A.

Many scholars have assumed that the ancestors of the Swahili were Bantu-speaking groups who entered East Africa from the west in the closing centuries BCE; however recent archaeological evidence suggests a more complicated situation. Over four field seasons, from 2008 to 2011, thirteen burial tombs were excavated in the cemetery located next to the central mosque at the Swahili site of Mtwapa on the southern coast of Kenya. Men, women and children were buried together in the tombs, and individuals were entombed laying on their right