

coordinates weighted by the singular vectors, supply a useful ordination indicating whether particular dimensions represent ontogeny, phylogeny, or a combination.

Easily generalized for studies involving more than two blocks of landmarks, these singular warp strategies seem especially suited for determining whether the principal dimensions of shape variation among fossils submit to familiar heterochronic explanations.

Natal dispersal of titi monkeys (*Callicebus moloch*) at Cocha Cashu, Manu National Park, Peru.

F. Bossuyt. Graduate Group in Animal Behavior/Dept. of Anthropology, University of California, Davis, Davis, CA, 95616, USA.

Titi monkeys live in monogamous family groups (mean 4.0, range 2 to 7 family members at Cocha Cashu) in small territories (mean 11.5 ha, range 6 to 18 ha), and exhibit both intense paternal care and cooperative alloparental care. This study documented temporal changes in relationships of sub-adults to adult family members and to their natal territories and documented the behavior of sub-adults as they dispersed and acquired territories. Stable groups retained up to 7 members. Low average group size resulted largely from low birth rates (<1.0 per year per group) and high juvenile mortality. Sub-adults dispersed at ages 3 to 4 years or older without obvious social pressure from other group members. Sub-adult males first remain in their natal groups, advertise vocally, and explore nearby mating opportunities. Eventually they may wander away, advertise, and may displace a weakened resident male from his mate. Females appear to disperse and become vagrants earlier than males. Male calls attract them, and they will compete for a mated male that appears ambivalent towards its mate. Sub-adults may delay dispersing because of few mating opportunities, or because they provide critical aid to siblings that are at risk of predation. Sub-adults' aid to sibs may explain both protracted residence in the natal group and absence of pressure from adults for sub-adults to disperse.

Francis Bossuyt tragically disappeared at Cocha Cashu on April 27, 2000. This abstract was prepared from his notes, with great admiration for his exceptional dedication and remarkably rich field research. PSR.

Individuation of human remains from historic cemeteries.

D.C. Boyd, C. Boyd. Radford University, Radford, Virginia, 24142, USA.

A current phenomenon in applied physical anthropology is the legal (contract-

driven) archaeological exhumation and analysis of historic cemeteries, often with significant descendant involvement. Physical anthropologists are routinely being solicited to provide precise identification of exhumed ancestors by their descendants.

A comparison of three recently completed historic cemetery projects in Virginia (Jones, Marshall Tract and West cemeteries) illustrates complexities in the integration of skeletal biological, forensic and historic data in the identification of interred individuals. Three Anglo-American cemeteries dating from the late 17th to the late 19th centuries in eastern Virginia contained a total of 52 individuals; a major goal of these projects was to link recovered human remains with the names of individuals that historic records and oral history indicated were buried at these sites. Poor bone preservation limited the range of forensic identification methods which could be used. Concordance of genealogical and skeletal data, however, led to the individuation of at least 9 of these individuals from the Jones cemetery. Identification of one individual at the Marshall Tract Burial Ground permitted demographic assessment of others through seriation of dental wear. Finally, at the West family cemetery in Alexandria, no positive individuation could occur in spite of detailed information from descendants. These cases illustrate how variability in preservation, contextual integrity, and quality of historic and skeletal data can affect efforts at individuation.

Human evolution: a Neanderthal skeleton in a sapiens closet.

C.L. Brace¹, N. Seguchi¹, C. Quintyn². ¹Museum of Anthropology, University of Michigan, Ann Arbor, 48109, Ann Arbor, MI, 48109, USA, ²Central Identification Laboratory, 310 Worcester Avenue Bldg 45, Hickam Air Force Base, Honolulu, Hawaii 96853-5530.

The press and the profession speak of the "extinction" of European Neanderthals and the immigration of "modern" humans as though they were givens. The categorical typological distinction and the suddenness of "replacement" are assumed without any attempt at documentation. Use of the available data demonstrates a very different picture. Cranial contours of living Europeans, early "moderns" and "classic" Neanderthals demonstrate that the main proportions of the skull are identical.

The obvious difference is in the facial skeleton when individuals such as La Ferrassie I, Predmosti 3 and a recent European male are superimposed. This is reinforced by a comparison of the dental dimensions of "Classic" Neanderthals, Early "moderns" and living Europeans. The re-

gression line slope does not change from the Early Neanderthals until the end of the Pleistocene. The change from Late Neanderthal to Early "modern" is so gradual that there is no way to tell the difference between them.

Published assessments of the archaeological record from Europe to Siberia document the view that the Upper Paleolithic develops *in situ* from the Mousterian. This also documents the nature of the selective force change that produced "modern" human form in place without needing to postulate migration from "elsewhere."

The persisting enthusiasm for Neanderthal "extinction" and "replacement" is a reflection of the lingering reluctance of paleoanthropology to accept the basic outlook of evolutionary biology.

Comparative analyses of genetic social structure in wild gorillas (*Gorilla gorilla*) using DNA from feces and hair.

B.J. Bradley¹, D. Doran², M.M. Robbins³, E. Williamson⁴, C. Boesch³, L. Vigilant³. ¹Anthropological Sciences, SUNY at Stony Brook, Max Planck Institute for Evolutionary Anthropology, Leipzig, Leipzig, D-04103, Germany, ²Anthropological Sciences, SUNY at Stony Brook, ³Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany, ⁴Dian Fossey Gorilla Fund International, PO Box 1321, Kigali, Rwanda.

Genetic analysis provides a powerful means to examine whether ecological differences observed between mountain (*G. g. beringei*) and western lowland (*G. g. gorilla*) gorillas correspond to differences in genetic social structure (e.g. inter-individual relatedness, dispersal patterns, mating success). We are employing DNA analysis within a comparative framework to evaluate the extent to which group males monopolize reproduction of group females as well as to investigate the degree of relatedness between adults in social groups. Hair and fecal samples were collected from some 90 individually recognized mountain gorillas at Karisoke Research Center, Rwanda for which long-term behavioral data have been collected, and from approximately 75 unhabituated western lowland gorillas at Mondika Research Center on the border of Central African Republic and Republic of Congo (Brazzaville). DNA extracted from the noninvasive samples was genotyped using a set of 10 microsatellite loci, resulting in a unique genetic profile for each individual (Probability of individual identity >0.99). These loci exhibit a sufficient amount of variability in both populations for statistically significant determinations of paternity (P>0.95) and accurate assessment of genetic relatedness among individuals. Preliminary results reveal a high degree of reproductive skew

among gorilla males of both subspecies, although western gorilla males are apparently able to monopolize group reproduction to a greater degree than mountain gorillas. These results, however, need to be evaluated within the context of demographic differences between the subspecies as well as differences in male-male relatedness within groups.

New human and chimpanzees models to interpret early hominid dental development.

J. Braga. Université Bordeaux 1, Laboratoire d'Anthropologie, Talence Cedex, France, 33405, France.

Development patterns of permanent teeth of 26 Plio-Pleistocene hominids, mainly from South Africa (N = 18), are re-examined using simulated sampling distributions of Bayesian posterior probabilities and biological models not investigated so far. In this approach, 3584 posterior probabilities can be theoretically calculated to assess the overall dental development pattern represented in a sample. The prior probabilities are chosen to be similar between all the samples in order to allow direct comparisons of posterior probabilities. A comparison is made between: (1) the two genetically distinct chimpanzee species (*Pan troglodytes* and *Pan paniscus*); (2) two non-European extant human samples from Iran and Ivory Coast; (3) extant humans and chimpanzees; (4) extant species and fossil taxa. It is concluded that the chimpanzees and human dental development patterns are highly polymorphic and overlap, even for some features classically considered as distinct. If we consider some of these features (for example canine delay vs. incisors, premolars and second permanent molars), it may be sometimes (i.e., for some comparisons) difficult to contrast developmental patterns because the polymorphism observed among extant humans or early hominids can be accommodated within the one seen among chimpanzees. Moreover, the simulations show that only a limited number of fossil specimens (mainly from Swartkrans) offer the possibility of observing dental development patterns distinctive between *A. (P.) robustus* and *A. africanus*. When removing these specimens from the samples to be compared, the posterior probabilities are often very close, if not identical.

Skeletal pathologies associated with pellagra mortality: implications for interpreting the paleopathology of maize-dependent populations.

B. Brenton¹, P. Robert². ¹Dept of Soc/Anth, St. John's University, Jamaica, NY, 11439, U.S.A., ²Texas Tech U.

This presentation reports on an analysis of skeletal pathologies from 15 individuals known to have died from pellagra. These pellagrins are part of the extensive "Raymond Dart" skeletal collection, housed at the University of Witwatersrand Medical School, Johannesburg, South Africa. The collection provides an unique research opportunity. Most of the individuals have been autopsied and a biological profile including age, sex, height, weight, ethnicity, and cause of death is available for them.

Pellagra, a niacin deficiency disease, is most often associated with high-maize/low protein diets. The sample was drawn from a Black South African population who became increasingly dependent on maize during the 20th century. These pellagrins were found to exhibit considerable periostitic lesions of the lower limbs, and showed a high incidence of alveolar bone loss and dental caries. This corresponds to regions where soft tissue is known to be affected by pellagra. The following pathologies were also noted in some individuals: osteomyelitis, cribra orbitalia, cranial pitting, and enamel hypoplasias.

These findings offer new insights into skeletal-based interpretations of nutrition-related health problems, and for the paleopathology of maize dependent prehistoric and historic populations. Future research for this group will include the histological examination of ribs to determine microstructural patterns specific to pellagra victims.

This research was supported in part by a St. John's University Faculty Seed Grant and a Texas Tech University Faculty Research Travel Grant.

Childhood developmental trajectory of attention and impulse control.

A. Brewis¹, K. Schmidt². ¹University of Georgia, Athens, GA, 30602-1619, USA, ²University of Pittsburgh.

The maturation lag model of attention and impulse control development in boys and girls explains inattention and impulsivity in Attention Deficit Hyperactivity Disorder (ADHD) as delayed development along a normal developmental trajectory. The concept of a cross-culturally uniform developmental trajectory is tested by a comparison of the performance of 212 Mexican school children on the Test of Variable Attention (TOVA) with the performance of populations previously studied. An observed pattern of decreasing errors of omission (indicating improving attention) with increasing age did confirm the predictions of the existing developmental trajectory model, although the shape of this change was linear rather than curvilinear. A predicted age-related decrease

in errors of commission (indicating improving impulse control) was not observed. Gender differences in attention and impulse control measures among Mexican children, ages 6-12 years, were not significant, in contrast to the findings of previous US studies. Mexican children made significantly more errors of omission and commission than American children, indicating greater degrees of characteristic inattentive and impulsive behaviors in childhood. These results indicate that the assumption of a uniform developmental trajectory of these behaviors should be carefully considered before it is applied to understanding children's behavior in culturally diverse settings.

Asymmetry of the frontal endocranium in modern humans: Implications for interpretation of fossil endocasts.

D. Broadfield¹, R.L. Holloway². ¹Dept. of Anthropology, Florida Atlantic University, Boca Raton, FL, 33431, USA, ²Dept. of Anthropology, Columbia University.

A hallmark of the modern human brain is physical asymmetry of the cerebral cortex. In addition, these morphological asymmetries have been implicated in the functional lateralization of cognitive processes. While endocasts do not present direct evidence of the lateralization of cerebral function, they do provide physical evidence indicating aspects of brain size and asymmetry. One area of interest is the frontal region, since it is this area that has been implicated in language functions. While it is not prudent to assign cognitive ability to features of endocasts, it is possible to determine anatomic asymmetries in them.

In a preliminary study we demonstrated the relationship between endocranial asymmetries and cerebral asymmetries (Broadfield et al., 2001). In order to elucidate the relationship between frontal petalial patterns and asymmetries in frontal features such as the orbital or Brocas cap, we examined the presence and degree of asymmetry of these features in modern human skulls that possess a left occipital right frontal petalial pattern (n = 28).

Preliminary analysis suggests that 90% of the individuals in this sample exhibit asymmetry in the frontal region and orbital cap. While this information does not unequivocally demonstrate lateralization of cognitive functions such as language in the individuals sampled, it does provide provocative evidence for interpreting the fossil record. If asymmetry in endocranial features is present in a group that exhibits lateralization of cognitive function such as modern humans, then one can postulate that other hominin groups that demonstrate similar asymmetries may have exhibited lateralization of cerebral functions.