

use of supplemental calcium, diet (e.g., milk, meat, coffee), smoking habits, occupation, household and leisure activities. The physiology of bone loss will be discussed in relation to the musculoskeletal pain associated with the menopausal transition.

DNA evidence for our place in a phylogenetic taxonomy of primates

M. GOODMAN. Department of Anatomy and Cell Biology, Wayne State University School of Medicine, Detroit, MI 48201.

Molecular phylogenetics, a coupling of molecular biology to Hennig's phylogenetic systematics, is bringing about a twofold shift in paradigms, one in systematics and the other in how we view our place in nature. The new paradigm in systematics disbands the traditional use of taxonomic grades with their polyphyletic and paraphyletic taxa and, instead, as proposed by Hennig, favors strictly genealogical (i.e. cladistic) classifications in which all taxa are monophyletic and are arranged in a hierarchical scheme that reflects the time course of phylogeny. The second new paradigm rejects the traditional anthropological view that we humans are greatly different from all other animal species and instead emphasizes how much we hold in common with other species, such as with our closest living relatives, the common and bonobo chimpanzees with whom we share more than 98.3% identity in typical noncoding DNA and probably more than 99.5% identity in the active coding sequences of functional nuclear genes. Phylogenetic analysis of noncoding DNA orthologues, with their accumulation of selectively-neutral changes, depicts chimpanzees as the sister-group of humans in a highly resolved phylogenetic tree of primates that overall is congruent with the extant and fossil osteological evidence on primate phylogeny. The primate classification based on these results places all living apes and humans in subfamily Homininae. In turn at about 18 Ma Homininae divided into Hylobatini (common and siamang gibbons) and Hominini, the latter at about 14 Ma into Pongina for *Pongo* (orangutans) and Hominina for *Gorilla* and *Homo*. *Homo* itself at <6 Ma divided into the subgenera *H. (Homo)* for humans and *H. (Pan)* for common and pygmy chimpanzees. Even on disbanding *Australopithecus* and *Ardipithecus* by placing their species into *Homo (Homo)*, the presumed genealogical relationships of these extinct species to each other and to living humans can be depicted by how the species are listed and identified under the subgenus rank. Clearly this classification argues for having the larger brain *Homo* fossils in a single species.

Sexual size dimorphism in primates: Consideration of relative variation between sexes.

A.D. GORDON. Department of Anthropology, University of Texas, Austin, TX 78712-1086.*

Quantitative genetic models have proven useful in generating predictions for evolution of sexual size dimorphism. However, studies on non-primate taxa in recent years have cast doubt on the descriptive power of these models. Also, quantitative genetic models that assume that individual additive genetic effects have constant magnitudes in both sexes ignore implications of differences in growth trajectories of males and females for the magnitude of additive genetic effects on phenotype. Additive genes may affect growth trajectories as well structural proteins in primate species, in which case addition of one additive unit will have a proportionally larger effect on phenotypic body size at larger sizes than at smaller sizes for a given species.

A new set of descriptive models for the evolution of sexual size dimorphism is proposed. In these models additive genetic effects are assumed to have an additive effect that is proportional to sex-specific body size, rather than a constant additive effect. This assumption is consistent with processes which extend or accelerate growth in one sex relative to the other.

Preliminary models based on selection dimorphism, variance dimorphism, and a combination of the two are outlined. Predictions based on each of these models are presented for the degree of relative variation between male and female body size in sexually dimorphic species.

Predictions were tested based on data collected from three African primates: *Gorilla gorilla*, *Pan troglodytes*, and *Papio cynocephalus*. Body sizes were calculated using geometric means of linear measures of multiple regions of the postcrania for each species. Modified Fligner-Killeen tests were used to compare the relative variation present in male and female body size distributions for each species.

Results from these three species are consistent with the proposed selection dimorphism and combined variance dimorphism/selection dimorphism models. These results are not consistent with the proposed variance dimorphism model. This first step introduces a promising avenue of research into the evolution of sexual size dimorphism in primates.

Supported by a Liberal Arts Graduate Research Fellowship from the University of Texas at Austin.

Analysis of a 13-year demographic study on ringtailed lemurs at the Beza-Mahafaly Reserve, Madagascar.

L. GOULD¹, R.W. SUSSMAN². ¹University

of Victoria, Canada, V8W-3P5, ²Washington University, St. Louis, 63130.

Over the past few decades, long-term demographic studies of both strepsirhine and haplorhine primates in their natural habitats have provided us with valuable information on population stability and life-history variables such as life-spans, mortality, natality, dispersal patterns, and the effect of the environment on these variables. Over a period of 13 years (1987-2000) we collected census data on a population of individually identified (collared and tagged) ringtailed lemurs at the Beza-Mahafaly Reserve, Madagascar. A significant difference was found in population size over the 13-year period, likely related to recurring droughts in this area. Group sizes have ranged from 3 to 15 adults plus immatures. Overall average female to male sex ratio is 1.12:1. In 2000, 3 of the originally collared females still survive, aged 15 (n=2) and at least 16 (n=1), although the majority of collared females died before reaching this age. Male longevity is more difficult to determine, since males in this population occasionally disperse to groups outside the reserve; however none of the 63 males collared between 1987-1990 still exist in the reserve, and only 3/18 collared in 1995 (last collaring season) still reside in the population, compared with 13/72 females collared between 1987-1990 and in 1995. This suggests that males may have shorter life spans, which may be related to female priority of access to resources and extreme seasonal fluctuation in food availability. One group, living in the drier western part of the reserve, fissioned 3 times in the 11 year period and 3 of the original groups no longer exist. This study provides the first information on probable life-span of female ringtailed lemurs, and the fate of males in the wild, and also contributes to our knowledge of environmental effects on primate populations over time.

Seasonal variation in the diet of *Haplemur griseus griseus*.

C. GRASSI. The University of Texas-Austin.

In this study I evaluated seasonal influences on the diet of *H. griseus* at Ranomafana National Park in Southeastern Madagascar. The two main study areas within the park differ in altitude, degree of habitat disturbance, forest composition, and primate fauna. For one year I studied three groups of *H. griseus*: two at a site with less habitat disturbance, Vato, and one at Tala, a more disturbed site. Three distinct climatic seasons were identified: rainy (Dec.-Apr.), cool-dry (May-Aug.) and dry (Sept.-Nov.). Food availability (FA) was calculated based on monthly monitoring of botanical plots in the home ranges of each group. I examined seasonal