p=.003). Scaling differences also exist between locomotor-based groups.

The importance of individually examining each long bone is discussed with respect to scaling analyses of functionally-defined groups. Functional implications of scaling patterns among mammalian groups are presented.

This research was supported by the National Science Foundation (DBS 9211930), Northwestern University Graduate School, and a Sigma Xi grant in aid of research.

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Brain size scaling and body composition in mammals: Implications for the sex difference in brain size in *Homo sapiens*. P. THOMAS SCHOENEMANN, Department of Anthropology, University of California, Berkeley 94720

It is well known that brain size scales with body size across large groups of animals, but body size might simply be a proxy for some more important underlying variable. Given that muscle tissue is more intimately associated with brain function than is adipose tissue, it is possible that some estimate of 'fat-free' weight would be a more appropriate scaling parameter for comparing brain size. The possibility that brain size scales more closely with 'fat-free' weight than with total body weight was tested comparatively using Pitts and Bullard's (1968) data, which includes body composition and organ weight data on 49 species in 11 different orders of mammals. Applying Felsenstein's independent comparisons method (limiting possible statistical biasing effects due to phylogeny) indicates that brain size consistently correlates more highly with 'fat-free' weight than it does with 'fat' weight.

This has potentially important implications for the average sex difference in brain size in humans. A difference approaching 1 standard deviation (about 135 g) in brain size has been found in large cadaver studies, as well as numerous studies using cranial capacity as a surrogate variable for brain size. About 100 g of this difference remains even after correcting for total body size. However, correcting for total body size *does not* correct for sex differences in lean body mass, and this may explain the brain size difference. Females typically average something close to 30% body fat, compared to approximately 15% for males. A survey of the literature on body composition indicates that males and females differ by only ~1.5 standard deviations in total weight on average, but differ between 3 and 4 standard deviations in fat-free weight (determined via hydrostatic weighing).

While there are apparently no studies in humans of the correlation between brain size itself and 'fat-free' weight, two studies were found that report correlations between head circumference and 'fat-free' weight. Both studies found significantly larger correlations than have been found between head circumference and body weight. Given: 1) the sex difference in lean body mass and 2) the correlation between head circumference and 'fat-free' weight, much of the sex difference in head circumference in these two samples may be explained by sex differences in the amount of 'fat-free' weight. Suggestions for future research on this issue will be discussed.

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Terrible teens: the use of adolescent morphology in the interpretation of upper Pleistocene human evolution. J. L. THOMPSON, Scarborough Campus, University of Toronto, Toronto, Canada, M1C 1A4.

The morphology of immature fossil individuals has been used to make inferences about the behaviour and phylogenetic relationships of upper Pleistocene hominids. However, paleoanthropologists are aware that some of the diagnostic features of Neanderthals, for instance, are ones that change during the growth period (eg. supraorbital torus development; presence of retromolar space). Many features are necessarily ontogenetically variable and interpretations of the developmental pattern of these depend crucially upon the individual age assigned to particular specimens. Possible sex differences in growth patterns may also underlie aspects of Neanderthal variability and influence our interpretations of the behavioural significance of morphological characters. Because of this, it is important to point out the implications the age at death estimate of an individual has on our behavioural and phylogenetic interpretations of this and other species. Using the adolescent skull of Le Moustier as a case study, this paper will focus on the several ways in which the morphology of this skull can be interpreted depending on the age one assigns this specimen.

The adolescent specimen of Le Moustier is important because it is one of the few relatively complete adolescent Neanderthals yet recovered. Age at death estimates span from as young as 13 years to as much as 18 years of age. If this specimen was 13 when it died then certain diagnostic aspects of its morphology are likely "underdeveloped" due to its immaturity and we can posit that these features would have had several years to reach their adult size and shape. However, a virtually adult age at death raises the question of why these characters are not fully developed and the answer to this question has both behavioural and phylogenetic implications. A reassessment of the age at death was made based on dental development and this result was used to assess the role of the Le Moustier adolescent in the interpretation of upper Pleistocene human evolution.

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Developmental state and body composition in lemurs and bushbabies. C. D. TILDEN, Duke University, Durham, NC 27705, L. JAYAWICKRAMA, National Zoological Park, Washington, DC 20008, and O. T. OFTEDAL, National Zoological Park, Washington, DC 20008.

It is commonly accepted that the chemical composition of the newborn mammal is related to the infant's state of physiological development. In species that are considered precocial, neonates generally have higher whole body concentrations of dry matter (DM), fat, calcium (Ca), and phosphorus (P), higher ratios of protein to lean body mass (LBM), and lower concentrations of sodium (Na) than do those mammals considered to be altricial. To assess this relationship in prosimian primates, the chemical composition of neonates of three species of lemurs (*Lemur catta*, *Eulemur fulvus*, and *E. macaco*) and two species of bushbabies (*Otolemur crassicaudatus* and *O. garnettii*) was determined by standard methods.

Bushbabies uniformly exhibit higher DM and fat concentrations, higher protein:LBM ratios, and lower Na concentrations than lemurs, suggesting they are more precocial. However, Ca and P are lower in bushbabies than lemurs. We suggest that