

Since the foot performs a pivotal role in the interaction between body movements and substrate condition during locomotion, its form and motion should be closely related to the habitat in which the animal lives. In this study, we measured foot movements in detail in a gibbon (*Hyllobates lar*), a spider monkey (*Ateles geoffroyi*), and two Japanese macaques (*Macaca fuscata*) to obtain quantitative information about terrestrial or arboreal adaptation of foot kinematics in these species. Measurements were made using a 3-D video-based motion analyzer (ELITE, BTS) while the subjects walked on the ground or on a horizontal pole (diameter: 9 cm). The features that characterized the foot kinematics of the gibbon and spider monkey were a relatively plantar-flexed tarsometatarsal joint, a small range of motion of this joint, and an out-toed foot position. By contrast, the tarsometatarsal joint of the Japanese macaques was dorsiflexed during terrestrial walking. This may be related to the digitigrade-like walking of this species. During arboreal walking, however, the foot kinematics of the Japanese macaque were similar to those of the two arboreal species. This supports the hypothesis that the above-mentioned characteristics (plantar-flexed position and small range of motion at the tarsometatarsal joint, out-toed foot) are all related to branch grasping by the foot during arboreal locomotion. The spider monkey and gibbon, which are highly adapted to arboreal life, retain those characteristics when walking terrestrially, whereas the foot of the Japanese macaque seems to be designed to deal with both terrestrial and arboreal substrates.

The relationship between size and shape in baboon molars.

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For almost a century paleoanthropologists have studied the complex relationship between size and shape, allometry. Recent developmental genetic experiments are making the first steps in its clarification. We investigated the relationship between size and shape in baboon molars ($n > 230$). The orientations of the mesial and distal lophs were measured as angles from the perpendicular mesiodistal axis of the tooth for RM₁, LM₁, and RM₁¹. The coefficient of variation (CV) for these angles centers on 3 in this population. This is low compared to the CV for size measurements, which range between 5 and 6. We then tested for correlations between the mesial and

distal loph angles within the same tooth crown, between teeth on the same tooth row, across the arch, and between arches via Pearson Correlation coefficients. The mesial and distal lophs correlate significantly on all teeth ($p = 0.01$), though the maxillary correlation is higher than for the mandible. The mesial and distal lophs are correlated across the mandibular arch (mesial = 0.42, distal = 0.51, $p=0.01$). Only the mesial loph orientation is correlated between the maxillary and mandibular arches (0.23, $p = 0.01$). The correlations between loph angles and standard size metrics are low (< 0.24) or insignificant.

These results have important implications for understanding the sources of variance underlying the cusp positioning of molar crowns. The varying levels of correlation potentially indicate different levels of shared genetic and nongenetic effects in the patterning mechanism. Evolutionary implications will be discussed.

The tale that tail bones tell about the antiquity of the human disease brucellosis.

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Brucellosis, as a pathogen to humans, is a disease that is caused by three bacteria in the genus *Brucella* and is passed to humans through a variety of intermediate hosts including many animals. *Brucella melitensis* is the species that primarily affects goats, which are thought to be the second oldest domesticated (domesticated ca. 9,000BP), and is passed to humans through the consumption of milk. Today brucellosis is endemic in many Middle Eastern countries, but little is known about the origins of brucellosis as a pathogen to humans or about the dispersal patterns of brucellosis in the past. To better understand these concepts we reviewed clinical literature and observed radiographs of modern cases of brucellosis to determine the skeletal manifestations of the disease. Next we evaluated 184 sacra and 288 innominates for signs of sacroilitis (one manifestation of brucellosis) from five different Middle Eastern human samples. These samples included: two from Egypt (Egypt 12th dynasty 1991-1782 BCE, Egypt 25th dynasty 747-657 BCE), one from Jordan (Bab edh-Dhra 3,150-3,000 BCE), and two from Bahrain island (Bahrain 2,300-2000 BCE, Bahrain 2000-1700 BCE). We then radiographed seven innominates that showed

possible signs of brucellosis. We found that one female out of 19 individuals from the 25th dynastic Egyptian collection has sacroilitis that could have been caused by brucellar infection. This is a prevalence of about 5.2% of Egyptians in this 25th dynasty site and is a rate close to what would be expected in a sample where the disease is endemic.

Craniofacial remodeling during adulthood: The supraorbital region.

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Variation of the supraorbital region has been tied to sex, population, and childhood growth, but few studies have attempted to document changes in this region during adulthood. In this study, we examined the pattern of supraorbital change throughout adulthood in a sample of 110 human crania. Forty-five of the crania were of known age at death and sex. Age at death and sex were osteologically determined for the remainder of the sample. Age at death in the sample ranged from 16 to >70 years. After dividing the sample into 11 age groups, we employed an incremental resampling method (modified from Lee and Wolpoff, in press) to test the following hypotheses: 1) no portion of the supraorbital region changes during adulthood, 2) supraorbital change through adulthood is gradual and is not characterized by any spurts, and 3) males and females do not differ in their pattern of adulthood supraorbital change.

Our results falsify the hypothesis of no supraorbital change during adulthood. Lateral and midorbit supraorbital thickness increases significantly with age ($p < 0.05$). Our results also show that supraorbital change during adulthood is, for the most part, not gradual. The most significant changes occur between the twenties and thirties and between the fifties and sixties. Finally, males and females exhibit significantly different patterns of adulthood supraorbital change. Females only exhibit significant change during from the forties to the sixties, while males exhibited significant change only from the twenties to the thirties.

Fruits, fingers, and form: Functional significance of Meissner's corpuscles.

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