The broad-spatial-temporal coverage of the 12,000 European skeletons studied so far by the Global History of Health Project members provides an unprecedented opportunity to study infectious diseases that have shaped European population history. Of the infectious diseases with a known pathogen cause that leave skeletal changes, tuberculosis, leprosy, and treponematosis, have been the most important in shaping the health-history of Europe.

Their differential diagnosis can be problematic and only small proportion of people will have bone changes that the lesion characteristics and their distribution can be pathognomonic. Tuberculosis primarily produces lytic vertebral lesions and non-specific pleural-surface proliferative rib lesions. Depending on the immune response, leprosy is associated with distinct rounding and atrophy of the skull's rhinomaxillary region, and infection/resorption of hand and foot bones. The most important treponemal diseases in Europe were venereal and endemic syphilis. Both produce proliferative subperiosteal response, especially in the tibia, but a characteristic of venereal syphilis can be cranial and rhinomaxillary lesions.

The project identified lesions suggestive of tuberculosis in 1.1% of individuals with observable vertebral (n=6,563). Such lesions are more common during Classical Antiquity (CA) and the Early Middle Ages than during the High Middle Ages (HMA); rib lesions were more common in the Late Middle Ages and CA. Clear signs of leprosy (0.17% n=6,857) and treponemal disease (0.15% n=7,732) are uncommon in the leprosy cases (73%) and treponematosis date to the Early and High Middle Ages. All of the probable treponemal disease cases are confined to the HMA or later.

Research supported by the U.S. National Science Foundation through grants BCS-0527658, SES-0138129, and BCS-0117958.

Parties in the rainforest: Subgroup size and composition of black-handed spider monkeys at a wet site in Costa Rica.

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In a fission-fusion social organization, subgroup size and composition reflect individuals' attempts to optimize both their ecological and social opportunities. Such patterns may differ widely across different habitats that vary in resource availability, predation pressure, and social dynamics. Here, we present data on spider monkey (Ateles geoffroyi ornatus) subgroup size at El Zota Biological Field Station, a lowland tropical wet site in northeastern Costa Rica. Of the 293 independent encounters, parties ranged in size from one to 10 individuals, and the mean number of independently locomoting individuals (ELI) per subgroup was 2.92 ± 0.10. Males and females ranged in parties that were not significantly different in size (males: 3.45 ± 0.28; females: 3.08 ± 0.11; T = 1.374, df = 92, p = 0.25). Females with infants ranged in significantly larger parties than females without infants (female with infant ILI: 4.07 ± 0.28; female without infant ILI: 2.74 ± 1.0; T = 4.480, df = 73, p < 0.0001), a finding which differs from findings reported at other sites. Additionally, the mean party size found at El Zota is lower than figures reported for other sites across a variety of habitats. Furthermore, El Zota female males are not more solitary than males and they do not range in significantly smaller parties, contrary to findings at other sites. We suggest that these patterns are a result of specific ecological and social conditions at El Zota, particularly regarding patch size, resource distribution, and threats to infants.

Quantitative genetic analysis of primate cranial morphology: Cayo Santiago and beyond.

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The evolution of cranial capacity is one of the hallmarks of primate and human evolution. Collections of crania of known individuals with known genealogical relationships are relatively rare. The collection of animals from the rhesus macaque population on Cayo Santiago is the primary such collection available with known maternities. A second collection of crania from the Southwest Foundation for Biomedical Research (SFBR) baboon colony has been recently prepared and curated providing a comparative sample of closely related primate species. Cranial capacity was measured in 500 Cayo macaques using mustard seed and a graduated cylinder and in 600 SFBR baboons using volume reconstructions of CT scans. Linear measurements were collected with a caliper in the Cayo macaques and calculated from 3D coordinates recorded from CT scans and a 3D digitizer in the SFBR baboons. The heritability of cranial capacity is relatively high in both papionin populations (0.60-0.70). Genetic correlations between cranial capacity and cranialial measurements highlight the relationship between brain size and the size and shape of the cranial vault.

We acknowledge support from NSF grant BCS-0725068 and the Genomics of Cranial Morphology Project.

A human mandible BH-1 from the Pleistocene deposits of the Mala Balanica cave (Slićevo gorge, Serbia).

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The status of Neandertals as a species of Homo or a subspecies of H. sapiens dominates the scientific debate on human evolution in the European context. Recent introduction of several new species of Homo and renewed use of H. heidelbergensis implies a species status for Neandertals. The other view, which gives Neandertals a subspecies status, requires that both the Neandertals and these groups, however, be included into archaic sapiens forms. In either case, multiple (at minimum two) migrations into Europe are required to account for either of the models. Reconstructing human evolution in the regional European context becomes inseparable from understanding the migration of early hominins into the area and their later migratory movements into and out of Europe. The most likely corridor – the Southeastern Europe – has a limited Palaeolithic research history and few fossil finds. In this context, a recent find of a human mandible from the Mala Balanica cave described in this paper – the first substantially preserved fossil specimen in the Central Balkans recovered from an undisturbed context – has a potentially very important place in understanding human evolution in Europe.

The research was supported by the Ministry of Science, Republic of Serbia Research Grant (to DM) and the University of Winnipeg Strategic Research Grant (to MR).

In vivo turnover rates in human bacular dental-microwear.

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Differences in bacular dental-microwear among Pleistocene and Holocene hunter-gatherers, and agro-pastoral populations may provide an important clue to dietary and ecological adaptations that differ between these groups. However, microwear patterns can also be the result of short-term variation in food availability and processing techniques. The microscopic in vivo effects of specific foods and changes in diet over time on the buccal enamel surface remain uncharacterized. The main purposes of this study were to record how short-term changes in the formation rate of bacular-microwear are related to mastication of an abrasive diet and document long-term turnover in microwear.

Five high-resolution replicas were obtained from dental impressions taken on adult volunteers at 7-day intervals, and one follow-up replica obtained 14-15 months later. Buccal enamel surface was examined with a SEM at 100X, and microstratification number and length were measured. During the experiment, volunteers maintained an ad libitum diet prior to the consumption of an induced abrasive diet based.