and (3) comfort. GGNP's forested area offered an opportunity to examine these hypotheses in a unique baboon population. The characteristics of sleeping trees were compared to those of trees along two botanical transects within GGNP. GGNP's baboons preferred certain genera, while avoiding others; three genera (*Erythrophleum, Pseudospondias,* and *Canarium*) accounted for 60.0% of sleeping trees, which exceeds their relative abundance in the botanical transects where they comprised 10.4% of trees. Sleeping tree diameter at breast height was twice that of transect trees (DBH: 53.70±19.41cm vs. 24.33±15.87cm; Welch's t=20.03, df=254,305, p<0.001) and also had a greater number of canopy connections (median=6 vs. 3 connections; X^2=81.39, df=1, p<0.001). Of 42 sleeping trees, only four were reused, possibly reducing parasite exposure associated with the accumulation of fecal matter at sleeping sites. Individuals slept at horizontally oriented Y-shaped branch structures more frequently than other branch structures (53% of observations). Our results indicate that GGNP's baboons did not randomly select sleeping trees, instead preferring large trees that may be challenging for predators to enter and that offer a possible escape route via multiple canopy connections, trees where parasite infection risk is low, and sleep structures that provide comfort.

Co-evolution of host and pathogen in three major human infections: a paleopathological perspective

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Pathogens can either kill the host quickly therefore damning its own spread or they can invade the host without causing death, thus ensuring their own survival, reproduction and spread. Tuberculosis, leprosy and treponematoses are three widespread infectious diseases that do not kill the host immediately. A co-evolution of the host and the pathogen has likely occurred in their history. Paleopathological records of the three diseases are extensive, spanning some 200 human generations. The paleopathological prevalence of each disease has been well documented in the form of published compilations recording each known case. We have re-analysed the data from these compilations to test whether changes in the prevalence of each disease over time indicate the co-evolution of the pathogen and human host. Prevalence of each of the three diseases showed a significant trend over time (Chi-squared, p<0.001). Overall, there was a decline in the prevalence of each disease over time. A trend started with the increase in the disease's prevalence and then the prevalence of the disease declined; this is best demonstrated in the case of leprosy. The increase of the prevalence of the disease appears in the initial period of host-disease contact when the co-adaptation has not yet occurred, it is followed by a decline resulting from co-adaptation that is mutually beneficial for the spread and maintenance of the pathogen and the host that, as a result, suffers less pathological reactions to the infection. Eventually, either the host becomes immune, or the pathogen tends to become commensalic rather than parasitic.

Predominant collagen fiber orientation (CFO) is a stronger predictor of load history than drifting osteon prevalence or osteon population density (OPD of conventional osteons): An evaluation in bending regions of adult human fibulae, femora, and chimpanzee femora

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Drifting osteons (DOs) might be extreme manifestations of how osteons influence toughness by introducing interfaces and collagen/lamellar patterns that arrest/slow microdamage propagation. Studies of DOs along with OPD, CFO, and their direction of transverse drift (DTD) can advance understanding of DO biomechanics and help determine if regional variations in their prevalence are useful for interpreting load history. We examined diaphyseal cortices of adult fibulae (AAPA meeting 2016, n=11) and drew comparisons with our previously reported data from upper diaphyses of adult chimpanzee and human femora. As in the femora, fibulae were also examined in circularly polarized light for DO prevalence and compared with OPD and CFO data. The posterior and medial quadrants ("compression region") had: (1) more DOs compared to the opposite combined cortices (p=0.002), resembling chimpanzee femur data but opposite of results in human femora; (2) a trend (p=0.08) in more oblique-to-transverse CFO (previously reported) resembling the significant tension vs. compression differences in chimpanzee/human femora; (3) no trends or statistical significance in OPD data. Fibulae showed weak negative correlation between OPD and DO prevalence (r=-0.35; p<0.001) but no correlations between OPD and CFO (r=0.06; p<0.001), or DOs and CFO (r=0.09; p<0.001). In fibulae, DOs had preferential DTD towards the endosteum (anterior 47%; lateral 70%; posterior 58%; medial: 62%). Lack of preferential DTD in the femora casts doubt that the DTD in fibulae reflects predilection for marrow or low strain. These results show that CFO variations are much stronger correlates than DO prevalence for identifying a bending load history.

Twenty years of ranging patterns in hamadryas baboons: a modern take in a changing climate

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The recent rise in global temperatures has highlighted the importance of long term studies on animal populations that may potentially be adversely affected by climate change. The population of hamadryas baboons at the Filoha outpost of Awash National Park in central Ethiopia has been studied for over 20 years, providing an opportunity to examine the relationship between climatic variation and changes in baboon spatial ecology over time. Additionally, anthropogenic factors such as the expansion of nearby farms and human-wildlife conflict, have played a role in changes in baboon habitat use and movement patterns over time. Here, we examine the effects of both long term climatic changes and anthropogenic factors on the home ranges and daily path lengths of the hamadryas baboon population at Filoha. Starting in 2013, several adult males in this population were outfitted with GPS collars in order to more precisely monitor group movement. Between 1996 and 2006, annual average temperature at Filoha increased by approximately 1.2°C and rainfall increased by approximately 7 mm. The home range size and daily path lengths of our main study group have also increased during this time. We discuss these results in the context of long-term effects of rising global temperatures and anthropogenic activities on this species. Given the notable flexibility and adaptability of baboons – with hamadryas being no exception to this general pattern – our findings have important implications for how animals may adapt and cope in a world affected by climate change.

Cranial variation in the Italian peninsula from the Iron Age to the Middle Ages

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The Italian peninsula is expected to exhibit considerable population variability due to the rise and fall of the Roman Empire, related migrations and trade networks. This research examines changes in cranial shape in Italy beginning in the Iron Age, through Imperial Roman times, and the Middle Ages using four samples (N=142) exhibiting regional and temporal variation. Individuals from Pontecagnano in southern Italy represent