

Evaluating Evidence in Biological Anthropology. The Strange and the Familiar.

Cathy Willermet and Sang-Hee Lee (editors)

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This edited volume is the result of a 2015 session of the American Anthropological Association (AAA) in which scientific approaches to biological anthropology were examined in terms of Familiar/Strange. Methods and models considered “familiar” were rendered “strange,” in order to generate new insights. During the following year, a second session of the AAA meetings explored the discovery of evidence and its interpretation in biological anthropology. The two sections of this book reflect the results of the 2015 and 2016 meetings.

Khorasani and Lee begin the first section by re-examining ideas about the role of women in human evolution, focusing on the notion of a sexual division of labor. They start by reviewing the hunting hypothesis, tracing it back to Darwin in 1871. In this hypothesis, hunting is the main generator of human evolutionary success, and men are the hunters. Female activities are oriented towards gathering, child care, and the invention and transmission of new technologies. Khorasani and Lee then undertake a new review of illustrations and museum dioramas depicting Paleolithic life, following Gifford-Gonzalez’s 1993 study. Using Google’s image search function, they analyze 454 images by gender, body posture, and activities. The results concur with Gifford-Gonzalez’s results of more than 25 years ago. Males are still represented in larger numbers, in a greater array of activities, and are hunters and tool-makers; females take care of children and cook. Finally, Khorasani and Lee address the question of whether women hunt. Using ethnographic evidence, they argue that women hunt when hunting generates more calories per time expended than gathering does.

Glantz examines the Central Asian Paleolithic record, arguing that contemporary sociopolitical influences affect the collection of data, data analysis, and narratives of human evolution. The Central Asian paleoanthropological record is subordinated to the European and Middle Eastern Upper Paleolithic and human fossil finds from East and South Africa. This downplays the uniqueness of the Central Asian record, and its potential to destroy the prevailing Out of Africa picture of modern human origins. Central Asia had variation in climate, archaeology, and fossil human morphology and genetics that indicate it served as a refuge area for multiple human populations. Kissel discusses how popular science explains human origins. He is particularly interested in how non-anthropologists use anthropological data, and how people who accept the existence of evolution deal with the origins of modern humans.

He identifies three areas where ideas about human evolution affect widespread beliefs about human behavior—the use of personal genomic data (available from 23andMe and Ancestry.com) to explain complicated human behavior; that males are innately demonic and warlike; and, that the Western Enlightenment has indisputably improved the world.

Lesnik examines insectivory among the world’s cultures and asks why insects are considered abhorrent food items in Western cultures. Lesnik had previously discovered that there is no relationship between dependence on agriculture and insect consumption, and that insects are not used as a fallback food. The best predictors of insect consumption are poverty and latitude, with latitude being the most important variable. It has a predictive value of 80 percent along a latitudinal gradient. In this chapter, Lesnik re-investigates insect consumption among living humans, using insect taxonomy at the ordinal level. Latitude remains the strongest predictor of insect consumption. There is an inverse correlation between latitude and insect consumption. Because European countries are in high latitudes where insect diversity and abundance are low, this accounts for the historic Western discrimination against this food source.

Nelson discusses how an increased reliance on quantifiable data in biological anthropology is marginalizing qualitative research into human survivorship, health, and reproduction. This created a divergence between biological and cultural anthropology, beginning in the last quarter of the 20th century. Research into human adaptation to extreme environments, especially high-altitude environments, focused on how variability responded to local selection pressures. Recently, the level of study has shifted from the phenotype to the genotype. A subsequent shift towards studying human reproduction emphasized conception, birth, survivorship, and male versus female reproductive strategies. Natural fertility populations (where women use no hormonal contraception) are presumed to reflect the ancestral human condition. Studies of modernization and human health are presumed to reflect current life, and the dynamics of the global marketplace.

In the second part of this book, data and methods are re-evaluated to create novel approaches to evidence. Stodder and Byrnes examine the current explosion in paleopathology being driven by integrating the study of individual specimens into a grand reconstruction of life in the past. They focus on disability, illness, and care. Nonspecific

stress indicators observed in a few individuals can be integrated into a statistically generated picture of population-level health. Culture can act as a stress factor, rather than an environmental buffer. Bioarchaeologists use an Index of Care, where the archaeological context implies the care requirements of individuals with skeletal evidence of disability, and they also examine care across the lifespan. deWitte addresses the Osteological Paradox, which questions the uncritical use of human skeletal assemblages to reconstruct demography and health. How does one develop reasonable inferences from imperfect data? She examines new periosteal bone formation (periostitis) as a result of some factor that causes physiological stress. This allows her to address frailty and differential mortality in human skeletal samples. Skeletal stress markers thus indicate good health, because a human survived a stressor long enough for a lesion to form. Skeletal samples are used from Medieval London (1350–1538 A.D.). High-status people have a significantly greater percentage of healed bony lesions, which implies that they enjoyed better health.

In the longest chapter of the book, Willermet et al. advocate a new solution to issues of data analysis—RED—Rank Estimator of Grade Differences. This new analytic technique is applied to dental morphological traits, most of which are separated into ordinal grade standards, but which are routinely analyzed into dichotomies (present versus absent). RED is a nonparametric rank-based multivariate analysis of variance (MANOVA), modified by an R-written algorithm. Two dental datasets are examined: a simulated one for pre-contact Maya, Aztec, and Totonac samples, and one for European American, African American, and Hispanic American orthodontic collections. RED performs as well or better than traditional biological distance statistics.

Van Arsdale discusses how the use of multivariate techniques over the last 30 years has biased paleoanthropological research towards very well-preserved fossils, leading to a loss of focus on poorly preserved specimens. Quality is emphasized, rather than quantity. Van Arsdale classifies the degree of preservation of 102 fossil human crania published before 1988 using a fragmentation index. He then examines the frequency with which each of these fossils were cited from 1988–2015 in the *American Journal of Physical Anthropology* and the *Journal of Human Evolution*. This period covers the wholesale adoption of multivariate techniques and geometric morphometrics. There is a significant linear relationship between highly preserved fossils and citation frequency, and the average number of citations for the best-preserved specimens is double that of the second-best category. When the citation time frame is subdivided into two 14-year sections, citation frequency increases across the best-preserved category, with the best preserved fossils cited 32 times more frequently from 2009–2015. But fossils like Bilzingsleben and Skhul 9, which are poorly preserved, are disappearing from the published literature. Beasley and Schoeninger use stable isotopes from modern chimpanzee communities to illuminate how hominin paleoenvironments can be reconstructed. Living chimpanzees in a mosaic habitat only feed in areas of dense tree cover. *Australopithecus anamensis* at Kanapoi and Allia Bay could have been feeding in wetter habitats within a more arid region.

In the last chapter, Willermet and Lee present Van Arsdale's data in three tables to demonstrate how the best-preserved hominin fossils are skewed by geographic area, age range, and taxa. Willermet and Lee conclude by arguing that biological anthropology is certainly a subfield of anthropology, but that it requires constant critical scrutiny.