“Probing Human Origins”

Edited by Morris Goodman and Anne Simon Moffat

Executive Summary

“Probing Human Origins” explores, from various perspectives, how humans became human. This collection of papers acknowledges the importance of genetic ‘blueprints’ but rejects the idea that the DNA sequence of the human genome contains a book of instructions that defines being human. Instead, it promotes the idea that during humankind’s evolutionary history, genic changes occurred in ancestral genomes that were positively selected to help shape the distinctive human phenotype. This view complements the idea that our social and physical environments guide how we act. Thus, a major trend in humankind’s evolutionary history has been the selection of genomes that gave their bearers the brain power to use learned, culturally transmitted behaviors to cope successfully with an increasing range of external challenges. Paradoxically, because of humankind’s genetic evolution, the future of the human species now depends most heavily on further cultural-social evolution rather than biological evolution.

The first two papers, one by Gumucio et al. (“Primate Genomics: A Rich Resource for Functional Genomics”) and another by Wildman et al. (“Functional DNA in Humans and Chimpanzees Shows They Are More Similar to Each Other Than Either Is to Other Apes”), illustrate how comparative primate gene studies can help to explain humankind’s evolutionary history. In particular, such research identifies gene changes that are significant and were favored by natural selection. The roles of various genes for globin, a protein responsible for carrying oxygen, are explored in detail. The paper by Potts (“Complexity and Adaptability in Human Evolution”) provides evidence that during the past 4.5 million years of humankind’s history,

changing physical environments selected for genomes that gave human ancestors adaptive versatility to endure increasing environmental instability. He suggests that by finding new ways to measure the variability of physical environments, it may be possible to resolve how some humans evolved. The paper by Richerson and Boyd ("Culture Is Part of Human Biology") offers the idea that the ancestors of modern humans had genomes that gave their bearers the capacity for socially transmitted, nongenetic, learned behaviors, such as culture; however, culture, in turn, favored selection of genomes that further increased the capacity of modern humans to engage in culture. The authors stress that, "Most evolutionary theories of human behavior inspired by Darwin underestimate the importance of culture in the evolution of behavior." The paper by Fouts and Jensvold ("Armchair Delusions Versus Empirical Realities: A Neurological Model for the Continuity of Ape and Human Languaging") calls into question the view that the capacity for language arose *de novo* in a relatively recent, common ancestor of all modern humans. In challenging the popular view that there were no earlier evolutionary predecessors to human language, Fouts and Jensvold offer evidence from sign language studies of chimpanzees and from similarities between humans and chimpanzees in the neocortical structures concerned with language. The common ancestor of humans and chimpanzees, they argue, may well have had the capacity for rudimentary human language.