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From: R. Bruce Hitchner, Editor-in-Chief
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Re: Author's Proofs

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Many thanks.

THE DAWN OF HUMAN CULTURE, by *Richard G. Klein* with *Blake Edgar*. Pp. 288, b&w figs. 52, maps 10. John Wiley & Sons, New York 2002. \$27.95. ISBN 0-471-25252-2.

Writing with Blake Edgar (coauthor of one of the Lucy books), Richard Klein has produced a fine coffee table volume outlining his view of prehistory and his explanations for the pattern of human and archaeological change. Well illustrated with drawings, many by the excellent Kathryn Cruz-Urbe, and with helpful maps, this is arguably the best explanation yet of the Eve hypothesis that modern humans are a new species recently evolved in Africa, who spread around the world and replaced native peoples. It's a tough row to hoe.

If you need to read about the replacement theory, or explain it to friends and neighbors, it's hard to go wrong with this volume. The text is lightly written, difficult concepts are reasonably explained, and a sense of story in the narrative covers up the fact that a good deal of information is spread throughout the writing. I enjoyed reading it, and not just because of the more comic scenes, like the description of the attempt to explain hand axes with a mate selection hypothesis (107)—I never thought I'd feel nostalgia for Frank Livingstone's explanation of hand axes as projectiles—or the attempt to find reasons for the evolution of very large brain size in Neandertals, “that had nothing to do with intelligence or behavioral potential” (179).

The review of human evolution is comprehensive and begins with the australopithecines, their anatomy and bipedalism, and, most importantly for this book, the evidence of their behavior reflected in the archaeological record. This behavioral thread continues, and much of this book, arguably the most interesting part, is archaeological in nature. Yet because sites, tools, and the remains of meals reflect behavior—not necessarily behavioral *potential* (what might a future archaeologist make of 12th-century Tasmanian archaeology?)—the archaeological narrative may not be able to address the final and focal discussion of the Eve theory without making the assumption that there is a link between biology and culture. There is no such link *within* the human species today, and to make this assumption for the past is to imply the corollary that human beings and Neandertals are different hominid species. Make no mistake about this point (the authors certainly do not): if Neandertals are a geographic group within the species *Homo sapiens*, there would be no link between their culture and their biology. Any hypothesis that requires such a link, as the Eve replacement theory expounded in this book does, must contend a species level difference for Neandertals as one of its assumptions.

But what evidence is brought forward to show this? It is not anatomical—Neandertal anatomy is explained by cold adaptation in a culturally challenged population and not by a different phylogeny—nor is it behavioral, since purported “moderns” in Western Asia cannot be meaningfully distinguished from penecontemporary Neandertals by their archaeology and late Neandertals of Europe are associated with the European Upper Paleolithic (al-

though the authors try to make a case for behavioral distinctions based on differing artistic abilities—perhaps they should visit more garage sales). No, the case is based on Neandertal genetics, or more accurately, on the variation in an approximately 300 base pair long segment of a single 16,000 base pair long gene that is inherited outside of the nucleus. This is a weak case, not only because there is only the one gene for analysis, this gene evolves rapidly and has been under selection, and not just the Neandertals (or purported Neandertals) but virtually all fossil remains older than 30,000 years or so have mitochondrial DNA variations that can no longer be found today, but also because Neandertal mtDNA evolution is suspiciously wrong. If Neandertal mtDNA was unique to a separate species evolving in its own direction (as these authors suppose), it should become increasingly different from human mtDNA over time—the more recent the Neandertal sample, the greater the expected difference. But in fact Neandertal mtDNA is more similar to the forms found today in the most recent specimens.

I did not begin this book thinking that Richard Klein had come to take a different position on modern human origins than he has been publishing over the past decades, and in this I was not disappointed. What did surprise me is the increasing certainty that has found its way into the tone of his assertions, the diminishing role for reasonable doubt, and, for the most part, the absence of admission that some of the links in his logic are missing or very weak; these are elements that were an important aspect of his earlier writings. For instance, take the way post-Neandertal specimens from sites such as Lagar Velho and Mladeč are treated (201–4). In both cases the scientists who described the specimens in question provided detailed descriptions and analyses that showed evidence of mixed ancestry, with older Neandertal populations as one of the ancestors, but Klein and Edgar choose to cite brief and misleading commentaries about the specimens that assert that robustness is confused with Neandertal similarities in these analyses. This possibility was explicitly addressed by the describers, and dismissed for good reason. The assertions of robustness rather than ancestry are not presented as the conclusions of questionable critiques by authors who never studied the remains, or as parts of unresolved controversies, as Klein might have done in earlier works, but as incontrovertible facts. But these and other contentions, such as the “well-defined chins like those of living people” (224–5) said to usually characterize African mandibles between 130,000 and 50,000 years ago (half of the Klasies mandibles with the region preserved lack such chins) or the African-like limb proportions said to be found in the Skhul specimens (225), are not facts. The later claim exemplifies the most difficult problem in these assertions, the particular way that the devil resides in the details. Skhul 4 has the limb proportions of Africans in both arm and leg, as Klein and Edgar assert, but Skhul 5 has the limb proportions of cold adapted Neandertals and if the proportions of Skhul 4 denote an African ancestry, as these authors believe, it would be reasonable to also conclude that the proportions of Skhul 5 show a cold-adapted European (e.g., Neandertal) ancestry. But this is a problem, because such

a conclusion would suggest that Late Pleistocene Africans and Europeans were meeting and mixing at Skhul, and this would most certainly undermine the contention that they are different species.

There is a further problem with the theory that forms the core of the explanation in this book. The most fundamental element of science is testability; this is what separates science from all the other ways we attempt to explain our world. There is nothing wrong in suggesting untestable explanations, even if they might not be scientific explanations. But here, these untestable explanations are the basis of what the cover describes as “a bold new theory.” The authors argue that modern humans are the consequence of a “fortuitous mutation that promoted the fully modern human brain” (270). They speculate this “last key neural change promoted the modern capacity for rapidly spoken phonemic language” (271). This explanation may indeed be bold, but it certainly is not new (Grover Krantz proposed the language explanation for modern human origins in 1980), and, because it cannot be tested (by the authors’ own admission), it is wrong to characterize this explanation as a “theory.”

Human culture evolved, in the sense that it changed over time. This evolution reflects genetic changes, among other things, even if the changes were in the genetic basis for behavioral capacities and the structure of how behaviors are related and interpreted, and not directly in any genetic basis for the behaviors themselves (this makes it less likely that evolutionary changes in behavior parallel each other in different human species, as the authors seem to believe). However, when significant cultural manifestations first began is an unanswered question. These authors find evidence for a recent dawning of human culture in the appearance of a new culturally talented species that accidentally benefited from a fortuitous mutation. Other authors believe the evidence points at a very much older dawning of human culture and contend that chimpanzee behaviors reflect the antiquity of this event, in an ancient common ancestry with humans, because chimpanzee behaviors are cultural. I suppose it depends on where you stand (the present looking backwards or the past looking forwards into the future), but I find it unlikely that from her perspective an australopithecine scientist would think of distinguishing the behavior or anatomy of Neandertals from other contemporary human populations in any meaningful way. A theory that must stand or fall on the convincing demonstration of the level of Neandertal distinction and separateness proposed here is a theory in serious trouble. This, however, should not distract the interested from reading about it.

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