The Red Ape: Orangutans and Human Origins by Jeffrey **H.** Schwartz. Cambridge, MA: Westview Press, 2005. $27.50 (cloth). ISBN 0-8133-4064-0.

My first presentation at a professional meeting as a beginning graduate student was a poster entitled *Human-Ape Phylogeny: The Anatomical Evidence,* coauthored with John Fleagle and Arthur Keith (posthumously; Meldrum, Fleagle, & Keith, 1985). The study was motivated as a response to Jeffrey H. Schwartz's *Nature* paper published the previous year, in which he reviewed his controversial theory of human origins, that orangutans are humans' nearest living relative. We drew upon the unpublished manuscript of British anatomist Sir Arthur Keith entitled *Man and Ape,* augmented by contemporary studies of primate anatomy, in order to construct a data set of anatomical characters that we might submit to analysis by the recently innovated Numerical Taxonomy methodology. We wanted to determine whether the conclusions Keith arrived at using longhand tabulations would be borne out by a modern computer algorithm applied to a refined and augmented data set. The matrix was typed into the mainframe computer terminal and we returned later that day for the result. Just as Keith had deduced, the shortest tree arrived at by an admittedly phenetic approach grouped humans as most similar to the gorilla, with the chimpanzees not far beyond, and the orangutan considerably removed. Schwartz seems to refer to this contribution with deference to Fleagle, but neglected to mention the coauthors (p. 208).

Casting a glance even further back in time, I can remember as an undergraduate the excitement over the contention between the nascent molecular anthropology and the time-honored traditions of paleoanthropology, with its implications for understanding the hominid fossil record. It clearly left an impression, because I vividly can recall sitting near the back of a lecture hall distracted by my reading of the news item describing the discovery of the *Sivapithecus* face. With these experiences in mind, reviewing *The Red Ape* has been at once a pleasantly nostalgic historical reminiscence and a frustrating conflation of poorly resolved contemporary ideas. This revised edition remains steeped in the historicity of the subject matter and successfully captures the tensions that accompany successive revisions of long-held ideas, but falls short of providing the reader with a thorough update and the full advantage of a broad current perspective of the issues.

I can appreciate the spirit of Schwartz's challenge of the orthodox position. On the other hand, the assault on the orthodoxy is largely ineffectual; the case made for a unique relation between humans and orangs is weak and ambiguous. There are a number of fundamental shortcomings of the argument. First, intragroup variance is largely trivialized in favor of a strictly typological approach to character analysis. Second, the application of definitions of primitive versus derived states is delivered after a rather convoluted and difficult labor. At one turn the distinctions seem to be completely passed over as similarities between humans and orangs are enumerated. Then in a footnote the

reader is cautioned that "a common tactic used to dismiss someone else's theory of relatedness is to assert that the features that support it either came to resemble each other through independent and parallel evolutionary avenues or are primitive retentions from a distant ancestor" (p. 97). Third, as intimated by the preceding quotation, the role of convergence in evolution is downplayed. This is especially disappointing, because if recent molecular phylogenetics has revealed anything, it has revealed the rampant homoplasy that must be recognized as integral to evolution. This has been freshly and extensively illuminated by Morris (2003) in his treatment of convergence, *Life's Solution.*

Instead the reader is left with a vacuous theory propped up with questionable phenetic similarities, but devoid of any robust testable framework. In this regard I am reminded of the Aquatic Ape hypothesis (Morgan, 1994). Schwartz leaves the reader with a glaring void when it comes to a biogeographical scenario to explain just how orangs and humans might share a recent common ancestor. The only apparent acknowledgement of this lapse is a statement that species of *Australopithecus* in south and east Africa are extinct relatives of orangutans (p. 214). Recent fossil discoveries might lend some plausibility to a needed biogeographical model. However, no mention is made of work such as Chimanee et al. (2003), who note in their description of a new middle Miocene hominoid (cf. *Lufengpithecus chiangmuenensis* n. sp.), considered a possible orang ancestor from the geographic region of Pleistocene orangs, that the associated flora exhibits strong Africa affinities. They proposed a temporary dispersal corridor between Southeast Asia and Africa that they suggest may have played a critical role in hominoid dispersion. Also omitted is an update of the numerous revelations of hominoid and hominid paleontology from China and elsewhere in Asia. The relationships of these new species of hominoids and new occurrences of early members of the genus *Homo* are far from resolved, but they certainly raise intriguing questions concerning the prevailing dogmas about the course of human evolution and provide a basis for the discussion of possible alternate hypotheses.

Evident in the growing body of literature is the lack of consensus and ongoing debate over hominoid character interpretation. Clearly, a definitive phylogeny of Miocene hominoids is not presently attainable. It is apparent that extensive homoplasy characterizes these diverse lineages. If sorting out and identifying the ancestors of the extant great apes poses such a challenge, where is the justification for certainty regarding humans' closet kin, contrary to recent claims that "the unequivocal story of morphological systematics" places orangutans as our nearest living relatives (Grehan, 2005). Far from clear-cut and tidy, Schwartz's character list gives little regard for the prevalence of homoplasy in hominoid evolution.

The *Red Ape* has prompted attention directed to the sometimes marginalized orangutan. It has perhaps focused renewed analyses of phylogenetic relationships among the apes and hominids, which from a morphological perspective is only as good as the character definitions and their descriptions. However, in this

regard it also has obfuscated the situation by oversimplification and generalization of morphological and behavioral characters and overreaching trivialization of DNA sequence data. The message of *The Red Ape* will be productive only in inverse relation to the blind allegiance with which its devotees support it. *The Red Ape* comes close to a case of the pot calling the kettle black.

D. JEFFREY MELDRUM
Dept. of Biological Sciences
Idaho State University
Pocatello, ID 83209

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Lessons from the Living Cell: The Limits of Reductionism by Stephen Rothman. McGraw-Hill, 2002. 272 pp. $24.95 (cloth). ISBN 0-07-137820-0.

This book, written by a veteran cell biologist, addresses the methodology of reductionism in biology. Although the book outlines about a dozen different types of reductionism, the main thrust of this approach is trying to understand a system by breaking it down into the smallest, most fundamental units possible and studying these units and their interactions. The author frames the question as whether a living being can be completely understood through full knowledge about its genome, and throughout the book argues that the answer is no. The genome is a parts list, and although we can certainly learn much from a complete list of the parts of an object to be assembled, it is clear to anyone who has ever bought a do-it-yourself-kit that having the list of components is just the first step in being able to arrive at the finished product. The book is an enjoyable read and a valuable contribution to discussions of methodological and epistemological reductionism, which often focus on cognitive science and philosophy of mind or are written by philosophers with no practical experience in the research field. Here, we find an insider's analysis of reductionism, explored across the backdrop of the details of controversies over protein transport across cell membranes; the book continuously weaves through the details of biology and its methods, a number of personalities involved in various disputes in the field, assumptions vs. interpretations of data, and the author's own involvement in the early stages