Book Review


Reconstruction of phylogenetic relationships among primates remains controversial in many respects, but one conclusion has been almost universally accepted for some time: Extant monkeys, apes and humans, allocated to the suborder Anthropoidea, belong to a monophyletic group derived from a specific common ancestor within the primate tree. Indeed, emergence of that common ancestor was accompanied by development of several undeniably advanced features—notably in the visual system, the brain and the masticatory apparatus—that have collectively justified the label grade shift. In particular, all modern anthropoids exhibit a postorbital septum (unique among mammals), fusion of the mandibular symphysis and of the suture between the frontal bones, and enlargement of the brain accompanied by extensive reduction of the olfactory bulbs. Over recent decades, the conclusion that modern anthropoids constitute a monophyletic group has been abundantly reinforced by molecular evidence, which (in striking contrast to evidence bearing on the relationships of lemurs, lorises and tarsiers) has never yielded any conflicting interpretation. A word of caution is, however, necessary regarding interpretation of the molecular evidence. Because it uniformly indicates that modern anthropoids are monophyletic, there has been a tendency to drift into the assumption that their last common ancestor necessarily possessed the defining features of the modern representatives. Of course, given the widespread occurrence of homoplasy—convergent and parallel evolution—this may not be true. Only meticulous phylogenetic reconstruction with due reference to the fossil record can reveal the morphological and other characters possessed by the last common ancestor of modern anthropoids.

For primatologists, the question of anthropoid origins has understandably been a key issue that has been examined in many individual
publications. Nevertheless, books dealing with anthropoid origins have been surprisingly rare, and the first book specifically focused on the topic—with an emphasis on divergence between platyrrhines and catarrhines—was the volume edited by Ciochon and Chiarelli (1980). Eventually a second landmark edited treatise dealing explicitly with anthropoid origins followed (Fleagle and Kay, 1994). In the decade that has since elapsed, there have been major advances on several fronts, notably with respect to discovery of significant new fossil material and enhanced interpretation of the distinctive morphological features of anthropoids. The time was therefore certainly ripe for another review, and this need is admirably filled by *Anthropoid Origins: New Visions*, an impressive 25-chapter, 750-page volume stemming from a conference with 35 participants held in Powdermill Nature Reserve, Pennsylvania in April 2001.

A major advance in our understanding of anthropoid evolution over the past decade has been the discovery of vital new fossil evidence. In addition to enhancing our knowledge of early anthropoid features, new fossils have expanded the geographical range to firmly embrace Asia and to extend the geological range back to the middle Eocene. Hitherto, knowledge of early anthropoids depended heavily on finds at the late Eocene/early Oligocene Fayum site in Egypt (which have also increased over the past decade) and on a few other discoveries in North Africa, so greatly increased documentation from the Asian arena is very welcome. Three notable Asian discoveries have been *Eosimias* in China (Beard et al., 1994), *Siamopithecus* in Thailand (Chaimanee et al., 1997), and documentation of the new genera *Bahinia* (Jaeger et al., 1999) and *Myanmarpithecus* (Takai et al., 2001) from Myanmar along with more substantial material for the previously poorly known *Amphipithecus* and *Pondaungia*. This wealth of new fossil evidence is effectively reviewed in 10 chapters (40% of the total), which is in itself an invaluable asset of the edited volume. Although controversy remains, through the drifting cloud of cordite a general consensus is emerging with respect to certain basic interpretations. By common consent, *Eosimias* and its relatives, e.g. *Bahinia*, are allocated to the Eosimiidae, while *Amphipithecus*, *Pondaungia* and *Siamopithecus* (with or without *Myanmarpithecus*) are combined in the Amphipithecidae. Both eosimiids (with some reservation) and amphipithecids (with less reservation) can be seen as stem anthropoids (or protoanthropoids) that branched off before the common ancestor of extant anthropoids and their direct relatives: crown anthropoids. This interpretation is reinforced by a formal phylogenetic analysis—the most comprehensive of its kind to date—presented in the chapter by Kay et al. expanding on previously published results (Kay et al., 1997; Ross et al., 1998). It should be noted, however, that a different analysis by Seiffert et al. yields somewhat divergent results. The