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Book Review

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This is 1 of 3 volumes on the selected proceedings of the 10th Congress of the International Primatological Society, held in Nairobi, Kenya, during July 1984. The volume is somewhat inappropriately titled, because the vast majority of papers deal with selected topics on the stratigraphy, morphology, and biomechanical analysis of fossil or extant hominid and hominoid primates. Given the site of the Congress in East Africa, it is perhaps appropriate that the focal point should have been on comparative aspects of hominoid evolution. As is typical of such symposia, the papers vary considerably in quality, and this review will emphasize some of the highlights of the volume.

The contributions are organized into four parts, some of which are only loosely joined by a common theme. The first of these represents a symposium organized by Martin Pickford, entitled: Dating the Fossil Primate Record. This focuses on Old World catarrhine primates, based on a variety of dating methods, such as radioisotopes, paleomagnetic stratigraphy, and biostratigraphy. Fleagle et al. provide an excellent summary of the stratigraphy, paleoenvironment, and mammalian fauna of the Egyptian Fayum, the locality of the earliest unquestioned anthropoid (simiiform) primates. They discuss the difficulties in obtaining precise geological or radiometric evidence for the age of this fauna, and they provide a minimum K-Ar age of 31 million years. Although a maximum age is not available, the Fayum fossil catarrhines appear to be from the early Oligocene, based on geological and paleontological evidence. The authors indicate that both the parapihithacids and pliopithecids of the Fayum lack derived features that would corroborate their earlier suggested affinities with cercopithecoids and hominoids, respectively. Although acknowledging the recent evidence, which suggests that the pliopithecids Aegyptopithecus and Propithecus might have been ancestral to all later catarrhines, the authors paradoxically continue to consider these two genera as 'hominoids'. Fleagle et al. admit that we have no evidence of catarrhine evolution between the Fayum early Oligocene and the early Miocene of East Africa (a gap of more than 10 million years) and that it was during this time that the phyletic divergence of cercopithecoids and hominoids probably occurred.

Pickford summarizes the stratigraphy and radioisotopic dating of cercopithecoids and hominoids from the Miocene of East Africa, ranging from 22.5 to 6 million years. Other contributors to the symposium discuss the chronology of Miocene hominoids in Kenya, Saudi Arabia, Europe, India, and Pakistan and of the Pleistocene Javanese hominids. These are

followed by Pickford's excellent summary of the symposium, in which he points out major gaps in the catarrhine fossil record of Africa, Europe, and Asia. In particular, he proposes that the failure to find hominoid fossils in Europe and Asia prior to the middle Miocene reflects their genuine absence during this period. This can be correlated with cooler temperatures in the northern continents during Oligocene – early Miocene times, and, therefore, with an unsuitable environment for hominoids. Pickford suggests that the subsequent change to a subtropical climate in southern and central Europe and Asia about 15–17 million years ago led to the establishment of a corridor for the passage of hominoids from Africa northward. The second part of the book is devoted to 'issues in higher primate evolution'. This section is introduced by Fleagle's brief overview of selected aspects of early anthropoid evolution in Africa and South America. This is followed by several papers on cranial, dental, and postcranial features of hominoids or hominids (Walker et al., Senut, Pickford, Lucas et al., Marzke) and a single report on the postcranial morphology of a fossil cercopithecoid (Jablonski). This section also contains the single truly comparative study of primate evolutionary morphology found in the volume, that by Tardieu on the knee-joint menisci in a wide range of strepsirrhine and haplorhine primates.

116

Book Review

This part of the volume ends with a general paper on the use of computed tomography scan techniques for the three-dimensional study of cranial morphology in primates and other mammals. Conroy and Vannier emphasize the value of this new methodology for the determination of endocranial shape and volume and for the noninvasive 'removal' of matrix from fossil skulls without damaging them.

The third section of the volume is on 'functional anatomy and evolution', and focuses on the mechanical, allometric, and ontogenetic factors that have influenced shape and change of the skull during primate evolution. Demes et al. demonstrate that changes in shape of the skull among various extant hominoids are correlated with allometric adaptations for maintaining maximum bite force in the masticatory apparatus. It remains a challenge to determine how to incorporate the functional, biomechanical, and allometric data of this and other reports in this section into evaluations of primate phylogeny. In contrast, Schneck and Zeller discuss their observations on cranial morphogenesis in hominoids and tupaiids, respectively, in terms of plesiomorphous or apomorphic features. In particular, Zeller emphasizes that several supposed derived similarities of the skull between tupaiids and primates are not present in the morphotype of tupaiids when ontogenetic evidence from both *Ptilocercus* and *Tupaia* is considered. His observations further weaken the hypothesis of a special phylogenetic relationship between tupaiids and primates.

The final part of the book is a brief section of three papers devoted to 'evolutionary genetics'. This is the weakest segment of the volume, and clearly it does not reflect the considerable advances made in recent decades toward understanding the molecular and genetic aspects of primate evolution.

In summary, this volume will be of greatest interest to those biologists interested in comparative aspects of hominoid evolution and those who wish a brief sampling of some of the multidisciplinary methods currently being used to investigate the evolutionary biology of fossil and extant primates.

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