Book Review

Charles R. Noback (ed.) Sensory Systems of Primates

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In the preface to this book the editor notes that 'The special senses of olfaction, audition, and particularly vision are ... of paramount significance in the evolution and adaptive radiation of primates'. Of the eight chapters presented, one is concerned with the olfactory system, three with the auditory system, and three with the visual system. The final chapter discusses endocast material.

The chapter on olfaction by G. Epplé and D. Moulton examines both the anatomy of the olfactory system and the communicatory functions of olfactory signals. The anatomical discussion provides a brief, but adequate, review of the nasal cavities, main and accessory olfactory epithelia and bulbs, and secondary olfactory connections. The complete absence of anatomical illustrations, however, detracts from the value of this review. The functional discussion is enlightening and presents material on the roles of olfactory cues in communicating such messages as species identity, sexual identity, and emotional and social conditions.

Of the three chapters on the auditory system, the one by L.M. Eisenman on vocal communication comes closest to addressing the particular significance of audition for primates. In this chapter, he discusses the two types of primate vocalizations synthesized by Marler and reviews their ecological and ethological correlates. He also summarizes what is known about auditory cortical unit responses to vocalizations and raises questions concerning the origins of human language.

N. Strominger's review of central auditory connections becomes a bit mired in cytoarchitectonic details which non-neuroanatomists may find difficult to follow. Nevertheless, his summary of auditory nuclei and their connections is good, despite the fact that the sparseness of comparative data on primates forces him to devote much of his text to the auditory system of cats. Virtually no functional correlates are given. The chapter by S.M. Khanna and J. Tonndorf on the ear offers few specifics concerning the importance of this structure to the adaptive radiation of primates. Much of the chapter is concerned with general acoustical phenomena such as noise, filtering, and interference. These subjects have a scope which extends far beyond primate studies. The same may be said of the chapter's major theme: the role of the ear as an early warning device.

The chapter by R.P. Pentney and J.R. Cotter on the structure and functions of the superior colliculus provides an adequate summary of this area. They discuss the laminar organization of the superior colliculus, examining both cytoarchitecture and connections. The lack of good illustrations detracts from their review, e.g., one photograph through the

Book Review

160

colliculi is blurred and out of focus. After summarizing physiological and behavioral studies on the superior colliculus, they arrive at a disappointing conclusion: the superior colliculus does not appear to be essential, but may have subtle influences. The paper by J.T. Weber and J.K. Harting on multiple pathways connecting the superior colliculus with the cerebellar vermis is a sound

study, but seems overly narrow for inclusion in a volume such as this. The last paper on the visual system, J.H. Kaas' chapter on the organization of visual cortex, is the best of the three. It summarizes the evidence against viewing primary and secondary visual cortices as stations in a linear, sequential array, and emphasizes the **inter**connective-ness of the many known visual areas. Kaas' discussion of the evolution of visual cortices likewise emphasizes radiation, rather than progression. Finally, he does an admirable job of presenting a complex set of multiple mappings and his illustrations do much to help the reader.

The last chapter, on the study of endocast material in primates, is refreshing in style and argument. R.L. Holloway points out the many difficulties and pitfalls to such a study (some of which call into question earlier work) and provides some glimpses into his own work in progress. His studies address taxonomic, evolutionary, and adaptive questions, and although inclusion of this material in a book on sensory systems may seem out of place, his willingness to approach these questions easily justifies its presence in the volume.

Overall, the quality of the chapters is mixed. While the editor's preface leads the reader to expect discussion and commentary on the 'paramount significance' of three special senses in primate evolution, few of the authors deliver. Worse, occasional reference to 'sub-primates', and some inappropriate or unjustified use of such terms as 'primitive', 'higher' and 'progressive' suggest that anthropocentrism and the scala naturae live on in the hearts of several authors. Nevertheless, several of the chapters (notably those by Eisenman, Kaas, and Holloway) are truly comparative in their approach and prove well-worth the reader's time and interest.

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