

employed to expand other parts of the book. This aspect of entomology is so involved in the complexities of ecology that a reader of this book would not be adequately informed if he wished to apply the information.

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## A Primate

**The Squirrel Monkey.** LEONARD A. ROSENBLUM and ROBERT W. COOPER, Eds. Academic Press, New York, 1968. xii + 452 pp., illus. \$17.50.

The squirrel monkey, *Saimiri sciureus*, is rapidly becoming a major research animal in laboratories of psychology, neurophysiology, pharmacology, and anatomy, and its usefulness as a biological preparation has probably not yet been fully exploited. The many characteristics which make *Saimiri sciureus* a useful research animal include its relatively small size—a tenth the weight of a rhesus monkey—its near lissencephalic, but clearly primate-type, brain, its adequate and broad, though not spectacular, learning ability, and its ability to adapt successfully to stressful situations. Evidence of this last capability is best indicated by the use of squirrel monkeys in aerospace medical research, as described by Beischer in the book under review.

The usefulness of any primate as a laboratory animal is dependent upon the investigator's ability to control disease, particularly lethal disease, to maintain adequate health with reasonable caretaking and sociological controls, and to establish breeding colonies with high productivity, time-dated pregnancies, and low mortality. The problems, perils, and progress in the acquisition of healthy squirrel monkeys are described by R. W. Cooper, and laboratory care and clinical management are discussed by C. M. Lang. Lang's chapter is admirable in dealing in detail with specific dietary problems and requirements, techniques of handling, anesthetics, procurement of body fluid and tissue samples, preventive medicine, and caging. The author is aware that the information available is limited, but his statement that "knowledge in this area is indeed fragmentary" is overly modest.

Specific dietary problems in the care of pregnant females are dis-

cussed by C. M. Goss *et al.* (see especially pp. 172–73 and 188–89), and basic information about embryological development, conception, and gestation is also presented. The chapter by L. A. Rosenblum also describes problems of diet and pregnancy outcome and offers practical solutions to some important medical problems.

A wealth of information about the social behavior of *Saimiri sciureus* is included in the book. R. W. Thorington presents data obtained during a 10-week study in a Colombian forest, and F. V. DuMond reports on a detailed, long-term study of a large colony maintained under seminaturalistic conditions in the Monkey Jungle near Miami, Florida. The descriptions of play behaviors on pages 110 and 129–30 are of particular interest. Literally all primary forms of social interaction, including maternal and "aunt" behavior and heterosexual behavior, are adequately detailed.

An excellent account of mother-infant relations and early behavioral development is provided by Rosenblum. Rosenblum details the formation and gradual dissolution of the mother-infant bonds, and also is able to compare and contrast the nature and developmental rates of these behaviors and other social measures with the same measures obtained previously on pigtail and bonnet macaques. Finally, he compares (see p. 231) the developmental course of mother-infant contact, protective maternal behavior, mother-infant separation, and sequential forms of infant play in pigtail and bonnet macaques and squirrel monkeys. Additional social data are contained in a chapter on social communication by P. Winter.

D. M. Rumbaugh considers the learning and sensory capacities of *Saimiri*

*sciureus*. Not only does his chapter present a scholarly and skillful review of the abilities of the squirrel monkey, but it also compares the capacities of this species with those of other primates ranging from the gorilla, orangutan, chimpanzee, and gibbon to the galago, loris, potto, and lemur. Nor are sub-primate forms excluded, as is witnessed by the effective use of comparative learning data taken from the rat and the rock squirrel. Even the performance of the tree shrew is cited, whether or not G. G. Simpson has changed his mind about assigning it to the order of primates. For the investigator interested in learning, Rumbaugh's thoughtful analysis of criterion versus fixed-trial learning-set training may be of interest, and his conception of the *R/A* ratio in the formation of discrimination-reversal skills as an effective comparative measure of intellectual abilities merits attention.

There are four other chapters, all highly specialized, dealing, respectively, with parasites, physical growth and dental eruption, brain mechanisms, and the use of the squirrel monkey in pharmacological research. These chapters, like the others, present a large amount of valuable information in clear and concise form.

*The Squirrel Monkey* should be extremely useful to the comparative psychologist, zoologist, ethologist, and primatologist. It is the only complete book ever written on the squirrel monkey. It is, in addition, extremely authoritative and scholarly, with the exception of limited parts of several chapters. The book should fill a great need that has existed for a considerable number of years.

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## Astrophysical Processes

**Variable Stars.** JOHN S. GLASBY. Harvard University Press, Cambridge, Mass., 1969. x + 334 pp., illus. \$6.95.

This book is directed to the intelligent amateur, but it can be read with profit by students and by professional astronomers. It summarizes the principal parts of our knowledge of stars undergoing light and spectral changes which are rapid compared to most of the changes during the evolutionary process. Such stars are obviously at

critical stages of their development, and study of them is essential in understanding the whole of stellar evolution. In addition, variable-star studies have been essential in investigating galactic structure and in measuring the distances of star clusters and external galaxies.

The book is divided into the usual sections on eclipsing, intrinsic, and eruptive variables. Chapters under each heading discuss the characteristics of