

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

subclasses. The last two chapters consider the role of variable stars in astronomical research and methods of observation.

The discussion does more than merely relate details of light and spectral changes. In addition to pertinent historical aspects, spatial distribution, population types, the physical processes responsible for the different types of variability, and the probable state of evolution of the stars in each class are considered. Rival theories are presented fairly and each is critically examined. Useful tables list examples of variables of each type.

Errors are remarkably few for a first edition of a work summarizing such an extensive quantity of data, and those that do exist are mostly trivial. The eclipse of Algol lasts considerably longer than "almost two hours" as stated on page 15; in figure 13, the  $\beta$  Canis Majoris variables are incorrectly located; the velocity of the solar

electrons mentioned on page 233 is probably 1000 miles per second instead of 1000 miles per hour. In an effort to cover briefly a difficult field, the discussion of solution of light curves of Algol variables has been condensed a little too much for rigor, with minor misstatements resulting. The discussion of the evolution of close double stars (pp. 31 and 32) is out of date. The speculations there listed have been replaced by more realistic calculations. However, these and other minor errors detract little from the overall discussion.

In summary, this book is both authoritative and a pleasure to read. It successfully summarizes a large, active, and complex field of modern astronomy. It has a place in every professional and personal astronomical library.

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## Papers on Hormones

**Pharmacology of Hormonal Polypeptides and Proteins.** Proceedings of an international symposium, Milan, 1967. NATHAN BACK, LUCIANO MARTINI, and RODOLFO PAOLETTI, Eds. Plenum, New York, 1968. xii + 660 pp., illus. \$27.50. *Advances in Experimental Medicine and Biology*, vol. 2.

A wealth of information on the hormonal peptides and proteins, some of it previously unpublished, is presented in this volume. The papers include reports on the classical hormones, such as the hormones of the anterior as well as the posterior pituitary gland, the releasing factors, the gastrointestinal hormones, hormones of the pancreas and parathyroids, placental lactogen, and thyrocalcitonin. A section is devoted to the new hormonal polypeptides, including not only angiotensin but also, among others, the kinins, caerulein, erythropoietin, and relaxin. This raises the question, What is a hormone? Are we truly dealing with hormones when we discuss the kinins, or do we—from the physiologic point of view—have a different class of compounds? Are we resurrecting the same old question that raged with regard to histamine? I would agree that definitions should be changed when new data so indicate, but it would have helped here if the editors had given

some explanation of what a hormone is and hence of why some of the compounds were included. Such a statement would go far to help clarify a situation that might get worse. It should also be pointed out that relaxin was first described by Hisaw in 1926 and can hardly be called a new hormonal polypeptide.

In spite of the foregoing criticism, this reviewer is most intrigued by the broad coverage presented in this volume and is of the opinion that it is a good idea. It could go a long way to bringing some cohesion and cross-fertilization to the field.

It is impossible to review the book in its entirety because of the tremendous coverage. It contains approximately 76 articles ranging in length from 1 to 17 pages. Many of the articles are highly informative, presenting much detail; some are essentially abstracts, presenting little. Nevertheless, the book contains much that is of value to the investigator, such as the excellent series of articles on peptide synthesis and mechanisms of action. Although the coverage is a bit uneven, much recent and important information is presented.

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## The Hominidae

**Evolution and Hominisation.** Papers to the Theory of Evolution as well as Dating, Classification and Abilities of Human Hominids. GOTTFRIED KURTH, Ed. Second edition. Fischer, Stuttgart, 1968 (U.S. distributor, Abel, Portland, Ore.). xii + 300 pp., illus. \$12.50.

The initial edition of this collection of papers originally served as a 60th-birthday festschrift for Gerhard Heberer, a prolific student of vertebrate evolution in general and human evolution in particular. This second edition contains all the 18 original contributions, most of them either substantially revised or with appendices added to update them, and two new contributions. A fourth of the 20 papers deal with various philosophical or theoretical aspects of general evolution (contributions by G. G. Simpson, E. Mayr, Th. Dobzhansky, W. Herre, M. Roehrs, the last four in German). Three papers deal with various aspects of late Cenozoic time, including its subdivision and estimations of "absolute" age through radiometric measurements (contributions by Bj. Kurtén, H. J. Lippolt, G. H. R. von Koenigswald). Three papers discuss current knowledge of some Pleistocene faunas in three regions of Asia (contributions by D. A. Hooijer, H.-D. Kahlke). Nine papers are devoted directly to general or specific aspects of the origin and evolution of the Hominidae. These include: the case for *Ramapithecus* as a later Tertiary member of Hominidae (E. L. Simons); the australopith phase of hominid evolution, biologically and culturally considered (contributions by J. T. Robinson, R. A. Dart, K. P. Oakley); and particular and general features of human evolution during the mid- and late Pleistocene range of time (contributions by P. V. Tobias, G. Kurth, A. A. Dahlberg, K. J. Narr, H. Grimm).

Any such collection of papers by a series of authors presents problems to the editor and to the reader, not to mention the reviewer. However, in this day of increasing journal diversification and specialization there is a need for collections of topical and review papers, particularly ones aimed at crossing traditional disciplinary lines and explicating, if not integrating, a diversity of researches which bear on a related set of problems. A festschrift is still an excellent way for this to happen, and it is altogether too easy