drink of water, his cupped hands did as well as a cup that would have required calories to manufacture" (p. 29). This uncritical inference from White's energy theory is offered in the face of a photograph (p. 21) showing a Paiute woman surrounded by baskets one of which is especially noted as being made watertight with a coating of pitch. Shoshones and Paiutes drank from woven vessels pitched just to the right degree to allow very slow evaporation to keep the water cool and delicately pine-flavored. In the desert, this makes for *good* drinking.

The book is replete with large generalizations, dogmatically asserted. Bombast is often substituted for substance in an effort to carry a point.

There are, of course, different criteria for evaluating Farb's book. Service, in writing the introduction, praises it as the best general book about North American Indians he has ever read and states that it is a very good book in an absolute sense for two reasons: its "contribution to the theory and practice of cultural evolutionism," and because the author "writes like a breeze" (p. xix). But then, Service with innocent candor claims, "Many American readers are Boy Scout types like me, who refuse to grow up. . . . This is a great book for them (us)" (p. xx).

Per contra, for readers who have grown up and who prefer scholarly and scientific craftsmanship to the work of a breezy Boy Scout, Farb's book is not the one.

E. ADAMSON HOEBEL
Department of Anthropology, University of Minnesota, Minneapolis

Controlling Populations

The Problems of Birds as Pests. Proceedings of a symposium, London, 1967. R. K. MURTON and E. N. WRIGHT, Eds. Published for the Institute of Biology by Academic Press, New York, 1968. xvi + 256 pp., illus. $9.50. Symposia of the Institute of Biology, No. 17.

The theme that emerged from this conference is the necessity of understanding the behavior and ecology of a species before starting measures to control its numbers or evade its depredations. The conference considered two topics: birds as hazards to aircraft and birds as agricultural pests. There was one paper on urban birds, but nothing on birds as carriers of human disease.

Of the two most noteworthy papers, one, by G. W. Schaefer on the microwave reflectivity of birds, is only tenuously related to the main problem. The other, by R. K. Murton, is a masterly review, in simple language, of observational studies of the population dynamics of birds. In the cases studied, the population was limited ultimately by the amount of available food, and behavioral interactions determined which individuals from the annual surplus were eliminated. Attempts to control the species merely hastened this elimination and had negligible effects on the eventual population level. Although the ultimate goal of pest control is thus shown to be extremely difficult to achieve, the factors controlling these populations are now well understood: it is singular that the mathematical model-builders have paid no attention to this work during the last 10 years. Deductive models incorporating these factors can easily be built: any model that does not incorporate them is simply wrong.

This exemplifies the other point beautifully made in this book: the difficulty of making nonbiologists appreciate the implications of field studies. The difficulty, clearly illustrated in the lively discussions which follow the groups of papers, is reflected in the inability or unwillingness of most government agencies to recognize that taking account of natural principles, and planning in accordance with them, may be cheaper than attempting to defy them. Thus most airlines, federal agencies, and airport managers continue to seek technological solutions to bird-strike problems, or to ignore their costs and damage. Governments have not made use of knowledge of bird movements laboriously gathered at their expense. Agriculturists continue to support methods of destruction such as payment of bounties, despite proofs that these measures are useless.

This book should be required reading not only for administrators but for theoreticians and population biologists.

WILLIAM H. DRURY
Massachusetts Audubon Society, Lincoln

Insects and Man

Entomological Parasitology. The Relations between Entomology and the Medical Sciences. MARCEL LECLERCQ. Translated by G. Lapage. Pergamon, New York, 1969. xviii + 160 pp., illus., + maps. $8. International Series of Monographs in Pure and Applied Biology: Modern Trends in Physiological Sciences, vol. 29.

This short book is a translation of a work by a medical man who has become an entomologist. It is largely an encyclopedic account of knowledge about arthropods of interest to medical practitioners. Its import is that of a bridge to entomological knowledge—it is not a compendium on insects. The format of the book suggests that it was compounded from a series of lectures.

The book is comprised of 13 chapters. The first, and longest, chapter deals with pathogens afflicting man that are, at times, in or on arthropods. Much of the detail is presented in tables listing the pathogens according to their taxonomic associations. Otherwise, short paragraphs are devoted to the distribution and vector complexes of many pathogens. Chapters 2 through 8 discuss human reactions to arthropods. Arrangement is according to mode of attack—(i) puncturing for blood, (ii) injection of venoms by bite or sting, (iii) induction of allergies by secretions, by inhaled allergens, or by fragmented bodies, and (iv) annoyance. The last 40 pages deal with miscellaneous topics such as insects as sources of therapeutic agents, as sources of food, and as factors in legal aspects of medicine, and aspects of control.

Possibly the best discussion, and one presenting information little known generally, is the chapter on entomology and legal medicine. The sequence of necrophagous insects invading a body may provide clues to time and causes of death. The discussion of insects as occupational hazards should be of interest to medical practitioners and entomologists.

The book is most valuable for the lists of references cited at the end of each chapter. References are numerous and include many important ones, particularly of European and Asian origin.

Sketchiness is the price paid for brevity in this account. The extensive bibliography compensates for this state where adequate libraries are available. Pages devoted to the control of arthropods might have been more helpfully

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.

WILLIAM R. HORSFALL
Department of Entomology,
University of Illinois, Urbana

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 discussed 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 subprimate 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 criterional 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.

H. F. HARLOW
Regional Primate Research Center,
University of Wisconsin, Madison

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