

chordates, and other major groups, such as the many wormlike animals, receive little attention.

For all of the problems of organization and multiple authorship, the book contains much valuable information and is reasonably up to date. Black-and-white illustrations of fossils in the margins are useful supplements to the text. In addition, there is a profusion of color plates, most of them excellent, interspersed throughout the text. These lose some of their effectiveness because they rarely accompany the text to which they pertain. As a rule they are in the following chapter. The color plates are not numbered or keyed except by occasional page references in the text. The result is that this readily avoided organizational flaw reduces the potential values of the plates materially.

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## REPRODUCTION AND DEVELOPMENT

THE EVOLUTION OF REPRODUCTION. *Reproduction in Mammals, Book 6.*

Edited by C. R. Austin and R. V. Short; illustrated by John R. Fuller. Cambridge University Press, Cambridge (England) and New York. \$15.95 (hardcover); \$4.95 (softcover). viii + 189 p.; ill.; systematic names and subject indexes. 1976.

This is the sixth in a series of small volumes on reproduction, all of which are directed to a wide audience in both pure and applied biology. This volume, like the others, can be read and appreciated by both specialists and non-specialists alike, including reproductive physiologists, veterinarians, zoo curators, and undergraduates in zoology. Its usefulness results from an emphasis on concepts rather than facts, and the tendency to review the recent major trends within particular research areas in reproduction.

There are five chapters in this book which examine reproduction from both a microevolutionary and macroevolutionary standpoint. In Chapter 1, Ohno discusses the benefits of sexual reproduction and the probable reasons why vertebrates have not often chosen to be hermaphroditic or parthenogenetic. The size differences between the X and Y sex chromosomes are reviewed and the probable evolution of the very small mammalian Y-chromosome is discussed. Finally, Ohno emphasizes the essential conservatism of the genetic material.

G. B. Sharman's second chapter examines how viviparity evolved in mammals from the development of internal fertilization. Emphasis is put on a com-

parison of monotreme, marsupial, and eutherian methods of reproduction, including the anatomical and endocrinological changes required to prolong gestation, the development of more efficient intrauterine nutrition, and the evolution of teats for extrauterine nutrition. Sharman emphasizes that there are alternative routes to viviparity and that marsupial-eutherian differences are probably a result of parallel evolution.

The third chapter by P. A. Jewell examines how mammalian males and females differ in their reproductive interests and strategies and how this affects mating systems. The factors influencing the evolution of monogamy in mammals are discussed and compared with birds where the advantages of monogamy are much clearer. The behavioral characteristics common to polygynous mammals are reviewed and differences in the mating strategies are correlated with ecological characteristics. Finally, there are some theoretical considerations of the relationship between sexual selection and parental investment.

R. V. Short's chapter on the origin of species reviews several isolating mechanisms that may work in the absence of geographical isolation and then geographic isolation itself. The manner in which species could evolve via chromosomal changes is well-illustrated by discussions of equid and sheep cytogenetics. Finally, Short theorizes about social evolution in humans, in a rather dramatic departure from his previous sections.

The final chapter by E. R. Austin discusses variation in mammalian gametes as it relates to phylogeny and function. There are clear similarities in gamete structure in closely related mammals which are obviously homologues, but Austin also reviews the remarkable variability — e.g., in the shape of sperm heads in several mouse subspecies. For many specializations and variations, functions are difficult to determine, and Austin concludes that some of the variability may not be functional but is simply non-adaptive variation.

The book is well-illustrated with attractive figures and drawings, but like the others in the series, has only a short selective bibliography at the end of each chapter.

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## PATTERNS OF SEXUALITY AND REPRODUCTION.

By Alan S. Parkes. Oxford University Press, London and New York. \$7.25 (cloth); \$3.75 (paper). xi + 148 p.; ill.; index. 1976.

This little volume sets out to bring together existing data on human sexuality and reproduction. A pleasant melange of information results, not all of it conclusive, as Alan Parkes readily admits. In a discussion of menstrual synchrony, we are offered college roommates, good friends, rats, and mice.