

Book Reviews

Mammalian Reproductive Biology, by F.H. Bronson. Chicago, Ill.: University of Chicago Press, 1989. 325 pp. \$45.00 (cloth), \$17.95 (paper).

Mammalian Parenting: Biochemical, Neurobiological, and Behavioral Determinants, edited by Norman A. Krasnegor and Robert S. Bridges. New York: Oxford University Press, 1990. 502 pp. \$75.00 (cloth).

Reproduction is a critical part of any organism's biology. Differential reproductive success of individuals is the driving force in evolution, responsible for both the development of the intricate adaptations of species members and the extraordinary diversity of life on Earth. Myriad processes at all levels, from the biochemical to the organismic, influence the ability of animals to reproduce.

Given the importance and complexity of reproduction, it is not surprising to find a range of useful approaches to its study. Some investigators focus on hormonal, neuronal, and biochemical processes that permit sexual reproduction to take place; others attend to the ways in which species-typical patterns of reproductive behavior enable members of different populations to reproduce successfully in diverse environments. A complete understanding of reproduction requires both causal analyses of the mechanisms supporting reproductive behavior and functional analyses of the interaction of reproducing organisms with their environment.

Frank Bronson, author of *Mammalian Reproductive Biology*, like many of his fellow zoologists, is fascinated by the diverse patterns of reproductive behavior and their control mechanisms exhibited by the more than 4000 extant species of mammals. Bronson wants, first, to describe the adaptations that enable members of wild populations to reproduce successfully in natural situations and, second, to organize information from geography, ecology, neuroanatomy, and endocrinology so that the forces acting over evolutionary time to produce the observed diversity in mammalian reproductive behaviors and their physical substrates are made explicit. The result is an integrative and holistic, although idiosyncratic and speculative, search for both broad principles in reproductive behavior and new directions for research at the interfaces between the environment, the reproducing individual, and the individual's internal milieu.

From Bronson's perspective, that of a physiologic ecologist, the variables to be considered in understanding the reproductive behavior of mammals living from the equator to the polar regions include species-

typical life span, seasonality of availability of nutrients and of thermal stress, social influences, and interactions of each of the previous items with neuroendocrine systems.

Those accustomed to rigorous reductionist analysis, to experimental verification of each stage of an argument, and to conservative theorizing and those not convinced of the value of theories based on correlational data and functional argument may find some of Bronson's more speculative passages irritating. For example, in discussing the continued breeding of Kansas prairie voles in midsummer and in midwinter, when the probability of reproductive success is low, Bronson (p. 34) asserts, "The gamble is worth the effort; otherwise it would not be a routine part of this population's reproductive strategy. As noted earlier, the ultimate driving force [in voles] is short life expectancy. Verifying that simple biological rules always have exceptions . . . the short-lived harvest mouse . . . never breeds during the winter in Kansas."

When I read this passage and others like it, I was left with more questions than answers. In what sense does a population rather than its members have a "reproductive strategy"? In what sense is failing to stop reproducing under unfavorable circumstances a "strategy"? In what sense do animals have "strategies" anyway? Is there really evidence that short life expectancy, rather than one or another of its many correlates, shapes reproduction? Without explicit boundary conditions, what good is a "biological rule" that is proven by its exceptions?

Despite such quibbles, I was left with the strong feeling that Bronson is pointing to important general biologic truths that will increase our understanding of the reproductive process and escape more conservative (or less speculative) intelligences.

Krasnegor and Bridges' volume is a very different undertaking from Bronson's monograph. An edited volume containing 23 chapters by 33 authors (none of whom is a zoologist), *Mammalian Parenting: Biochemical, Neurobiological, and Behavioural Determinants*, as its title suggests, focuses on hormonal, neural, and biochemical substrates of parental behavior in mammals and on the role of individual experience in the development of normal patterns of parenting.

Although many of the contributors to Krasnegor and Bridges' comprehensive work are surely aware of the importance of the ecologic variables affecting reproductive behavior that Bronson emphasizes, attention in this well-conceived and well-edited volume is directed elsewhere. Some chapters review major research studies from behaviorally oriented laboratories; other chapters are concerned with either hormonal control of parenting in mammals or its neurologic basis. There are several reviews of various aspects of human parental behavior and its hormonal correlates and excellent overviews of the sociobiology of parenting and of sexually dimorphic structures in mammalian brains.

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Still, I must speculate to monograph. The approaches to theory in both views of

*Department of Psychology
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*Principles of Population
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\$39.95.*

*A Primer of Population
Mass.: Sinauer*

Both these books on population introduction to and quantitative study of human with mathematical literature. The depth of detail makes use of or (e.g., variance, makes use of or twice as long, as the primer, differences in examples into interspersed throughout for the illustration

The chapters are generally authoritative, providing useful summaries of a variety of research topics in laboratory studies of mammalian parenting at a level suitable for graduate students and professionals. In sum, the book is a first-rate edited text, containing well-organized, thorough, sophisticated reviews of important topics by experts in meaningfully related fields. The arguments are precise, the speculation is under careful control, and the empirical work discussed often provides examples of hypothetico-deductive methods in the life sciences at their best.

Still, I must confess to missing the broad views and exuberant speculations to which I had grown accustomed in reading Bronson's monograph. There is much to be learned from synthetic and analytic approaches to the study of mammalian reproduction. There is grandeur in both views of life.

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Principles of Population Genetics, 2d ed. by Daniel L. Hartl and Andrew G. Clark. Sunderland, Mass.: Sinauer Associates, Inc., 1989. 682 pp. \$39.95.

A Primer of Population Genetics, 2d ed. by Daniel L. Hartl. Sunderland, Mass.: Sinauer Associates, Inc., 1988. 305 pp. \$16.95.

Both these books are new editions of previously published textbooks on population genetics. Both are clearly written texts that provide an introduction to the concepts and mathematical models of population and quantitative genetics. They are rich with examples taken from the study of humans and other species, and each provides the reader with mathematical problems based on actual data from the published literature. The two works differ in the level of mathematics used and in the depth of detail discussed. Whereas *A Primer of Population Genetics* makes use of only basic algebra and simple concepts from linear statistics (e.g., variance, correlation, regression), *Principles of Population Genetics* makes use of elementary calculus. The latter work is also more than twice as long, and, although it covers essentially the same subjects as the primer, it provides much more detail. There are also minor differences in structure. The shorter *Primer* integrates the illustrative examples into the text while placing mathematical problems in boxes interspersed throughout the text. The longer *Principles* uses similar boxes for the illustrative examples, some of them mathematical problems with