

## Book Review

*Beyond Sociobiology*. By John D. Baldwin and Janice I. Baldwin. New York, Oxford: Elsevier North Holland, Inc., 1981, 325 pp., \$29.50.

*Beyond Sociobiology* contends that "sociobiology" as a theory is "unbalanced" in its emphasis on genetic determinants of behavior. The Baldwins advocate "balanced biosocial theories" which give appropriate recognition to both "distal" (a term the authors prefer to the sociobiologists' "ultimate") and proximal causes of behavior. Among the proximal causes considered are those in the categories "constructive inputs" (nutrients, exercise, stimulation, etc.), "destructive inputs" (poisons, disease, injury, etc.), and "natural learning," but the latter receives the most coverage by far.

The first three chapters present the "design features" for balanced biosocial theories and argue the case that sociobiology (as represented, principally, in the writings of E. O. Wilson) is unbalanced. No doubt the Baldwins may be accused of attributing to sociobiology a position too extreme on the role of genetics in behavior, but this will be an accusation which they anticipated (p. 51):

Although some sociobiologists claim that they are not overly biased toward evolutionary explanations, their actions speak louder than their words. The vast majority of their written work reveals their enthusiasm for applying genetic theories to behavior at all phyletic levels.

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The heart and strength of *Beyond Sociobiology* is seen from Chapters 4–7. In Chapter 4, the fundamentals of "natural learning" (more on this below) are defined and discussed. Then, drawing upon their backgrounds in the naturalistic study of primate behavior, the authors provide an admirably consistent and rigorous application of the probable roles of reinforcers, punishers, and natural learning in the development of an individual's behavior (Chapter 5) as well as in the development of primate social organization (Chapter 6). Having shown the potential of the role of natural learning in the development of behavior, the Baldwins use (in Chapter 7) their considerable knowledge of primate exploratory and play behavior to exemplify the theoretical approach that balances the role of distal and proximal influences on those behaviors.

Chapter 8 is an adequate but uneven effort to suggest the applicability to humans of the balanced theoretical approach. A curious anomaly (given the authors' presumably extensive knowledge of squirrel monkeys) is their acceptance without question of a study that included squirrel monkeys among the tree shrew and Old World primates in a list said to be an example of an "evolutionary series" (pp. 218–219). Also objectionable is the statement that "... non-human primates do not use rules and humans do. . . ." (p. 235). An example given for rule use involved an "if . . . , then . . ." type of *conditional* rule ["If you bring the cards . . . (then) . . . we will play some bridge and have some

fun"). It is well established [see studies cited in Thomas, *Brain Behavior and Evolution* 17:452–474 (1980)] that nonhuman primates can learn conditionals (even conceptually), and it is quite possible that they might use the analogues of such rules in the natural environment (e.g., recognition by a subordinate monkey that *if* it does not yield a sitting place to a dominant one, *then* it may be attacked).

The last chapter more than makes up for Chapter 8. Especially interesting is the development of the analogy that natural learning is to proximal causes of behavior as natural selection is to distal causes of behavior. While natural learning was never clearly distinguished from laboratory learning, an intriguing argument for the aforementioned analogy was the authors' suggestion that laboratory learning data may serve a role in the development of a theory of natural learning similar to that served by selective breeding data in the development of the theory of natural selection. From the laboratory, the Baldwins drew heavily from data on habituation, Pavlovian conditioning, operant conditioning, and observational learning and considerably less from data on imprinting, insight learning, and contiguity learning. My work (*supra vide*) compels me to suggest that serious consideration should be given to the role of concept learning by animals. It is very reasonable, in terms of the way the Baldwins adapted laboratory findings to natural learning in the field, to believe that concept learning (including rules)

may be a very important aspect of natural learning in animals, especially nonhuman primates.

*Beyond Sociobiology* is recommended for all students of animal behavior, pre- and postgraduate, but it should be especially relevant to students of primate behavior and to those who seek a strong alternative to the emphasis and notoriety of sociobiology. The writing style is clear, direct, and remarkably free of errors of grammar and construction, although the occasional redundant phrase may be noted ("its own unique" pp. 169, 171). The text is well organized both across and within chapters. There is good use of tabular and graphical information; Table 7.1 (pp. 184–185), which lists, organizes, and documents functions attributed to exploration and play, is especially noteworthy. However, the photographic reproductions are poor; most appear overexposed, but surely there are not that many bad photographers in the field! Only five typographical errors or misspellings were spotted ("brids," p. 77; "next" for nest, p. 90; "environemtnal," p. 178; "comedian," p. 225; "speical," p. 240) but the References, Glossary, and Index were not read closely. The flaws are minor. Read *Beyond Sociobiology*. It has the potential to be a very important work in the continuing development of the study of behavior.

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