Issues Concerning Behavior

The Development of Behavior. Comparative and Evolutionary Aspects. Based on a symposium, June 1977. GORDON M. BURGHARDT and MARC BEKOFF, Eds. Garland STPM Press, New York, 1978. xiv, 430 pp., illus. $32.50. Garland Series in Ethology.

This book is based on an Animal Behavior Society symposium at which the contributors were asked to emphasize the comparative and evolutionary aspects of behavioral development. Not everybody did so and some have nothing much to say about either evolution or development. Furthermore, many of the contributions are comparative only in the weak sense that they are bedfellows with papers about a wide variety of invertebrates and vertebrates. Since the problem of how an individual animal develops is distinct from the problem of how its ancestors changed during the course of evolution, it is not easy to write about both issues without merely being confused. Even so, some contributors have responded interestingly to the challenge. One point, which emerges particularly clearly from Noakes's chapter on fish but also from other chapters on insects and amphibians, is that the differences between adults and young may reflect features of the kind of environment to which each stage is adapted. By studying the behavior and ecology of the same animal at different ages, functional and evolutionary sense can be made of some of the changes that occur during ontogeny. The implication for studies of developmental process is that continuities from an early to a late stage should not necessarily be expected.

I was hoping that the symposium would consider the selection pressures on rate of development and on the timing of particular changes that occur during the life cycle. While these issues receive disappointingly little attention, Kroodsma does comment lucidly on why sensitive periods for song learning should vary from one species of bird to another. Also, the functional significance of experience is discussed by Marc Bekoff in a lively article about play.

So far so good. Unfortunately, the opportunity to bring evolutionary considerations into a discussion of behavioral development has also raised some primeval muddles. Phylogenetically adapted behavior is simply treated as equivalent to genetically determined behavior without any thought being given to necessary instructions from the environment, which are often a feature of normal development. Internal control is set in opposition to external control and in the process known interactions between genes and experience are swept aside. Sources of variability in behavior are treated as though they were components of fully developed behavior—which is about as sensible as arguing that 20 percent of bread is due to the cooking.

Connoisseurs of category mistakes will recognize much of this confusion in the hard-selling promotional literature of sociobiology. The editors have not helped matters by seeming to make a virtue of falling into the old conceptual traps. For instance, in their introduction they write, "We do not find the nature-nurture (or instinct-learning, etc.) debate inherently useless." Later they argue that "the use of phylogenetic arguments is appropriate to analyses of human social behavior." Indeed, the only two chapters on human development are on the use of twin studies to distinguish between genetic and environmental contributions to individual differences (Plomin and Rowe) and the study of sex differences in children's play to justify speculation about the sexual division of labor in our ancestors (Harper and Huie). The confidence with which these authors march into such treacherous swamps is something to marvel at. It would have been nice to see their approach offset by some discussion of the abuses of heritability estimates and of the ways in which predispositions to behave in a particular kind of way can be overridden under certain conditions. It is, after all, in this kind of debate that something is learned about, among other things, the processes of development.

Not that process is by any means totally neglected in this book. For instance, Fentress offers some original and promising ways of both describing and thinking about the subtle changes with age in the coordination of grooming by mice. In different ways and for different reasons, Noakes, Burghardt, Hoffman, M. Bekoff, Mason, and Beck consider the means by which experience can influence the course of development. Fagen makes a strong and justifiable plea for explicit theories of what is happening in the course of development and explores interestingly the usefulness of some ideas about dynamic programming. Furthermore, the excellent reviews by Anne Bekoff on the development of motor coordination in chick embryos and by Kroodsma on song learning in birds raise important questions about the ways in which adult behavior is assembled.

Taken as a whole this book partially succeeds, in that it reaffirms the value of studying a wide variety of animals and of using a broad range of methods when studying behavioral development. It shows how studies of evolution and development can nourish each other. It also shows, however, how dense fog readily settles over such discussion. As distinct issues merge together in the murk, what passes for new argument sounds remarkably like the echoes of old and empty rhetoric.

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Small Mammal Ecology

Populations of Small Mammals under Natural Conditions. Papers from a symposium, Linesville, Pa., May 1976. DANA P. SNYDER, Ed. University of Pittsburgh Pymatuning Laboratory of Ecology, Linesville, Pa., 1978. xiv, 238 pp., illus. $8.50. Pymatuning Symposia in Ecology. Special Publications Series, vol. 5.

Small mammals ought to be to population ecology as *Drosophila* is to genetics. But the Golden Age has not yet arrived, and this symposium volume is instructive in revealing why. Twelve review papers and ten discussion papers are combined with transcripts of the informal discussions that followed to provide a volume that spans the biology of small mammals. Two of the papers are of general interest to ecologists: Hayne opens the review papers with some timely reminders about replication and experimentation, and Conley and Nichols review the use of models for understanding natural populations. More progress might have been made in the rest of the symposium if more attention had been paid to the methodological points raised in these two reviews.

Much of small mammal ecology flounders about because key questions and trivial questions are mixed together and few people seem to distinguish between them. Whether spacing behavior limits population size is a key question; whether home ranges are of equal size in males and females is a trivial question. Whether the species composition of small mammal communities is restricted by competition for food is an important question; whether small mammals consume 1 percent or 5 percent of the net primary production is a trivial question. The distinction between key questions and trivial questions often revolves about the dif-