

ready." The author knows how behavior patterns are attained, yet in an attempt to simplify he misleads and confuses. Another oversimplification and inadequate explanation occurs when he describes homiotherapy as "carrying climate in the veins." Other terms, for example 'niche,' are used but not really defined at all.

The author's approach in relating his observations is often anthropomorphic: skunks "yearning" for companionship, female ducks being "bored" with the male courtship display. I found disconcerting the way the subject (plant or animal) being discussed gave way to another and another. Statements on five or six species may occur in one short paragraph so that the reader is left confused. Beginning with chapter 6 there is less of this and the more sustained discussion of a species or a concept is pleasant after so much jumping about earlier.

The author failed to give any consideration to environmental crises or disturbances. These would have

fitted into his theme well enough since changes in behavior would result from changes and disturbances in habitat and microhabitat. On two or three occasions the word 'pollution' is used, but it is used almost apologetically. It is as if the author does not wish to introduce this factor into his world, does not wish to complicate his world for himself or for his readers. Do not ignore it Mr. Rood, get involved. You have a responsibility in your reporting.

I wonder how many books of this kind have been published, how many more will be. They mean well, I know that. But unless they say something new, and are relevant to our time, can we have an end soon?

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Models in Paleobiology

Edited by Thomas J. M. Schopf. 1972. Freeman, Cooper Company, San Francisco. 250 pp. \$9.40.

Dr. Schopf and his authors have produced a review and synthesis of ten selected major aspects of paleobiology, drawing mainly upon the fossil record of marine invertebrates for their examples. Although Dr. Schopf disclaims (p. 5) that "Those who work on fossil vertebrates or fossil plants have less need for much of what is said [in the book] because their biological background is so much better," I consider that at least 50% of the materials are relevant to general palaeontology and that many palaeontologists of every inclination would probably benefit from reading the chapters, especially those in the latter parts.

The book comprises a series of ten essays grouped into four parts. Part I is the "Introduction" and contains Thomas J. M. Schopf's contribution, "Varieties of Paleobiologic Experience." In these two sections Dr. Schopf draws attention to the need for biological understanding in palaeontology, and that fossils, especially non-vertebrate ones, should not be treated as so many nuts and bolts that have only applied uses, such as stratigraphic markers. He also reviews some of the history of palaeontology and the philosophies that governed or arose from early models or paradigms, and so sets the general tone.

Part II considers "Morphology of the Individual" in two chapters. "Approaches to Morphologic Analysis" by David M. Raup discusses the concept that "all morphology is adaptive" and suggests that some morphologic patterns may derive from adventive sources, although they may subsequently become modified adaptively in divergent lineages. "Approaches to Biogeochemistry" by J. Robert Dodd and Thomas J. M. Schopf considers

chemical variation, especially in skeletons, of living organisms and whether such variations are dependent on physical, physicochemical, or genetic factors. While it is apparent that variations in chemical compositions of, say skeletons, exist because of latitudinal variations in oceanic temperatures, it is also evident that animals may discriminate for or against an element on a genetic basis. "How?" or "Why?" this may be done is still relatively unclear. In the fossil record, evidence of such selectivity is often obliterated by subsequent diagenesis.

Part III comprises four chapters on "Populations and Evolution." "Models Involving Population Dynamics" by Anthony Hallam reviews rates of increase and mortality within populations, and the effects of changes in these rates on palaeontological samples deposited or available for collection. "Punctuated Equilibria: An Alternative to Phyletic Gradualism" by Niles Eldredge and Stephen Jay Gould is a consideration of the lacunae in the fossil record. They consider that new species arise at loci on the periphery of the distribution of their ancestors and, because such speciation is geologically rapid, their potential fossil record is curtailed both spatially and temporally. Thus, gaps in the record are 'real' and indicate times of rapid evolutionary change which alternate with times of taxonomic stability to give a picture of "punctuated equilibria." "Models for the Evolution of Planktonic Foraminifera" by Francis G. Stehli, Robert G. Douglas, and Ismail A. Kafescioglu discusses diversity in planktonic foraminifera as a temperature-dependent phenomenon. They consider that greater diversity in the tropics reflects more available riches and show that genera that have a geologically ancient origin are more often present

in colder waters, and vice versa. They therefore conclude that, for planktonic Foraminifera, high rates of speciation or production of new genera are dependent on warmer temperatures. "Models in Phylogeny" by Michael T. Ghiselin sets out the *raison d'être* for phylogenetic studies. Dr. Ghiselin considers that such studies must be based on comparative anatomy, and that "we are interested mainly in the order of, and relations between, the parts" and "do not merely count similarities." He stresses the parsimonious interpretation of observations and the application of the spatial distribution of the fossils as well as their stratigraphic record. Thus, a phylogeny is an interpretative device in which much evidence from various sources and many judgments on the importance of characters are made. In the palaeontological record, absence of specimens, i.e., negative evidence, is rejected, except under extreme caution.

Part IV comprises three chapters on "Distribution." "Conceptual Models of Benthic Marine Communities" by Ralph Gordon Johnson discusses why particular species are found where they are, both in the present and in the fossil record. He records that fewer species are present in areas in which the substrate has been recently disturbed and suggests that the facies or conditions of deposition of the matrix may indicate whether a palaeontologic sample may be less than representative of the original living community. "Models in Biogeography" by Daniel Simberloff discusses mathematical concepts for ecological events in isolated ecosystems. The factors of rates of immigration, extinction and speciation, the relative sizes of the land masses of origin and colonization, and the distances involved are all related mathemati-

cally. Because the balances between rates of extinction and immigration or speciation differ under various conditions of the land mass, the fossil samples available will vary in diversity, and this must affect their biological interpretation. "Conceptual Models of Ecosystem Evolution" by James W. Valentine relates the strategies by which organisms may react to stable or fluctuating energy systems. He considers that extinction in a highly varied and stable ecosystem comes about with increasing fluctuation in the energy source which will favor the adaptable ecological generalist at the expense of the specialist, and thus the diversity of the systems will decrease.

These ten essays do succeed in their authors' wishes to introduce to others wider concepts by which invertebrate palaeontologists may see their science more clearly. The volume also contains all the references cited in full for easy location, an attribute with which I am fully in accord, as many an abbreviated reference has remained unlocated by me because of too cryptic a citation or an error that is not evident. There is also an index containing all proper names and many subject headings.

I do not recommend this book for general or easy reading, but do recommend it to palaeontologists or ecologists. Certainly those interested in the marine ecology and palaeontology will benefit from its contributions.

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NEW TITLES

Zoology

***Alaska and its wildlife.** By B. L. Sage. 1973. Viking Press, New York. 128 pp. \$14.

The animal in its world. Explorations of an ethologist 1932-1972. Volume 2, Laboratory experiments and general papers. By N. Tinbergen. 1973. Harvard University Press, Cambridge, Mass. 232 pp. \$14.

Animal parasites. Their life cycles and ecology. By O. W. Olsen. 1974. 3rd edition. University Park Press, Baltimore. 525 pp. \$16.50.

***Atlas of animal migration.** By C. Jarman. 1972. John Day, New York. 124 pp. \$10.95.

★*Bird damage to fruit crops in the Niagara Peninsula. By R. G. B. Brown. 1974. Canadian Wildlife Service Report Series Number 27. 60 pp. \$1.50.

★*Butterflies of Saskatchewan. A field guide. By R. R. Hooper. 1973. Saskatchewan Department of Natural Re-

sources. Copies available from the Museum of Natural History, Regina, P.O. Box 1121. 216 pp. \$3.

***Butterflies of the world.** By H. L. Lewis. 1973. Harrap, London. 312 pp. \$37.

★*Calf mortality on the calving ground of Kaminuriak caribou. By F. L. Miller and E. Broughton. 1974. Canadian Wildlife Service Report Series Number 26. 26 pp. \$1.

★*Canadian wildlife and man. By A. I. Dagg. 1974. McClelland and Stewart, Toronto. 192 pp. \$10.

Care of the wild feathered and furred. A guide to wildlife handling and care. By M. Hickman and M. Guy. 1974. Unity Press, Santa Cruz, California. 144 pp. Cloth \$7.95; paper, \$3.95.

Chameleons and other quick-change artists. By H. Simon. 1973. Dodd, Mead, New York. 158 pp. \$7.95.

Crustaceans. By W. L. Schmitt. 1973. David and Charles, Devon, England. £ 3.50.



Churcher, C. S. 1974. "Models in Paleobiology, ed. Thomas J. M. Schopf [Review]." *The Canadian field-naturalist* 88(3), 393–394.

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