

Ornithology at a Centennial

Perspectives in Ornithology. Essays Presented for the Centennial of the American Ornithologists' Union. ALAN H. BRUSH and GEORGE A. CLARK, JR., Eds. Cambridge University Press, New York, 1983. viii, 560 pp., illus. \$29.95.

The American Ornithologists' Union had an important birthday on 26 September 1983. Complementing the celebration of 100 years of growth and scientific contribution is this affordable volume of provocative reviews. Over this century ornithology has matured into the expanded, diverse science of avian biology. Ernst Mayr opens this series by reviewing the progress of his field with grandfatherly pride. Dominating the fibers of *Perspectives in Ornithology* are open debates by a suite of young iconoclasts. The self-reflective temper in the context of timely synthesis of a broad range of topics marks a healthy future for ornithological studies.

Some of the most exciting frontiers in ornithology belong to research on song learning (dealt with here by P. J. B. Slater, L. F. Baptista, and D. E. Kroodsma), navigation (C. Walcott and A. J. Lednor, K. Able), molecular genetics (G. F. Barrowclough, J. C. Avise, and G. F. Shields), cooperative breeding systems (S. T. Emlen and S. L. Vehrenkamp), and physiological ecology (G. E. Walsberg). For each of these the contributors review the known, but they also stress what is not known. Still mysterious, for example, remain the nature of a bird's navigational "map," why some birds learn their songs but others do not, the genetics of speciation, and the annual cycle of energetic constraints. Still lacking, moreover, are quantitative data to decide among alternative models of the evolution of cooperative breeding in birds; kin selection has now shuffled to the side and tentative models of ecological constraints, reciprocal help, and individual conflicts occupy center stage.

Perspectives in Ornithology is full of controversy and academic vitality. Tart reviews are the core of the volume. They are complemented and challenged by commentaries, many of which provide critical alternatives and thereby reinforce the effort to define priorities for the next round of ornithological research. The defense of optimal foraging theory by J. R. Krebs, D. W. Stephens, and W. J. Sutherland, for example, emphasizes the burgeoning set of second-generation models that struggle to address the deep complexities of behavioral performance in stochastic environments. J. P. Myers

then challenges the fragile foundation of even these deterministic models with a persuasive analogy of the vulnerability of computerized nations to an errant electromagnetic pulse.

Open tensions in community ecology and biogeography are now familiar to readers of *Science*. Here, iconoclasts J. A. Wiens and D. Simberloff push again to restructure the tenets of future research. Healthy signs include the growing appreciation of stochastic forces and the need for a balanced blend of dispersal and vicariance in biogeographical theory. Though the null statistical models that Simberloff and his colleagues propose doubtless will be replaced by others that are biologically more appropriate, Simberloff's basic challenge is sound. Ornithological intuition may be right, but science demands more than intuition.

Two of the most refreshing contributions to *Perspectives in Ornithology* are D. W. Mock's unorthodox approach to the study of avian mating systems and L. D. Martin's bold reorganization of the history of Mesozoic birds. In the first, Mock turns our thinking to the challenges of understanding both avian monogamy and the problems of genetic paternity. These, he suggests, are where breakthroughs may lie in the study of avian mating systems, a field that, I think, may be in danger of bogging down with historically asserted tenets, excessive fascination with polygyny, and a heavy burden of capitalized terminology. Mercifully, Mock never once resorts to "Male Emancipation," a prime piece of Victorian jargon.

The current renaissance of paleornithology is changing our views of the evolutionary history of birds. In his chapter, Martin revitalizes the pseudosuchian-crocodylian ancestry of birds and, in his most effective exposition yet, swings the pendulum away from Ostrom's influential papers on the relations of birds to dinosaurs. Martin also sides with advocates of an arboreal origin of avian flight and an aerodynamic origin of feathers. His views on these subjects, however, are weakened by his failure to mention, much less address, Regal's model of the evolution of feathers (*Q. Rev. Biol.* 50, 35 [1975]) and Caple *et al.*'s model (*Am. Nat.* 121, 455 [1983]) of the jumping ballistics of a bipedal reptile.

Martin also provides his own detailed analysis of derived character states of *Archaeopteryx* and other Mesozoic birds, concluding that *Archaeopteryx* may not have been on the main line of avian evolution after all but may instead

have been a primitive member of the Sauriurae. Included in this radiation of Cretaceous birds are the Enantiornithiformes, a diverse group described from Argentina, as well *Gobipteryx* from Mongolia and *Alexornis* from Baja California. The other proposed lineage of Mesozoic birds, the Ornithurae, includes the Hesperornithiformes and Ichthyornithiformes as well as modern birds. Intriguing as this scheme may be to the naïve neontologist, D. W. Steadman severely criticizes the details of Martin's argument. A clear picture of the early evolutionary history of birds is not yet in sight, but Martin—right or wrong—has made a major contribution toward its crystallization.

From paleontology to captive propagation, electromagnetic pulses, and physiological ecology the branches of avian biology seem to be growing vigorously. The editors of *Perspectives in Ornithology* have done well, the American Ornithologists' Union is to be congratulated, and readers of this fine volume will quickly sharpen their own ornithological perspectives.

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Adaptations of Colonizers

The Evolutionary Biology of Colonizing Species. PETER A. PARSONS. Cambridge University Press, New York, 1983. x, 262 pp., illus. \$29.95.

Parsons has patterned this book explicitly after the highly influential symposium volume *The Genetics of Colonizing Species*, edited by Baker and Stebbins, which was published in 1965. Since then much has been learned, and Parsons deals with those aspects of physiological ecology, behavior, and life-history evolution that are especially relevant to colonizing species.

The book makes some important points well. Parsons's emphasis on coordinated studies of the behavior, life history, ecology, and genetics of tractable species will benefit the field. The historical separation of these specialties, it is now widely agreed, was artificial. This book demonstrates that greater insight can be gained from a combined approach. Parsons's emphasis on the organism as the unit of selection is also welcome because it comes at a time when discussion of levels and units of selection is intense. However, Parsons