

Book Reviews

Birds

Avian Biology. Vol. 1. DONALD S. FARNER and JAMES R. KING, Eds. Kenneth C. Parkes, taxonomic editor. Academic Press, New York, 1971. xx, 386 pp., illus. \$30.

No other animal group enjoys the massive and diversified following of birds: on the one hand there is an army of amateur field workers, on the other biologists who work on birds because they are the best group in which to investigate certain fundamental biological problems. It is not surprising, accordingly, that birds have contributed to a disproportionate degree to knowledge in a number of areas: geographic variation and speciation, biogeography, population dynamics, systematic concepts, the study of instinct, and the biology of reproduction, especially the role of the photoperiod as a controller of this cyclical phenomenon.

In view of this the present volume, which provides reviews of the current state of knowledge on 11 different topics by leaders in these fields, will create wide interest. The work is the conceptual descendant of A. J. Marshall's *Biology and Comparative Physiology of Birds*, and the series is dedicated to this distinguished avian physiologist. There are chapters as follows: classification (Storer), the fossil record (Brodkorb), systematics and speciation (Selander), adaptive radiation (Storer), avian communities (MacArthur), sea-bird ecology (Ashmole), desert adaptations (Serventy), breeding seasons (Immelmann), population dynamics (von Haartman), adaptive aspects of reproduction (Cody), and behavioral ecology (Orians). About six of the chapters are outstanding for completeness of coverage and the comprehensive bibliography; two or three are updated versions of chapters in Marshall; only a couple (because they deal with only some phases of a subject) are a little disappointing.

In the space of a few hundred words it is obviously impossible to review the advances in knowledge in all these

fields. Of greatest interest will be the chapters dealing with ecological adaptations—on factors governing breeding, the special adaptations of marine and desert birds, factors governing clutch size, and so on. Immelmann provides an up-to-date account of the first of these. The photoperiod, so ably demonstrated by Rowan and Bissonnette to be the major initiator of periodic phenomena in higher latitudes, now gets little attention from researchers. What controls breeding in the tropics, where the photoperiod is relatively constant, proves to be just as open a question as it was when John R. Baker first drew attention to the problem. Certain generalities can, however, now be made: lowland forest birds inhabiting areas of heavy annual precipitation tend to concentrate their breeding into the drier months; birds inhabiting areas with two wet and two dry seasons may, according to the species, breed twice a year or nest during the short rains but not the long rains. The erratic nature of breeding in desert birds is now well documented. Many Australian desert species have developed the remarkable capacity to respond to rain within a few days, but this capacity (for some unknown reason) is largely lacking in southern African desert species. It is interesting to note that, despite a generation of experimental research into the photoperiod as an initiator of breeding, physiologists (unlike the birds) have not responded to the possibilities of rainfall. The "physiological pathways" whereby this affects the bird remain unstudied. The role of "endogenous periodicity," or internal rhythm, as an initiator of periodic phenomena in birds remains controversial; its occurrence has, however, now been conclusively demonstrated in one species (by Serventy and Marshall), the transequatorial sea-bird migrant, *Puffinus tenuirostris*. Last, we are no further ahead in our understanding of an equally tantalizing aspect of reproduction, what *stops* the process, than we were twenty years ago.

Serventy's chapter on deserts is an

excellent review of specializations and adaptations for life in the world's most extreme habitat. Breeding may be denied for long periods, and population crashes occur periodically. Birds have two alternative ways of handling the unpredictable desert environment: vacate the area when conditions start to decline (a nomadic way of life is one of the major adaptations of Australian desert birds), or slug it out in situ. Some species do the former, others the latter. One of the greatest needs of resident (nonnomadic) species is a capacity to build up numbers rapidly when good conditions finally return. The Australian zebra finch has become something of an expert at this. Young birds develop spermatozoa at the age of 60 days. In the laboratory, males 6½ weeks old and females 9½ weeks old have begun nesting and birds 11 to 12 weeks old have been successful in raising broods. And laboratory pairs of zebra finches have raised up to 23 successive broods of young.

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Origins of Husbandry

Geography of Domestication. ERICH ISAAC. Prentice-Hall, Englewood Cliffs, N.J., 1971. x, 132 pp., illus. Cloth, \$6.95; paper, \$2.95. Foundations of Cultural Geography.

Domestication is a popular scientific subject, and, as is typical of fads, each explication becomes a distinct genre. *Geography of Domestication* is no exception. Its basic arguments are that domestication occurred first in the Near East, that religious beliefs and practices were prime motivating forces in the domestication of plants and animals, and that diffusion brought the idea of domestication and its by-products to Europe, Africa, Asia, and perhaps to the New World. These conclusions are somewhat startling, quite controversial, and stimulating.

Isaac assumes that domestication originated in the Old World; thus he accords the Western Hemisphere scant attention. Within the Old World he attempts to demonstrate by selecting archeological, historical, and ethnographic evidence that no matter which traits are chosen—myths, harnessing methods, megaliths, fortifications, irrigation, terracing, or the plants and animals themselves—the Near East, not Southeast Asia, is where domestication