

## Natural Regulation of Animal Populations

Edited by Ian A. McLaren. 1971. Atherton Press, New York. 195 pp. \$3.25.

It may seem strange that in these days of systems analysis and computer simulations, a collection of papers debating the pros and cons of population regulation and the role of density-dependent processes should appear for the first time. These topics are, of course, touched on in other collections, particularly Kormondy's *Readings in Ecology* (1965) and Hazen's *Readings in Population and Community Ecology* (2nd edition, 1970) but neither provides as thorough a coverage of the subject as the present book. Apart from the choice of papers which is appropriate, the chief virtue of this slim volume is the succinct, analytical introduction in which McLaren sets the stage and places each of the contributions in the context of the broader literature dealing with population control. This should be useful to any student of ecology, but readers should be warned that the uninitiated may find the going rather difficult. Following a brief explanation of Lotka's classical equations, McLaren takes the reader through density-dependence and density-independence, social regulation of populations and genetic aspects of regulation.

It seems a little unfortunate that the reader is spared the colorful if somewhat polemical prose of the original protagonists in the density-dependence controversy but their writings can be sampled readily in the 1957 volume of *Cold Spring Harbour Symposia on Quantitative Biology* and references included in the introduction and following the papers in the present book. These early

arguments are illustrated and clarified in papers by Solomon and Schwertfeger. A more recent analysis by Horn is included and empirical evidence of density-dependent processes is assembled in Tanner's paper.

The notion that populations are regulated through intraspecific processes affecting the quality and behavior of animals is discussed from several conflicting viewpoints. Thus Christian and Davis emphasize physiological changes in individuals associated with crowding, while Chitty, in a careful analysis of what constitutes critical evidence of regulatory mechanisms, proposes that the quality of individuals in fluctuating populations changes through natural selection. Wynne-Edwards postulates that mechanisms limiting birth rates have evolved by selection between populations and these ideas are criticized in a paper by Wiens. Finally Pimentel's article discusses population regulation through genetic feedback involving two or more species.

The problems of population regulation are by no means resolved and McLaren has done students of ecology a service by providing a balanced selection of pertinent literature together with a useful critique of the field.

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## Bees, Their Vision, Chemical Senses, and Language

By Karl von Frisch. 1971. Revised Edition. Cornell Paperbacks, Cornell University Press, Ithaca, New York. 157 pp. \$2.45.

One of the "eminent founders of the new science called the comparative study of behavior or ethology" was the praise given when Karl von Frisch was awarded a share of the 1973 Nobel Prize for Physiology or Medicine. This honor alone highly recommends his writings; however this little book on bees is stimulating to read and with its other favorable features it should be of interest to all students of natural history.

The author's ability to present the problems, the methods or approaches to their solutions, and the interpretation and application of the results, in a lucid and concise manner makes the book very readable. The text is clearly printed, in large type, well illustrated and error-free.

The first chapter discusses the color sense of bees, illustrating that bees can distinguish four qualities of color

(yellow, blue-green, blue, and ultraviolet), and relates their ability to detect ultraviolet (UV) to the reflection of UV by insect-pollinated flowers. The second chapter treats the chemical senses of bees, pointing out, among other things, that their sense of smell is similar to that of human beings, and describes the simple tests used to classify the taste senses of bees. In the final chapter, which comprises nearly half of the text, the "language" of the bees is explained. The dance they do to "tell" their fellows about the presence of food at a new location is depicted and the importance of the waggle in their walk is pointed out. Finally, the bees will gain from von Frisch's studies because man has begun to entertain the idea that perhaps the bees know what they are doing.

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