

ANIMAL ECOLOGY AIMS AND METHODS, A. Macfadyen, 344 pp., \$10.00, Pitman Publishing Corporation, New York 17, 1963.

Ecology still seems to me to be more of a point of view than a science in itself. It is also so obviously overburdened with facts that one often gets lost in the details before coming to the point, but since no two ecologists agree on what the point is this may be no real handicap to progress.

The author of the present book would probably disagree heartily with me for the statements above. He states that, ". . . ecology is developing a consistent system of ideas and principles which not only justify its recognition as a distinct science, but which are also heuristically successful in producing results."

Like most ecology texts, however, much of the book is devoted to methods, and the results are often so compressed as to be meaningless. The methods outlined cover the various systematic approach to ecology. In the author's words, "These five tools, the statistically valid census, the measurement of inter-population forces, the measurement of population growth rates, the measurement of energy flow in communities and the method of ecological survey, have a number of factors in common. They all measure properties not of individual animals, but of populations, they provide the parameters of 'synecology' as opposed to 'autecology,' and they are certainly not limited to the study of individuals."

I suppose that some of my disillusionment with modern ecology stems from the fact that these techniques have relegated me, along with many other older workers who once thought of themselves as ecologists, to the category of "naturalist observers." That many results of modern ecological studies, elaborately and painstakingly carried out, hardly seem worth bothering about must surely be a personal point of view. To gain precision many of these studies seem to be concerned with no evident reality at all, but merely outline the actions of an unpredictable complex of chance factors on some imaginary populations. Perhaps this is all we can hope for in the end—pure abstraction. Three-cushion billiards is another interesting game.

Again the author would probably disagree. In recent years there has been a very important cross-fertilization of ecology with mathematics and other disciplines. To quote again, "The traditional barriers are falling and the whole subject is coming to share a system of ideas which not only justify the contention that ecology is a biological science in its own right, but provides the present-day biologist with an intellectual experience which can hardly have been enjoyed since the great days of genetics in the 1920s and

before that, Darwin's introduction of Natural Selection."

None of the above should be construed as criticism of the present book. It is in many ways an excellent synthesis of ecological facts, theory, and practice. It is full of excellent suggestions and useful outlines of methods. It only seems sad that no one seems to try them.

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BOOKS ON AQUATIC BIOLOGY, FRESH WATER AND MARINE, Carl R. Keeler, 233 pp., Facile Press, Florida, 1965.

This is a useful compilation of books related to aquatic biology, but any reader should be aware that it is not a complete list and that it is just a source where one might begin. It is a book for the amateur rather than for the specialist. There are a number of misspelled words and typographical errors. These could be corrected if another "printing" is made.

Some book lists on parasites and other subjects are included. This goes somewhat beyond the title of the book and certainly is not comprehensive for parasites and some of the other subjects.

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PROGRESS IN OCEANOGRAPHY Vol. 3, Mary Sears, Ed. 407 pp. \$15.00. Pergamon Press, New York, 1965.

This volume in the series is dedicated to pioneer marine investigator Hans Pettersson and written by many of his former students and associates on subjects which reflect his and their wide array of competences in the field. The product is an assemblage of quite specific and technical reports, largely concerned with physical aspects of the marine environment. The 30 papers in one volume preclude any of the larger monographs found in the earlier volumes. Geology, geophysics, geochemistry, and hydrography topics comprise 24 of the 30 papers. Only two are primarily biological in scope: a paper on barnacle ecology by Barnes and Barnes, and one on depth patterns of benthonic Foraminifera by Phleger.

To some extent, this emphasis on physical oceanography reflects the current urgency of investigative effort and grant support. The results are reflected in these papers, many of which illuminate the advances in and changing fundamental notions about such things as submarine geology and geophysics. The chemistry