

BOOK REVIEWS

THE DISTRIBUTION AND ABUNDANCE OF ANIMALS, by H. G. Andrewartha and L. C. Birch, 1954. University of Chicago Press. 782 pp. Price \$16.50.

INTRODUCTION TO THE STUDY OF ANIMAL POPULATIONS, by H. G. Andrewartha, 1961. Methuen, London. 281 pp. Price £1 10s. 0d.

As the first of these books was published ten years ago, I assume I have been asked to review it because the editor feels that its immediacy has not diminished with time—an opinion with which I agree. But the book cannot be considered entirely outside the context of its publication date. It appeared at a time when the division of environment into density-dependent and independent factors was an entrenched doctrine of ecology, having all the characteristics of an established religion complete with high priests and acolytes. The orthodox concept of ecology at that time can be crudely summarized as follows: "All animal populations are kept in check by factors whose restraint on the growth of a population is directly correlated with the population's density. Only such density-dependent factors can regulate a population. The role of density-independent factors is restricted to determining the level at which the density-dependent factors inhibit further increase. The function of research in population ecology is merely to isolate in each case the limiting factor involved. Failure to find this factor is symptomatic of either sloppy research technique or of inadequate time spent on the project." This is a parody but not a gross one; the baffle-gab is authentic.

Andrewartha and Birch assault this concept of ecology with 720 pages of argument, reinforced by 750 references, claiming that at best it is an oversimplification and, at worst, naïve nonsense. They argue that the assumption of populations being regulated within narrow limits is not confirmed by empirical observation, that populations are not invariably adjusted to the prevailing environment, and that the division of environment into density-dependent and independent factors is arbitrary and meaningless.

The book touched off a polemical war in comparison with which the debate on Luther's thesis was a friendly discussion over tea and biscuits. The authors were accused of advocating a nature in chaos, a charge which suggests that such critics did not persevere beyond page 650. In fact, the book outlines three situations, illustrated with examples, which would regulate populations:

- (a) The shortage of a necessary resource in which the use of this resource by some individuals denies it to others.
- (b) The inaccessibility of a resource relative to the animals' ability to search for it.
- (c) A fluctuating environment which does not allow a population to increase for any length of time.

In short, the authors view nature as being in a continual state of change where time and chance are real entities. They review a large

number of ecological studies in the light of this concept to obtain a synthesis which, if not as beautiful as the density-dependent model, is at least more credible.

The second book is characterized in the preface as "a compact text that students may use". It is divided into two parts, the first being a précis of Andrewartha's and Birch's concept of ecology, as given in the book reviewed above. A few examples are added from research published since 1954 but several of the original chapters (unfortunately, some of the most interesting) are not touched upon.

This section is followed by a laboratory course for students in ecology. A research worker may feel that this part of the book cannot offer him much, but it is very useful as a rapid reference work on research procedures. Although it is concerned with laboratory populations, it deals at a fairly advanced level with most of the problems of experimental design and analysis faced by the field ecologist. If Andrewartha's students can cope with this course, he must be blessed with a particularly earnest and erudite class.

G.C.

WILDLIFE INVESTIGATIONAL TECHNIQUES, edited by Henry S.

Mosby. 2nd ed. 1963. Wildlife Society of America. xxiv+419 pp., 168 figs., 124 tables. Price \$4.50.

This large volume, first published in 1960 under the rather misleading title of *Manual of Investigational Techniques*, has run through two printings and two editions in three years. This gives some idea of the demand in North American universities and colleges for a textbook of this kind for the many and varied (both in quality and quantity) wildlife management degree courses and wildlife research institutes.

The reviewer would be surprised to see this 400-page book on the desk of any New Zealand forester, and even more surprised if he had actually read it. However, the book is of some interest to those of us who have an animal bent, even though many of the techniques discussed are of little use for animal research in this country.

In this volume, the work of 8 American and 2 Canadian wildlife authorities, is a summary and description of the best-known field and laboratory techniques currently being applied in the management of game birds and mammals. An attempt is made, not to catalogue all techniques, nor to prescribe any single standardized procedure, but rather to report and illustrate methods that have been found of value.

The authors have sifted the voluminous wildlife literature up to 1962, plus the unpublished contributions of many individuals. The contents include consideration of instrumentation in wildlife research, record keeping, reconnaissance mapping, habitat evaluation, estimation of animal numbers, criteria of age and sex, population analysis, methods of preservation, post-mortem examinations, capturing and marking techniques, measures of mortality, control of nuisance wildlife, food habits procedures, project planning, use of wildlife literature, and the reporting of research results.

There is also a glossary of terms frequently used in wildlife work and in ecology. The appendix has tables on the hatching success of game birds, clutch size of game and predatory birds, the gestation periods of selected American mammals, and a list of North American