

Birds

The Status of Birds in Britain and Ireland. Edited by D. W. Snow. Prepared by the Records Committee of the British Ornithologists' Union. Pp. xviii+333. (Blackwell: Oxford, London and Edinburgh, 1971.) £3.75.

THIS work is the greatly improved successor to a series of editions of the so-called "British List" issued under the same auspices from 1883 to 1952. The whole concept of an "all-or-nothing" list has been criticized as unscientific; now a beginning has been made towards dividing the species into categories. In my opinion the general category "A" is still too wide; but there is a welcome approach to subdivision in the use of standard indications of status and abundance. This time, the members of the responsible committee have not set themselves up as arbiters on questions of taxonomy and nomenclature but have wisely followed specified authorities.

The great value of the book lies in the fuller information now given about the world distribution of each species and, still more, in the carefully ascertained details of current status in the British Isles, including internal incidence, abundance and movements. The result is an up-to-date picture of our avifauna which should well serve current needs and also provide a base-line for future studies.

The publication is authoritative not because it is "official" but because it represents the labours and corporate judgments of a band of experts over several strenuous years. They are to be congratulated on the outcome of their labours. The volume is pleasantly produced; and each familial section is headed by a drawing of a selected species by Robert Gillmor.

A. LANDBOROUGH THOMSON

Taxonomy Rationalized

Mathematical Taxonomy. By Nicholas Jardine and Robin Sibson. Pp. xviii+286. (Wiley: London and New York, September 1971.) £6.

THIS is an important book. The authors have contributed substantially to numerical taxonomy in recent years and in this book bring together and organize much of their published work as well as advancing several important new concepts. It is a pity, therefore, that the organization and presentation of the material have not been more successful. Numerous new terms are introduced throughout the book, often without adequate initial definition. Jardine and Sibson frequently use esoteric terms and abbreviations with little mnemonic value

(examples are D-dissimilarity, B_k clustering, C_u methods) which will not help readers in assimilating the material. The development is highly technical. Numerical taxonomists will need to spend considerable time working through the material but their efforts will be richly rewarded. Even where they do not agree with some of the authors' assumptions or conclusions, the new insights presented will be of considerable value in testing their own ideas. I can attest to the seminal effect of this book on my colleagues.

The book is divided into three main sections and appendices. The first deals with dissimilarity measures, the second with clustering methods and the third discusses the principles of mathematical and biological taxonomy. The authors arrive at an information theoretical similarity measure and recommend single link clustering as the method of greatest mathematical appeal, while realizing its serious drawbacks. This latter recommendation leads me to retain some reservations about the conditions laid down by Jardine and Sibson for clustering methods.

The third section is a gem. Nowhere have I seen the problems of modern biological taxonomy dealt with so clearly in so limited an amount of space and with such good sense. I am only fearful that its placement as the third part of a book which is highly mathematical in its first two parts will keep it from its deserved large audience of biological taxonomists, who may be apathetic or inimical to the earlier two parts. It is clear that the authors belong to a new generation. None of the philosophical and emotional problems of earlier taxonomists are evident in the discussion. The absurdities of biological species (*sensu* Mayr and Dobzhansky), cladism (*sensu* Hennig), or phylogenetic weighting (*sensu* Mayr) are exposed as virtually self evident. Extreme pheneticism is equally criticized. The authors conclude that for most supraspecific groups phenetic taxonomy is probably the best system and that at the infraspecific levels hierarchies should be avoided.

Many of the appendices might have been omitted. The Fortran listings of computer programs are of little use because they use machine language sub-routines. They are also far too long for reproduction by keypunching, especially in view of the fact that they and certain statistical tables developed by Jardine and Sibson are reproduced so poorly as to make them hard to read. Two examples of actual classifications carried out by the methods of these authors are useful but not detailed enough. It will take fairly accomplished numerical taxonomists to compare these methods usefully with other established techniques.

In spite of some of these shortcomings the significance of this book for the future development of taxonomy should be obvious to any serious reader.

ROBERT R. SOKAL

Polymer Mechanics

Mechanical Properties of Solid Polymers. By I. M. Ward. Pp. xv+375. (Wiley: London and New York, December 1971.) £7.

PROFESSOR WARD'S book is a welcome addition to the literature on the mechanical properties of polymeric materials, and reflects the growing interest in polymers as engineering materials. Although there have been previous books on the same general topic, this volume introduces a more rigorous treatment which will be welcomed both by those who teach the subject and those engaged in the areas of research or application.

The coverage is comprehensive, with chapters on structure, the rubber-like state, linear visco-elasticity, visco-elastic measurements, mechanical relaxations, non-linear visco-elasticity, anisotropic behaviour, yield and fracture. Some of these topics, of course, individually form the subject matter of established texts, and readers familiar with those books may not gain much that is new from the necessarily restricted coverage of a chapter or two in the present volume. To criticize the book on that score would be to miss its point, however. Professor Ward has provided one of those single-authored, synoptic treatments which are at once both rare and valuable. As an exposition of basic principles; as a summary of current knowledge; as a teaching manual and as an introduction to polymers for the scientist or engineer not trained in the field, the book fully achieves its objectives.

The author's viewpoint is strictly a continuum one. That is to say that solid polymers are considered almost exclusively as continuous media or else as homogeneous molecular assemblies. There is therefore little treatment (except for a few paragraphs in the "structure" chapter and elsewhere) of polymer morphology and its effects on mechanical properties, which can be profound. This omission is clearly deliberate, and it must be agreed that a polymer equivalent to a physical metallurgy or mechanical metallurgy text calls for another book rather than an expansion of the present volume.

It would have been valuable to have had a short bibliography, or suggestions for further reading, at the end of each chapter in addition to the references.

The book is very readable and well produced with good diagrams, and the mathematics are set out clearly.

E. H. ANDREWS