Thermoelectricity

Thermoelectricity in Metals and Alloys. By R. D. Barnard. Pp. x+259. (Taylor and Francis: London, November 1972.) £6.50.

It is more than ten years since the late D. K. C. MacDonald published a splendid monograph on thermoelectricity in metals and alloys. Whilst there have not been any dramatic advances in the subject since then, a new monograph can certainly be justified on the grounds that the intervening period has been one of consolidation. Our understanding of the thermoelectric power of metals is now in a very satisfactory state; in particular, at high temperatures, the dominating influence of the energy dependence of the scattering cross-section (rather than detailed consideration of Fermi surface topology) has led to a unified theory which covers solids, liquids and alloys. Dr Barnard has covered the literature very adequately and his presentation of a mass of new material has ensured that the underlying unity of the subject has been preserved. I was particularly impressed with chapters 4 and 6 which cover a whole range of high temperature effects from a standpoint based on electron scattering. The remaining chapters cover the basic "classical" theory (chapters 1, 2 and 3), the ideas behind the concept of phonon-drag (chapter 5) and a general review of thermoelectricity in metals and alloys, particularly those in which the d-bands materially affect the experimental results.

One criticism: I should have liked to see a little on those cases where the basic formulation is beginning to break down, for example, low density Hg or alloys in which the mean free path is short. This area of condensed matter physics is not well understood and a short account of some of the recent experiments would, I think, round the book off rather nicely.

But, this minor point aside, I found Dr Barnard's book very readable and it will be useful to academic staff and research students who have to lecture on or research into thermoelectricity and its associated phenomena.

J. E. ENDERBY

Classic Ecobotany

Stålfelt's Plant Ecology: Plants, the Soil and Man. Translated by Margaret S. Jarvis and Paul G. Jarvis. Pp. x+592. (Longman: London, December 1972.) £5.50.

THIS translation of the classic treatise on plant ecology by the late Professor Stålfelt, of Lund, has placed in the hands of British ecologists an introduction to an extensive continental literature on the subject. In many respects

Stålfelt was ahead of his time, for he anticipated the development of ecosystem theory and its application to agriculture, forestry and the maintenance of stability in the natural environment.

The emphasis of the book is upon the interaction between plant and soil and it has a distinct bias towards the applied branches of ecology, which is rather refreshing when so many modern texts are exclusively theoretical.

Although the translation reads well, it is sad that more recent work was not incorporated. Of the seven hundred references in the bibliography, only about forty are later than 1960. As a reference text for undergraduate teaching it also suffers the disadvantage of being exclusively botanical when many introductory ecology courses are now integrated botany and zoology. It will provide a useful introduction to plant ecology for undergraduate students of agricultural botany and forestry, although even in its coverage of these fields there is an evident neglect of biotic factors, for example competition and grazing. One wonders whether the translators would have been more profitably employed in writing a new text based on Professor Stålfelt's work.

PETER D. MOORE

African Avifauna

Birds of West Central and Western Africa. By C. W. Mackworth-Praed and C. H. B. Grant. Volume 2. Pp. vi+818+plates 47-93. (Longman: London, April 1973.) £8.

THE surviving author is to be congratulated on the completion of an ambitious project for covering the whole of Africa south of the Sahara with a uniform system of ornithological textbooks. There are three series, each consisting of two volumes, and these deal respectively with eastern and north-eastern Africa, with the southern third of Africa, and with west central and western Africa. There is of course some overlap of species but each series is complete in itself. The first series opened in 1952 and ran into a second edition; the second appeared in 1962-63, and the earlier volume of this series came in 1970. Captain Grant died in 1958, but by then he had put in many years of preparatory study at the British Museum (Natural History) and had laid the foundations, especially as regards taxonomy, of the whole work; he is thus fittingly regarded as joint author even of this final volume.

The area covered by the third series is larger than that usually denoted by the term West Africa, and extends from southern Mauritania to northern Angola, as well as eastwards to the borders of the Sudan, Uganda and Tanzania. This second volume includes all the pas-

serine families except the larks. There are 736 species, some with several recognized races, and each of the latter receives separate treatment. For each, as before, brief particulars are given of distinguishing characters, distribution (with marginal map), habits, nest and eggs, recorded breeding and call. The colour plates figure every species except a few for which drawings have been considered sufficient.

There are some excellent books, of various dates, on the birds of particular parts of Africa; and there are important recent works making a broad biological approach to the whole avifauna. But as a systematic basis for study of the birds of the Ethiopian Region the six volumes of Mackworth-Praed and Grant have no equivalent.

A. LANDSBOROUGH THOMSON

Oxide Films

Oxides and Oxide Films. Edited by John W. Diggle. Volume I. Pp. xiii+537. (Marcel Dekker: New York, November 1972.) \$27.50.

THIS book is the first of a series to be devoted to the general field of the anodic behaviour of materials. The introduction by the editor shows the extent of the aim, which can fairly be described as electrochemical in its bias.

There are to be four volumes on oxides and oxide films, each containing four lengthy reviews of particular topics. The editor acknowledges that some reviews, peripheral to the main topic, will not be electrochemical and one may cite in this area for example "Dielectric Loss Mechanisms in Amorphous Solids" (to appear in volume 2). It does seem unfortunate that the editor has not thought it necessary to find a title of each volume which describes the contents more precisely. The present one is not incorrect but which oxide films? The corrosion films on iron and steel, or the magnetic films used in computer memories, or what?

This first volume opens with an article by V. Brusic on Passivation and Passivity in which passivation phenomena are discussed and the characteristics of the active and passive states are presented. There follows M. J. Dignam's article on Ionic Transport Mechanisms through oxide films. The various mechanisms by which the migration of a charged carrier can occur are studied and applied to chosen problems such as vitreous metal oxides. C. A. Mead has contributed an article on Electronic Current Flow Through Ideal Dielectric Films, relating this to thermionic currents in diodes and in semiconducting and insulating films. The final article, by S. M. Ahmed, is on the Electrical Double Layer at Metal Oxide-Solution Interfaces, presenting an extensive review of published work. Each article