

the authors are not too familiar with modern theoretical or experimental physics.

Dr. Prata's book on fission is on a different level altogether. It attempts to summarize the work published on this subject up to 1943, to which is added a brief abstract of the Smyth report. While the preface does not explain the history of the book, one gains the impression that the manuscript must have been ready some time before the news of the atomic bomb was released, and that the final chapters were added later. However that may be, this book is not one of the many superficial accounts that are trying to exploit the publicity value of atomic energy; it is a serious piece of work intended for the physicist who has kept up to date in modern developments and wants to collect the information on fission without going through all the original papers. A first historical chapter reconstructing the steps leading to the discovery of fission is followed by chapters on fission products, on the energies and masses of the fragments, their passage through gases. A chapter on the theory gives a very readable account of the stability calculations and an outline of the Bohr-Wheeler theory which is somewhat less successful. A chapter on secondary neutrons, a brief mention of Feather's proof of instantaneous fission, and a discussion of data on cross-sections conclude the review of the older literature. The rest of the book consists of a short summary of the Smyth report on the American project, and an almost complete bibliography up to 1943.

This bibliography and the comparative discussion of the early papers will remain useful even though the release of American, British and Canadian work from secrecy is bound soon to make this book obsolete as an account of current knowledge. The author has missed a few points in the Bohr-Wheeler theory and one or two major ones in the Smyth report, but otherwise the book is instructive, and, for the physicist with some knowledge of nuclear physics, very readable.

R. E. PEIERLS

BIRDS OF NORTH AMERICA

Audubon Bird Guide

Eastern Land Birds. By Richard H. Pough. (Sponsored by National Audubon Society.) Pp. xxxvii+312+48 plates. (New York: Doubleday and Co., Inc., 1946.) 3 dollars.

ORNITHOLOGICALLY speaking, North America is divided into four areas—western, eastern, middle America and the West Indies, the largest being the eastern one that includes the Atlantic seaboard. Mr. Pough writes of the birds of this area under the title of "Audubon Bird Guide—Eastern Land Birds". He deals with the 275 species of land birds found in eastern North America in a concise manner, most helpful to the recent recruit to ornithology. His remarks under the heading of "Identification" are excellent, for he seizes on the outstanding characteristics of each species and tells the field worker what to look for. The colour portraits are also good and helpful, though it is to be regretted that no indication of scale accompanies them. If one did not know otherwise, one might imagine that the snowy owl is no bigger than the English sparrow, the picture of which is most life-like; however, in most cases all birds on a plate are drawn to the same scale.

The foreword will be read with appreciation by ornithologists of both New and Old Worlds, for it contains much of interest and many practical common-sense hints for the beginner, also he who no longer comes under this heading. The remarks on psychology and behaviour give food for thought. "The study of birds has been greatly handicapped by a tendency to interpret their behaviour according to human standards. This is a mistake. Birds are creatures of instinct, and the whole pattern of their lives is determined in advance by their inheritance. They have no power of thought as we understand it. Apparently a newly hatched bird inherits everything it needs to carry out every step in its life cycle, even when it includes long migration flights, elaborate nest-building, or any one of hundreds of other equally complex performances." The author goes on to say, "Birds are no less fascinating because they act like automatons; that is, like birds instead of people".

Although Mr. Pough is certainly correct regarding the birds' inherited patterns of behaviour, maybe his generalizations are somewhat too sweeping. For example, anyone who has had dealings with a tame raven will find it difficult to dispense with the word 'intelligence' in any analysis of its conduct. Is it automatonism when it tweaks the cat's tail?

FRANCES PITT

PLANT TISSUE CULTURE

Une voie nouvelle en biologie végétale

La culture des tissus. Par R.-J. Gautheret. (L'Avenir de la science, No. 21.) Pp. 202+32 plates. (Paris: Libr. Gallimard, 1945.) 190 francs.

THE technique of culturing animal tissue *in vitro* has, on many occasions, received considerable publicity. No comparable public interest has been centred on the cultivation of plant tissues, yet in many ways the results have been at least as important. In animal tissue culture the media used have normally contained tissue extracts and serum, and attempts to produce purely synthetic media have so far met with little success. Media used in plant tissue culture, on the other hand, have in the main been synthetic, and it is not surprising, therefore, that successful continued proliferation of undifferentiated plant tissues *in vitro* have been achieved only within the last eight years. Most of the successful advances have been made in France or the United States, and in the former country the technique has been developed primarily by R.-J. Gautheret. It is, therefore, with considerable interest that one turns to his account of the subject.

After a historical introduction, the writer discusses the principles and problems of the techniques used, and then goes on to consider the morphological characters of the cultures obtained. Chapter 4 deals with the problems of the physiology of the growing tissues, and the final chapter with the possibilities of the technique.

The account of the methods and results is admirable, and the work is well illustrated with excellent plates and good figures; but the deliberate omission of references detracts considerably from the book and tends to damp interests stimulated by the text. Gautheret has made it abundantly clear that the cultivation of plant tissues has immense possibilities, and although many difficulties remain to be surmounted the future of the technique is assured.

ALAN BURGESS