Among articles in the 1953 volume dealing with plant metabolism, apart from those already mentioned, is one by J. G. Wood on the nitrogen metabolism of higher plants in which recent work on the path of nitrate reduction and protein synthesis in plants is adequately summarized. Another aspect of plant metabolism attracting much interest at the present time, namely, the part played by organic acids in metabolism, is ably reviewed by R. H. Burris, while the important question of the use of respiratory inhibitors is exhaustively dealt with by W. O. James, who refers to no less than 247 contributions bearing on this subject. A valuable review on haematin compounds in plants is the work of R. Hill and E. F. Hartree. This includes an account of the distribution of haematin compounds in plants with some remarks on the possible part played by these substances in photosynthesis, a discussion on the cytochrome system as a terminal oxidase in plant respiration, the role of this same system in salt respiration, the function of haemoglobin in the root nodules of the Leguminosae, and an account of recent work on catalase and peroxidase.

Reviews concerned with the popular topics of growth substances and herbicides are contributed by H. Veldstra and A. S. Crafts respectively, while the physiology of fruit growth, a subject about which not a great deal is known, is dealt with in a stimulating review by J. P. Nitsch.

The remaining reviews which make up the 1953 volume are on the physiology of mycorrhizal relations in plants by E. Melin, the effect of temperature on plant growth by F. W. Went and the physical properties of protoplasm by H. I. Virgin.

The enormous amount of literature reviewed in a single volume and the high standard maintained generally by the various contributors make these annual reviews a most valuable addition to the literature of plant physiology. They are, indeed, a necessity to the plant physiologist who means to keep abreast of advance in knowledge of his subject.

W. STILES

RECENT ADVANCES IN SPELEOLOGY

British Caving

An Introduction to Speleology. Edited by C. H. D. Cullingford. Pp. xvi+468+48 plates. (London: Routledge and Kegan Paul, Ltd., 1953.) 35s. net.

THE publication of this book marks a conspicuous advance in the study of British caves and shows that modern cave exploration must be regarded as something more than a 'sport'. Hitherto, much material of scientific value about limestone caves has remained either unpublished or hidden away in the little-known journals of local caving clubs. The collection of this scattered information, together with an introduction to the many problems with which caving is concerned, has now been attempted by fifteen members of the Cave Research Group. This Group was formed in 1947 to further "the study of all scientific aspects of cave exploration"; "British Caving" is the Group's first major publication, and is also the first book to cover comprehensively the chief aspects of British caves and caving. Its aim is twofold; first, to give an account of the recent work on caves and the advances in caving techniques;

secondly, to provide, for the rapidly growing numbers of cave explorers, with little or no scientific training, both a guide to the organization of caving and to scientific methods of observation.

The book is divided into two parts. Part I is the larger and is called the "Science of Caving". In this part, Dr. Warwick summarizes the many problems connected with the origin of limestone caves and with the relationship of the caves to the surface land-forms; he also contributes a chapter on the main characteristics of the caving regions of the British Isles. Dr. Wilfred Jackson's contribution is a detailed account of the British caves from which archaeological remains have been obtained; its value is mainly bibliographical and the chapter contains an extremely useful list of the museums where the various 'cave finds' can now be examined. Miss Hazelton and A. E. Glennie have written a section on how to observe and to collect cave fauna and flora; a comprehensive list of the fauna and flora so far recorded from caves in the British Isles is also included. A fascinating chapter, illustrated by a series of fine photographs taken by J. D. H. Hooper, describes the studies now being made in south Devon on cave-dwelling bats. Chapter 7 briefly mentions certain physical aspects, such as air currents and temperatures, the tracing of water-flow under ground and geophysical methods of locating caves. Finally, there is a chapter on the caves associated with lead mines; this is, however, rather slight and is in many ways not up to the general scientific standard of this part of the book.

Part 2 deals with the "Practice of Caving". There is a short note on the history of cave exploration and this is followed by discussions of the equipment and of the procedure and safety precautions necessary in any cave investigation. The chapter, by F. G. Balcombe, on the history and work of the Cave Diving Group is one of the most exciting stories to be told in modern caving. Part 2 also contains clearly written instructions and suggestions on cave photography and on cave surveying. An appendix gives a list of the caving organizations in the British Isles and a glossary of some of the terms used in connexion with caves and limestone areas.

The book is very readable, though as might be expected in a compilation there is considerable unevenness in the treatment of the different topics, and occasionally an incongruous mixture of styles. Moreover, the book covers a field so wide that unavoidably many geological and other problems have to be over-simplified. Full bibliographies at the end of each chapter partly overcome this defect. Many of these bibliographies would be of greater use if they were more selective; since, also, the literature about caves is of very varying quality, annotation would help the beginner both to acquire the basic scientific knowledge and to discriminate between the useful and less useful references. The reviewer also regrets the substitution of the American words *vadose* (above the water-table) and *phreatic* (below the water-table) for the English terms long in use by British geologists.

"British Caving" is well printed and produced and contains about eighty photographs and many clearly drawn maps and diagrams. The book is indeed a tribute to the amount of solid work put in by the Group; it should introduce many, as its writers hope, to the wonders of limestone caverns, but what is probably more important is that it should establish speleology as a well-defined branch of modern natural history.

M. M. SWEETING