Actually, colour matches differ from one observer to another very much as if a yellow filter of differing density had been introduced, hence the argument for the yellow macular pigment.

Yet difficulties do remain, and we can still be grateful to the authors of this monograph for their ruthless exposure of some of the fallacies of the pigmentary theory of Maxwell's spot without necessarily accepting all their arguments and conclusions.

W. D. Wright

TEXT-BOOK OF PLANT PHYSIOLOGY

Principles of Plant Physiology

By James Bonner and Arthur W. Galston. (A Series of Biology Texts.) Pp. x+499. (San Francisco: W. H. Freeman and Co.; London: Bailey Bros. and Swinfen, Ltd., 1952.) 5.50 dollars; 47*s*.

DESPITE (or perhaps because of) the rapid progress during the past twenty years in the elucidation of plant physiology, text-books in this field of natural knowledge have remained notoriously few and far between. The appearance of a new one is thus an event of unusual interest.

This new volume, originating chiefly from the California Institute of Technology, is distinguished especially by the excellence of its treatment of the more biochemical aspects of the activities of the plant, and there are admirable chapters on photosynthesis, carbohydrate metabolism, respiration, nitrogen metabolism and enzyme action. The capacity and enthusiasm of the authors are, however, by no means exhausted by their labours on nutrition and metabolism, as is shown when they proceed, in the last third of the book, to give a stimulating and authoritative treatment of growth and development, in which the plant hormones, tissue culture and photoperiodism receive especial attention.

In general the information provided is thoroughly up to date, and, though references are not cited in the text, a short list of sources is appended to each chapter. The book as a whole is written at a level approximating to that of a general degree course in botany, but in biochemical and some other aspects the standard of treatment is nearer to that of a special course. Omissions that may be noted include a failure to attempt an adequate explanation of root pressure, or to mention frequently observed phenomena such as guttation, nastic movements, haptotropism or nutation. Minor objection could be taken to a preliminary statement on p. 11, which might be interpreted to mean that the oxygen of photosynthesis originates from carbon dioxide—the correct position on this is of course clearly indicated later in the chapter—and also to a slight uncertainty in the text as to whether or not the authors intend photosynthesis to be reckoned as a part of the metabolism of the plant.

In contrast with most other text-books on plant physiology, this one is copiously illustrated by means of drawings, diagrams, cartoons and graphs, to a total of 218. Many of these are excellent and some decidedly novel, such as that in which the familiar Askenasy apparatus is depicted as seen obliquely from above. But a few of the illustrations fall below the high standard set by the text. Fig. 11–9, purporting to illustrate the legume root nodule, is decidedly crude. The diagrams referring to plasmolysis fail to accord with the text in that they show no overall shrinkage in the size of the cell. The seedlings portrayed in Fig. 14–4 and stated to be "beans" seem more likely to be those of a cucurbit.

These minor criticisms do not detract significantly from the assessment of this new work as a notable achievement. It is written in a lucid and interesting style, and is printed in a large, easily read type. A first reading has yielded only a single misprint. In so far as the rather high price permits of it, this text-book should be in the hands of all students reading for a general or special degree in botany.

G. Bond

PLANT RESPIRATION

Respiration in Plants

By Prof. Walter Stiles and Prof. William Leach. (Methuen's Monographs on Biological Subjects.) Pp. vii+172. (London: Methuen and Co., Ltd.; New York: John Wiley and Sons, Inc., 1952.) 10*s*. 6*d*. net.

THIS little book was first published in 1932 and no monograph of plant respiration has appeared during the succeeding twenty years. It has therefore carried a heavier burden than perhaps even its authors anticipated, and, meanwhile, much has happened to the subject it describes. The foundations of the study of plant respiration were firmly laid about the start of the century, so it would be too much to say that the progress of the past twenty years has been revolutionary; but it has advanced to new levels and depends on different tools.

In preparing the third edition it has not been found necessary to alter the plan of the book, or to rewrite the first three of its four chapters, though a number of important additions have been introduced. The pages of text have been increased from 108 to 142, and 21 of the new pages are in the last chapter, which has been extensively rewritten. This is a fair reflexion of the present emphasis on the study of intermediate stages and chemical mechanisms.

The description of so complex a branch of metabolism within such narrow limits necessarily assumes a great deal of background knowledge on the part of the reader—perhaps about the amount commonly assumed in advanced lectures. It also necessitates the making of statements—such as that the end-products of aerobic respiration are the same as those of hexose combustion—without much evidence or discussion. It is presumably for the same reasons that one might be led to suppose that virtually the whole energy turnover of anaerobic respiration may be usefully transferred. To keep such difficulties within bounds, the authors have limited their choice of topics, and have in general succeeded in giving good grounds for the opinions they have adopted. While it would be difficult always to agree with them, it is good to note the caution with which they approach controversial matters. It is refreshing to find in so brief an account more than one idea of the fate of pyruvic acid and a reluctance merely to assume the identity of anaerobic respiration and alcoholic fermentation.

The changes noted in this new edition are all for the good; and, even when setting the first edition within the framework of its time, the new edition seems a better book and likely to be even more useful to students than its predecessor.

W. O. James