

## Plant pathology

THE approach of *Fundamentals of Plant-Pest Control*, by D. A. Roberts (Freeman: San Francisco and London; \$17.50; £10.20) is to try to unify all aspects of plant pest control, pointing out common features as much as possible, and culminating in the necessity for the systems approach in order to achieve integrated pest control. This is a theme of much recent thought on the subject and it is evidently right that undergraduates should study and evaluate the approach.

After a general introduction to the plant-pest ecosystem, a series of chapters reviews the structure and functioning of crop plants, followed by the dynamics of plant pest populations and the basic elements of plant pest control. The second main section reviews different types of pests, in the wide sense: microbial pathogens, nematodes, arthropods, weeds and vertebrates. Finally, the systems approach is outlined and the author concludes with his reflexions on pest control in the future.

Desirable though the ultimate objective may be, one is left somewhat dissatisfied with the book as a student text and not altogether convinced by the arguments as they stand. There is an unsatisfactory discrepancy between the potential readership of the book and the background knowledge one would expect of the reader. If it is intended for the naive reader, who has not studied plant pests in the more traditional way, then it is hard to see how he can properly evaluate the whole of the argument or cope with the use of terms like mycoplasma-like organisms or /2-chloro-4-(ethyl-amino)-6-(isopropylamino)-s-triazine/. If, on the other hand, the reader has the background, then why does he have to be given a diagram showing an elementary view of plant structure, be told that organic compounds contain carbon, or study a table setting out among more appropriate things the type of metamorphosis in stoneflies, book-lice and fleas. Such a book must surely aim to refine the understanding of a student with an adequate background, and in this sense more than a third of the text is rather unnecessary.

Leaving this aside, the sections on each type of plant pest are well structured accounts of the application of basic principles to each case. These chapters, contributed by different specialists working consistently to the author's theme, are, with the exposition of population dynamics and the

basic elements of control in the first section, the strongest section of the book. The plant pathology, entomology or weed biology student, in a context where such people are still separate, as is largely the case in the UK, will most profitably read the chapters which do not relate directly to him. The unifying approach cannot, however, always accommodate the real situation altogether. There is ultimately not so much in common between vertebrate pest control and that of nematodes as there is between the latter and plant disease control. The concepts of vertical and horizontal resistance arising from van der Plank's view of plant pathology and applying to races of host-specific pathogens and varieties of their hosts transpose rather superficially to the interactions between plant and insect species. Nevertheless, detailed differences should not submerge the most important fundamental similarities.

The systems approach of the last section is illustrated by the system "undergraduate education in crop-plant-pest control". Why, one wonders, is it not possible to illustrate it by a real plant protection system? The latter only appears in a highly condensed account of computer models such as EPIDEM. One can accept the validity of computer modelling or integrated pest control as such, but this text does not altogether convince one of the real, productive, value of the "higher systems level", or systems approach itself. Undergraduates may profitably

read this text but should keep their feet firmly on the ground and their critical faculties well in trim.

G. N. Agrios' *Plant Pathology* (Academic: New York and London, \$22.95) was in its first edition a textbook one was only too glad to recommend to students. It was invaluable for its thorough and clearly expressed accounts of selected diseases, for its abundant and excellent illustrations and life-cycle diagrams, and for the confidence with which one could advise students to refer to it as a supplement to lecture courses. It had its faults: the introductory chapters on general concepts were rather solid catalogues of information, without much feel for the essentially research orientation of subjects such as biochemical defence mechanisms; the rather limited number of diseases treated was often a problem, especially for the European user.

This new edition triumphantly corrects the latter fault, and is generally revised and brought up to date. The introductory chapters have been somewhat polished and some superfluous material has been removed. There is no doubt that this new edition is even better than the first and it can be thoroughly recommended as an invaluable teaching aid with very few reservations.

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## Plant anatomy

THE first edition of *Plant Anatomy* (Part I: Cells and Tissues) by E. G. Cutter, was published in 1969 and contained 168 pages. Now, almost ten years later (Edward Arnold: London; hardback £13.50; paperback £6.75), the 315 pages contain considerably revised and updated information while retaining the essential character of the original volume. Considerable use has been made of both scanning and transmission electron micrographs and, in general, the reproduction of these is quite respectable considering the quality of paper and method of printing. It is good to see such comprehensive revision—to the extent that transfer cells warrant a whole new chapter of their own—but it is a pity to find that some other cell types (for example, endodermis and hypodermis) are relatively very neglected. To some

extent this arises because this book is a companion to the second part (Organs) in which the endodermis, for example, is more fully described. Nevertheless, it is regrettable that while, as written in the review of the first edition (*Nature*, 222, 1100; 1969), "No cell types are omitted . . .", the degree of coverage is so variable.

This is very much a plant anatomy book with a difference: constantly probing and questioning and never very far away from the functions of the cells and tissues being described. Thus, the author is not satisfied simply to classify or to catalogue but attempts to show how the specific structures serve their different roles. Glands, and other cells and tissues, are no longer viewed simply as interesting structural aggregates but also as morphological entities that are uniquely adapted to serve their (described) function. Moreover, mature cells are not assumed to appear *de novo* and Dr Cutter takes pains to stress the subject of differentiation, both in a specific chapter where genetic control, totipotency,