

BOOK REVIEWS

Phytotoxins in Plant Diseases: edited by R. K. S. WOOD, A. BALLIO and A. GRANITI. Academic Press, London, 1972. 530 pp. £8.50.

THIS symposium volume contains the proceedings of a NATO Advanced Study Institute held in Italy in June 1970. It has taken the editors a year and a half to produce it, but this is not surprising, since it contains a total of 51 contributions. However, only 20 are review articles, the remainder being short papers, varying in length from 1 to 3 pages.

Phytotoxins, as defined by A. Graniti in the opening chapter, are microbial substances produced by invading micro-organisms, which are responsible for the toxic effect (e.g. wilting) associated with disease susceptibility in the higher plants which are being invaded. They are distinct from phytoalexins, which are synthesized by the higher plant in response to microbial attack, and from higher plant phytotoxins, substances produced by a shrubby plant or tree in order to prevent the growth of other (mainly herbaceous) plants in the vicinity. In practice, it is not always easy to distinguish between these different functions. For example, it is apparent from the cut and thrust in the recorded discussion between Stoessl and Kuć, following one of the review chapters in this volume, that the question of whether the well-known carrot dihydroisocoumarin is a phytoalexin (i.e. produced by the carrot) or a phytotoxin (i.e. produced by *Ceratocystis fimbriata*) is still an open issue.

The chapters following that of A. Graniti indicate that the phytotoxins are very variable chemically, ranging from miscellaneous terpenoids, quinonoids and amino acid derived compounds to glycopeptides and polysaccharides. The best known are undoubtedly lycoramin and fusaric acid, which cause wilt in the tomato, but a large range of other structures have been isolated and characterized in recent years. Their chemical complexity is indicated in the chapter by A. Ballio on organic chemistry, by a table showing five phytotoxins, the structures of which have been arrived at following X-ray diffraction determination.

This book is a very complete account of these phytotoxins. Following the chapters on chemistry there are accounts of their biosynthesis, metabolism and mode of action by L. Canonica, C. J. Mirocha and D. Gottlieb. Pathological aspects are expertly covered by R. K. S. Wood, A. E. Dimond and R. N. Goodman, the latter dealing particularly with the ultra-structural modifications caused in plant tissues by the phytotoxins. These excellent review chapters are followed by numerous short papers, which make up a third of the book, and I found these rather unsatisfactory. I would doubt the wisdom of the editors in including such brief reports in hard back form. However, the book as a whole provides the first comprehensive account of this area of plant pathology and is to be warmly welcomed.

University of Reading

J. B. HARBORNE