

## BOOK REVIEWS

**Progress in Phytochemistry:** Volume III, edited by L. REINHOLD and Y. LIWSCHITZ. Interscience, London, 1972. 375 pp. £9.50.

THE TEST of a good review series such as this one is whether the published articles, or a good proportion of them, will be read not just by the specialist but also by the general reader. Although Volume III of "Progress in Phytochemistry" is dominated by two topics, terpenoids and biosynthesis, I still feel that the majority of articles are written in such a way as to attract all phytochemists, not simply those working in these specific fields. The very first chapter is, in fact, an excellent general account of the methodology of biosynthesis, by S. A. Brown and L. R. Wetter. It includes a careful, thorough analysis of the many snags of interpretation in feeding experiments. There follow two chapters on the biosynthesis of specific types of plant substance: the ergot alkaloids (R. Thomas and R. A. Bassett) and the plant sterols (L. J. Goad and T. W. Goodwin). The latter review includes a most useful check-list of the 93 known plant sterols, with formulae and sources; distribution patterns are briefly discussed before the main section: an immaculately presented account of sterol biosynthesis in plants.

Plant steroids are also discussed in another chapter, by K. Takeda, devoted specifically to the sapogenins of the Dioscoreaceae; this is a rounded account of their chemistry, structural elucidation, physiology and chemotaxonomy. The last chapter on terpenoids is more strictly for organic chemists. It is on the bicyclic diterpenes, by J. R. Hanson, and it complements the same author's excellent review of tetracyclic diterpenes which appeared in Volume I of the series.

The only other chapter not so far mentioned is that by D. Boulter on the use of comparative amino acid sequence data in evolutionary studies of plants. Unfortunately, this chapter, more than any of the others, has suffered from the result of a 2-year delay between writing and publication. The main topic is the sequence of plant cytochrome *c* and a significant amount of new data has been published since this article was written. Nevertheless, this is a useful article to be read as a background to the author's more recent writings on this subject (e.g. D. Boulter *et al.* (1972) *Proc. R. Soc. London* **181**, 441-455).

This volume is skilfully edited and well produced and should be in every phytochemical library.

*University of Reading*

J. B. HARBORNE

**Fungal Pathogenicity and the Plant's Response:** edited by R. J. W. BYRDE and C. V. CUTTING. Academic Press, London, 1973. xiv + 500 pp. £8.50.

THIS is a record of the proceedings of the third Long Ashton symposium which was held in Bristol in September 1971. The symposium was concerned with aspects of physiological plant pathology and consisted of 18 papers grouped under two main headings "Fungal Pathogenicity" and "The Plant's Response", together with an inaugural lecture by R. K. S. Wood. The discussions which followed each paper are fully recorded and the closing address is also given.

The inaugural lecture on "Specificity in Plant Disease" reviewed the information currently available on pathotoxins, phytoalexins, wall-degrading enzymes and common antigens in relation to resistance and susceptibility but it was stressed that the actual determinants of pathogenic specificity still remain unidentified. Section I on "Direct Involvement of Fungal Proteins" consisted of three papers of which two dealt with the activities of pectolytic enzymes on potato and apple tissues. Improved techniques such as isoelectric focusing have provided more precise information on the activities of these enzymes which are clearly responsible for cell separation but the direct cause of death of the host protoplasts remains obscure. It was suggested that the plasmodesmata in potato tissue may be involved in the lethal effect. The third paper in the section presented results on the effect of kinetin and pigmented metabolites of *Venturia inaequalis* on spatial distribution of scab lesions on apple shoots and attributed this to hormonal control of host resistance.

Section II (two papers) dealt with "The Involvement of Ethylene". The use of gas chromatography has shown the widespread effects of low concentrations of ethylene on plant metabolism and its production by plant tissue as a general response to stress or injury require that its activities are taken into account in investigating pathogenic situations. The stimulation of ethylene production in cauliflower florets by *Erwinia carotovora* was reported to be brought about by the increase of glucose oxidase activity in the host cell walls by the action of pectate lyase from the bacterium. A general review of the involvement of ethylene in plant disease discussed the source of ethylene in diseased tissues (concluding that the host tissues are the major source), ethylene biosynthesis, ethylene as a cause of symptoms and ethylene in relation to host-pathogen interactions. The examples quoted in the paper provided evidence that ethylene is involved in a variety of ways in host-pathogen relationships.

The four papers in Section III are concerned with "Obligate Parasitism". A paper on the growth of obligate parasites *in vitro* deals with the culture on host tissue cultures and with axenic cultures. Dual cultures provide a useful means of investigating host-parasite relationships of obligate parasites but it was stressed that these relationships may not be typical of whole plants. Despite the recent successful axenic culture of rusts little appears to be known of the essential requirements for their saprophytic growth. The complex penetration process of cabbage root hairs by zoospores of *Plasmidiophora brassicae* is described in a very interesting paper. The speed at which penetration takes place and the host responds by deposition of a papilla is particularly striking. Penetration was apparently mechanical but the possibility of a package of insoluble enzymes at the penetration point was mentioned in the discussion. In the subsequent development of the amoeba in the root hair, the host nuclear response was limited in comparison with the response in gall tissue.

The third paper in this section differs from the general pattern in that E. C. Bracker