phytochemical research with a grand finale of his and other views of 'The Shape of Things to Come'.

Aromatic amino acids—phenylalanine, tyrosine, DOPA—as precursors are discussed in Chapter 1, and the exploitation of their metabolic pathways for the synthesis of compounds of known physiological and biochemical significance is considered. The authors (G. H. N. Towers and P. V. Subba Rao) usefully point out many unsolved problems and areas lacking clarification. The chapter dealing with mechanism and molecular structure of L-phenylalanine ammonia-lyase is clear and concise. Chapter 3 (M. H. Zenk and G. G. Gross) handles the reduction of cinnamic acid in fungal systems and in Chapter 4, Harborne reviews comprehensively the major sequences in the evolution of flavonoids and again the question is asked 'do all plants produce these type compounds by identical biosynthetic sequences?'. The article on biosynthesis of furanocoumarins is now obsolescent in the light of the more recent studies of S. A. Brown and D. E. Games and their co-workers.

Van Sumere and co-workers give a very detailed and complete chapter on biochemical studies in relation to the possible germination regulatory role of naturally occurring coumarin and phenolics. The article is well illustrated and data tabulated.

The complex molecule, lignin, is studied in two chapters. In one, consideration of habit, habitat, gravitational-mechanical stress are related to the process of lignification. C. Steelink, using the reactions of the hindered monohydric phenol, has ably reviewed the one electron oxidation that results in coupling, polymerization, disproportionation, quinone formation, etc. He points to the use of ESR as a monitor for these oxidations.

These specialist articles will appeal most to individual research workers, but some of the chapters do not carry complete references in the specific fields. The book is well produced. The structural formulae in the chapters should be standardised. This book should find a place in most libraries. However, the price for value is rather high for the individual.

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Pharmacognosy, 10th Edn: by G. E. TREASE and W. C. EVANS, Bailliere Tindall, London, 1972. 795 pp. £6.80.

WHAT CAN one say of the tenth edition of any popular treatise? Obviously the call for a new edition after a lapse of only six years means that this textbook well serves its purpose and must be recommended by many teachers in pharmacognosy. A glance through the present edition, or indeed the previous one, soon indicates why. The authors have set out to expand Professor Trease's original work to give due emphasis to the modern developments in phytochemical techniques and associated subjects which have made pharmacognosy one of the most catholic of all scientific disciplines. Are all these subjects treated adequately within the compass of an 800 page book? I think the answer is a qualified yes. Qualified, because I believe that the one section which is of direct interest to readers of *Phytochemistry*, that on phytochemistry, is out-of-date both in treatment and coverage. This starts in the very first chapter of the section where the 'types of plant constituent' are listed. This looks like something out of a pre-1930 organic text book, and is often misleading or untrue. For

example, limonene and lycopene are placed under compounds containing carbon, hydrogen and oxygen; under esters are grouped methyl salicylate, glycerides, ester alkaloids and pyrethrins; usnic acid and ascorbic acid are linked as furan-containing compounds. The same problems occur here and there in the chapters that follow. Benzoic and cinnamic acids are described as the 'best known aromatic acids', rather than their hydroxy derivatives. Glycosides are the usual rag-bag of everything from saponins to nucleic acids and so on. All this is a pity, because the section which follows on biosynthesis classifies all these compounds in a perfectly acceptable way. It is to be hoped that in the next edition the authors will put this section first and organise the descriptive catalogue of plant products according to its arrangement. The second section on 'Plants and Their Structure' is adequate, but could be improved I feel, by the inclusion of some modern microphotographs, especially of EM or scanning EM in many of the chapters. (One notes, for example, the new Figure 26 on plant tissue culture which beautifully illustrates the accompanying text.) The new section of 'Genetics and Comparative Phytochemistry' is a perfectly adequate introduction to these areas and the next on 'From Plant to Crude Drug' has been considerably re-organised for the better, although a few up-to-date photographs of drug cultivation would be in order. The final three sections on 'Drugs of Botanical Origin', 'Drugs of Animal Origin' and 'Microscopical Techniques and Commercial Fibres' have retained the traditional pharmacognosist's layout: the source, cultivation, character, constituents, tests and uses for each product being described in full, the plant sources being arranged in order of Engler's *syllabus*. Here and there, new data have been added (especially chemical tests, formulae) and old material eliminated. Probably more could be, especially some of the older relatively uninformative photographs such as those of packaged Indian opium or cascara in store. The book ends with a valuable Appendix containing selected Phytochemical Abstracts from 1966 to 1970. All in all, I believe the book is extremely valuable. I hope some of the suggestions made in this review can be used by the authors when the next edition is called for, as it undoubtedly will be.

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