Plants and Mineral Salts: by J. F. SUTCLIFFE and D. A. BARKER. Edward Arnold, London, 1974. 60 pp. £1.70 (paperback 85p).

This volume is No. 48 in the Institute of Biology's introductory texts for students in biology, a series which is aimed mainly at students and teachers in biology at school and in the first year of university. It was started some 7 years ago and some of the earlier volumes have been very successful; that on plant taxonomy by V. H. Heywood for example, has sold over 20000 copies and, in addition, has been translated into five languages. The present account of plant and mineral salt relationships deserves equal success since it has an excellent text covering an important, often neglected topic, which is amply illustrated with fine photographs and clear figures.

The book consists of five chapters which deal in turn with salt supply, salt requirements, ion absorption, ion uptake and ion transport. In a subject which is often controversial, it is refreshing to find authors who are willing to discuss rival theories impartially. One salient feature which emerges from this short book is that we are still considerably ignorant of many of the finer details of mineral nutrition and ion transport. Hopefully it will stimulate interest in a field which is of fundamental importance in both plant physiology and plant biochemistry.

University of Reading J. B. HARBORNE

Progress in the Chemistry of Organic Natural Products, Volume 31: edited by W. HERZ, H. GRISEBACH and G. W. KIRBY. Springer-Verlag, Vienna, 1974. 693 pp. DM 231 or £41.

The present volume in this excellent series contains ten chapters in which fifteen experts review a range of currently important topics in natural product chemistry. The chapter which will perhaps command the widest audience is the one by G. A. Swan on the melanins, their structure, chemistry and biosynthesis. This is a well-documented up-to-date account of these polymeric, mainly black, pigments which are widely and diversely distributed throughout living organisms. Three groups are now recognized: the catechol-based allomelanins of plants, the nitrogen-containing eumelanins of the animal kingdom, and the N- and S-containing phaeomelanins, hair pigments in animals and humans. The practical problems in purifying and characterizing melanins are still very considerable; as the author points out, there is no means of proving that two melanins are identical and classification is still perforce based on comparisons of products of oxidative degradations. Considerable practical problems of separation and purification also had to be overcome before the cocarcinogens present in croton oil could be identified. As E. Hecker and R. Schmidt describe in their masterly chapter on this topic, this is one of the few areas where countercurrent distribution methods have been of invaluable assistance. Chemical study of these tetracyclic diterpenes esterified with fatty acids was held up by their instability but, once the compounds were obtained pure, they soon yielded up the secrets of their structures, following the application of spectral measurements and determination of their chemical reactions.

No less than three chapters in this volume are devoted to fungal products of pharmaceutical importance. Thus there is a 50-page review of recent developments in the chemistry of the penicillins by D. N. McGregor. This covers the period 1964–1972 and deals partly with the products obtained by modifying the sidechain at the 6-position in the penicillanic acid nucleus but mainly with those in which the chemistry of the penicillanic acid moiety itself has been altered. The second fungal chapter by Ch. Tamm of the university of Basle describes the chemistry and biosynthesis of the antibiotic verrucarins and roridins, products of the soil fungus *Myrothecium*. The third chapter by J. C. Roberts reports on the well known carcinogenic mycotoxins derived from *Aspergillus*, the aflatoxins and the sterigmatocystins. This is a useful, necessarily brief, account of their structural elucidation, synthesis and biogenesis.

Two of the remaining five chapters describe higher plant constituents. One by H. Wagner outlines the glycosidic complexity of the flavonoid pigments and includes methods of their laboratory synthesis, an area of research where the author in collaboration with L. Farkas has made considerable progress in recent years. The other

is devoted to the bicyclic spiro [4·5] decane sesquiterpenes, the best known members of which are acorone from *Acorus calamus* and β-vetivone from *Vetiveria zizanoides*. A useful tabulation of the physical properties and sources of the 37 sesquiterpenes of this type is included in this chapter. The last three chapters cover biogenetic-type syntheses of polyketides (T. M. and C. M. Harris, K. B. Hindley), the stereoselective total synthesis of indole alkaloids (E. Winterfeldt) and the mechanisms of corrin-dependent enzymic reactions (G. N. Schrauzer).

University of Reading J. B. HARBORNE

Drugs and Transport Processes; edited by B. A. CALLINGHAM. MacMillan, London and Basingstoke. 376 pp. £13.00.

This is not a book that I would recommend Plant Biologists should buy, but if they are interested in membrane processes, it is one they should note. It reports a meeting organized by the Biological Council Coordinating Committee for Symposia on Drugs Action and held on two days in April 1973. Some articles are of little interest to plant physiologists, but, if they are interested in membrane processes, they will find a number of articles which are well worth reading. Clearly these articles do not directly relate to plant systems, but they provide pointers as to the way plant physiologists may have to turn their thinking and experimental attack. I should like to instance two: one by G. Semenza on the transport of sucrose in the small intestine. This is a fascinating article because it indicates a possible mechanism for sucrose uptake in plant cells and at the same time describes an elegant attack on the problem under investigation both using the intact tissue and black lipid membranes. The other article by W. F. Widdas summarizes in a succinct manner our knowledge of the hexose transport system in erythrocytes and this article should appeal to anybody who is interested how proteins in membranes bring about transport. But in a general way the book is valuable because it indicates how plant physiologists might proceed in what looks like proving to be a developing field of the subject. Drug action in animals is paralleled by phytotoxin action in higher plants and it is interesting to note that Gardner, Scheffer and Higinbotham have reported (*Plant Physiol.* **54**, 246–249, 1974) that the H. V. toxin from *Helminthosporium victoriae* affects the passive permeability to ions of infected plants. H. V. toxin is clearly a compound which can provide valuable information about the functioning of plant membranes and experiments using this toxin could clearly parallel the sorts of experiments used by pharmacologists and animal physiologists.

The book is well written and well illustrated. Discussions at the meeting are recorded but as seems to be customary, they don't appear to be very useful. The book seems to be excessively expensive at £13.00.

University of Liverpool D. H. JENNINGS

Enzyme Handbook, supplement 1: by THOMAS E. BORMAN. Springer-Verlag, Berlin, 1974. 517 pp. DM 51.80. £9·10.

This first supplement to the Enzyme Handbook published in 1969 (for review, see *Phytochemistry* **10**, 619) mainly covers enzymes discovered in the intervening 5 years and lists concise molecular and catalytic data for no less than 430 new proteins. Enzymes are arranged, as in the original Handbook, according to their E.C. numbers and for those interested in statistics, it may be noted that oxidoreductases occupy 151, transferases 123, hydrolases 98, lyases 68, isomerases 27 and synthetases 15 pages respectively. The phytochemical reader will discover than an increasing number of enzymes of secondary metabolism from higher plant sources appear in this Supplement. For all those who have found the original two-volume handbook indispensable in the laboratory, this Supplement will be an essential buy.

University of Reading J. B. HARBORNE

Plant Anatomy by A. FAHN. Second edition, revised. Pergamon Press, Oxford, 1974. pp. i–viii + 611 with 257 text figures. £9.60 & £5.10 (flexi cover).

The first edition of Fahn's *Plant Anatomy* was well received and is widely used by botany, horti-