

## BOOK REVIEWS

**Chemical and Botanical Guide to Lichen Products:** CHICITA F. CULBERSON. University of North Carolina Press, Chapel Hill, 1969. 628 pp. Price \$12.50.

IN THESE days when abstracting and review services generally fail to keep abreast of the vast flow of new phytochemical discoveries reported in this and related journals, any up-to-date and comprehensive compilation of natural products is bound to be assured of a warm welcome. The present work, which thoroughly documents all the lichen products known up to mid-1968, is especially valuable since it is so authoritative and covers a series of molecules of outstanding biosynthetic and chemotaxonomic interest.

The lichens, perhaps because of their conspicuous colours, have received more attention from chemists than many other lower plant groups, such as the mosses, and this is brought out in the fact that some 300 compounds, most of them occurring uniquely in the lichens, are included in this guide. The substances are first listed with their physical data, chemical structures and annotated references and then according to their distribution in some 2000 lichen species and varieties. This figure refers to only a ninth of the known species, so it is clear that many more new compounds remain to be discovered. These lists are preceded by a very useful introductory chapter, mainly devoted to the biogenesis of the lichen substances. My only disappointment with the book is that the author has not discussed the chemotaxonomy of the lichens in any detail. It is true that this has been done elsewhere (e.g. by M. E. Hale in *The Biology of Lichens*, Edward Arnold, 1967), but since the author and her husband have contributed so much to this aspect of lichenology, it would have been appropriate to include a section on this topic.

For such a useful dictionary, the book is remarkably low priced, which will no doubt commend it to both research workers and librarians contemplating its purchase.

*University of Reading*

JEFFREY B. HARBORNE

**Der Sekundärstoffwechsel in Pflanze und Tier:** M. LUCKNER. VEB Gustav Fischer-Verlag, Jena, 1969. 360 pp. Price 49.50 Marks.

THIS EXCELLENT book is written for the non-specialist. It reviews the biogenetic pathways leading to the many kinds of so-called secondary metabolites. The matter is arranged according to the starting points of the respective pathways. By this scheme, sugar-derived, tri-carboxylic acid-derived, acetate-derived, isopentenyl pyrophosphate-derived, shikimic acid-derived and amino acid- (subdivided in 15 chapters) derived constituents are each treated as separate groups. Most of the known classes of secondary metabolites of plants and animals find an appropriate place in the scheme followed by the author. Some omissions, easy to restore in a second edition, concern the botanically very important class of tannins (e.g. ellagitannins, bergenin, condensed tannins) and the xanthones of the Guttiferae and the Gentianaceae. The arrangement chosen necessarily implies that structural types elaborated along several pathways in different plant groups (e.g. quinoline alkaloids, anthraquinones,

salicylic acid) have to be dealt with more than once. This approach, however, seems to be an excellent one. It demonstrates clearly many types of biosynthetic analogies and homologies and stimulates a critical evaluation of metabolites, which is essential in comparative biochemistry. A valuable feature of the book is the author's endeavour to terminate each chapter and subchapter with a list of carefully chosen references (generally, recent review articles). In an introductory chapter the general nature of secondary metabolites, their ecological significance and the intracellular localization and regulation of biogenetic pathways are briefly discussed. Some of the statements made in the very short ecological chapter will probably be rejected by most scientists interested in evolution and in ecological chemistry. It was, however, not the intention of the author to give an adequate treatment of this still highly controversial field of research. The book ends with a carefully compiled index, which makes it easy to find metabolites and metabolic pathways. An index of organisms responsible for the production of the compounds discussed, however, is lacking. This is another "desideratum" of the reviewer for a second edition of this useful and handsome book.

*University of Leiden  
Germany*

R. HEGNAUER