

law is derived and Boltzmann's  $H$ -theorem is proved. The discussion of the latter topic is much more detailed and precise than is usually given.

Part 2, on the quantal statistical mechanics, is the most important part of the book. It is, however, marred, in the reviewer's opinion, by the inclusion of an exposition of quantum mechanics occupying about 150 pages. Most of this is quite irrelevant, breaks the continuity of the book and expands it into a volume which is too bulky. There would perhaps have been a good deal to say for the inclusion of some general theory starting from a fairly advanced point, since some of the results required are not readily available in a convenient form, but discussions of such topics as one-dimensional collisions and the hydrogen atom are quite out of place. The writer of a book such as this must assume that his readers are well versed in the elements of quantum mechanics and, in all

probability, in the more advanced theory also. If they are not, they will find the going rather heavy. As in Part 1, the main objects are the derivation of the distribution functions and the proof of the  $H$ -theorem. Part 3 deals with the relation of statistical mechanics and thermodynamics.

The book has been most carefully and, for the most part, well written, but the reviewer found himself sometimes fogged by the wealth of explanation. In dealing with a difficult subject, it is by no means easy to know how much explanation to give, since over-exposition is almost as bad as under-exposition, but the book would probably be improved by being shortened. It is, however, a valuable addition to the literature, and will be indispensable to those who wish to understand the principles of statistical mechanics, especially of quantal statistical mechanics.

A. H. W.

## GROWING-POINTS OF ORGANIC CHEMISTRY

The Chemistry of the Carbon Compounds  
By Victor von Richter. Edited by the late Prof. Richard Anschütz. Vol. 2: The Alicyclic Compounds and Natural Products. Translated from the twelfth German edition (compiled by Prof. A. Butenandt, Dr. M. Lipp, Dr. K. Niederländer, Prof. F. Reindel and Dr. F. Rochussen) and revised by T. W. J. Taylor and Dr. A. F. Millidge. Third edition. Pp. xiii+656. (Amsterdam: N.V. Uitgevers-Maatschappij "Elsevier", 1939.) n.p.

IN his introduction, Mr. Taylor explains that this book is a translation and revision of the first part of volume 2 of the twelfth edition of Richter-Anschütz's "Chemieder Kohlenstoffverbindungen", the German original of which appeared in 1935. The closely related fields of work here selected for treatment are of the first importance in modern organic chemistry. Section A, comprising about 350 pages, deals with alicyclic compounds, and discusses in the first instance such fundamental matters as the formation and stability of ring structures, ring transitions, and general methods of preparing alicyclic compounds. The detailed consideration of monocyclic compounds is then taken up, ranging systematically from the *cyclo*-propane group to compounds containing 34 carbon atoms in the ring. The succeeding description of polynuclear alicyclic compounds embraces rings directly united and those separated by a chain, spirane structures, condensed cyclic systems, and bridged rings. Terpenes and resins are then treated under the headings of olefinic terpenes,

monocyclic terpenes, bicyclic terpenes, and sesquiterpenes and polyterpenes.

Section B, comprising the rest of the book, is devoted to the successive consideration of various classes of important naturally occurring compounds, including glycosides, tannins, lichen acids, the active principles of the peppers, natural colouring matters, nitrogen-free poisons, sterols, bile acids and scymnol, vitamins, and hormones.

In the preparation of this valuable edition the original authors revised their contributions to the German edition, and the English translation was subjected to a final revision by Mr. Taylor and Dr. Millidge, with assistance from Prof. A. R. Todd, Dr. S. G. P. Plant, and others. The result is a reliable and surprisingly detailed and up-to-date account of a vast and ever-growing region of organic chemistry. So far as the reviewer has put the text to the proof, the important advances of the last few years in these many fruitful fields of endeavour find here an admirable presentation. As a compact and yet comprehensive work of reference the volume will be of outstanding value to specialists and research workers in the many subjects of which it treats. The continued references to the *Zentralblatt* which formed a somewhat irritating feature of earlier editions of Richter-Anschütz have been happily replaced by direct references to the original papers, including the names of the authors. The text and formulæ are well printed, and there is a good subject index of fifty pages.

JOHN READ.