

BOOK REVIEWS

The Encyclopedia of Chemistry. Edited by GEORGE L. CLARK, GESSNER G. HAWLEY, and WILLIAM A. HAMOR, Reinhold Publishing Corporation, New York 1957. xvi + 1037 pp., \$19.50, £7. 16s.

THIS large volume contains somewhat over eight hundred short articles contributed by more than five hundred chemists and allied scientists. Some of these men are particularly distinguished in the fields about which they write: for example E. W. R. Steacie on Free Radicals, C. P. Smyth on Dipole Moments, H. Eyring on Reaction Rates, J. E. Hildebrand on Solubility, and G. T. Seaborg on Transuranium Elements to mention just a few at random. The articles vary from a short paragraph to three or four two-columned pages; they all have cross-references but unfortunately no bibliography. Although some of the articles are of the very highest quality the standard is very uneven and there are some quite extraordinary overlaps and omissions. Alkaloids are dismissed in a page and a half of muddled writing containing some factual errors, while glycols are spread over two and a half pages. Over a page is devoted to quinoline, while iso-quinoline is not mentioned and pyridine receives a few lines in the article on Heterocyclic Compounds the total length of which is three-quarters of a page. A curious overlap occurs in the articles on Hydrolysis and Saponification. The different contributors have chosen the same reaction (the hydrolysis of tri-stearin) as their example yet, in spite of copious cross-references, neither article refers to the other. On the whole Organic Chemistry is particularly unevenly treated, although there are some bad articles and odd omissions in other fields. The essay on Acids, apart from being most inexact, fails to mention Brönsted, Lowry, or Lewis, or the concepts connected with their names. Only some of the elements are listed (surely it would be better to include them all, even if many could be discussed in two lines?), and the selection is strange, for example Francium is included while Argon is not. A desirable feature is the inclusion of brief biographies of famous chemists such as Dalton, Berzelius, and Willstätter, also included are E. G. Acheson, H. H. Dow, and E. W. Hilgard, while J. L. Gay-Lussac, Emil Fisher, and G. N. Lewis are not! It would be possible to enumerate many more minor errors and strange omissions but sufficient has been said to indicate the main weaknesses of the book. A larger editorial board including chemists from all the major branches of chemistry would seem essential to obtain anything like an even coverage of the vast field attempted. Although as a complete unit the book must be regarded as a failure, it does contain some excellent essays, (e.g. Chemical Literature by E. J. Crane) and some masterly condensations of complex subjects (e.g. Carbohydrates by Whistler and Corbett). The printing is excellent, there are very few typographical errors, and the paper and binding are good.

J. M. TEDDER

E. CARTMELL and G. W. A. FOWLES: **Valency and Molecular Structure.** Butterworths Scientific Publications, London, 1956. 256 pp., 32s. 6d.

As the authors state in their preface "This book is written by chemists for chemists," and a study of the book leaves no doubt that the authors have produced a most useful text. The subject matter is divided into three parts. Part I on Quantum Theory and Atomic Structure discusses the experimental foundations of the Quantum Theory and its application to isolated atoms. The application of the theory to atoms in combination is described in Part II on the Quantum Theory of Valency; the approximation methods of valency bond and molecular orbital methods are discussed, and both are used in the discussion on directed valency. Part III describing the Application of the Principles of Chemical Bonding constitutes almost half the text, and contains Chapters on recent work concerning bonding in the solid state, the structures of some simple inorganic compounds, complex compounds, and electron-deficient molecules.

The authors have certainly justified their prefatory remark—the honours student in chemistry will find the text of considerable assistance and the postgraduate will find the discussions of recent work in Part III stimulating.

The Authors and Publishers are to be congratulated on the production of a most interesting text which should appeal to a wide circle of chemists. The subject matter is well illustrated with tables and diagrams.

H. STEPHEN

LOUISE KELLEY: *Organic Chemistry* (2nd Ed.). McGraw-Hill, New York, London, 1957. viii + 757 pp., 56s. 6d.

THIS volume by Louise Kelley is a revision of *Organic Chemistry* published by this author in collaboration with Albert Hill in 1943. The aim of the author, stated in the preface, is to present a textbook suitable for a first year course and comprehensive enough to serve later as a reference book for the student. This aim has been achieved in that the first year course is more than adequately covered and the inclusion of chapters on Polynuclear hydrocarbons, Dyes, Terpenes, Heterocyclic compounds; Alkaloids; Steroids, Plant pigments, and Vitamins should prove useful to the better student.

The Introduction is followed by a chapter on bond structure which as well as dealing with electronic structure, types of bonds, bond angles, and electronic displacement, has some excellent explanatory tables from the works of Ingold, Pauling and Ferguson. Reaction mechanisms are not introduced until Chapter 12 by which time the student has become familiar with organic chemistry, having studied aliphatic hydrocarbons (including rubber) alcohols, ethers, acids, and esters. Chapter 13 deals with Molecular Orbital Theory, again a good stage at which to introduce these ideas to the new student.

The section on Stereochemistry is weak. Absolute configuration is not mentioned and we are told that "there is no way of determining the spatial configuration which is responsible for a dextro-rotatory or levorotatory effect". One feels that even in textbooks for first year students it should be clear that, as shown by Bijvoet and his co-workers, the arbitrary configuration assigned to D(+)-glyceraldehyde represents the absolute configuration of the molecule. Again diagrams in this chapter are not good, which is surprising as those in the rest of the book are excellent.

The aromatic portion of the text is, as is usual, introduced by a chapter on Benzene and its Homologs and here, as on the aliphatic side, there is a modern approach. The following section headings may best illustrate the manner in which the electronic effects are discussed—orientation and activation in the benzene ring; explanation of orienting and activating effects in aromatic substitution; effects of *ortho*- and *para*-directing groups.

About 80 pages have been allocated to more advanced topics. Under Dyes are discussed the modern theory of colour and the dyeing of such fibres as cellulose acetate, nylon, Orlon, and Dacron. Under Heterocyclic Compounds are descriptions of sulpha drugs, a note on penicillin, and the formulae for aureomycin and terramycin.

To be commended is the attention to detail in the following—the numbering of sections in each chapter, making for easy cross-reference; the short biographical notes throughout the text; a good variety of problems, suggested reading, and references to recent literature at the end of the various chapters.

On the whole, in the opinion of the reviewer, a competent work in which the author has achieved her aims.

EVA M. PHILBIN

- G. ENGELSMA and E. HAVINGA: Oxidations with copper-amine complexes—VI. Oxidation of aromatic amines and of aniline in particular
- J. T. EDWARDS: Stereochemical control of some reactions of strychnine
- R. ANEJA, S. K. MUKERJEE and T. R. SESHADRI: Synthesis of benzo-furans—I. Karanj ketone, karanjin and pongapin
- A. F. VOMPE, N. V. MONITCH, N. F. TURITSYNA and L. V. IVANOVA: New conversions of pyridinium salts and syntheses of γ -amino-substituted pyridines
- GEORGE S. HANDLER and JOHN H. ANDERSON: Elementary molecular orbital treatment of *cyclo*-propane and *cyclobutane*
- ROLF HUISGEN and ULRICH RIETZ: Mittlere Ringe XIII. Die intramolekulare Acylierung der *w*-(1-Naphthyl)-fettsäuren
- J. C. TATLOW, D. E. M. EVANS, J. A. GODSELL, R. STEPHENS and E. H. WISEMAN: Fluorocyclohexanes—II. *cis*- and *trans*- 1H:3H and 1H:4H-decafluorocyclohexanes
- D. H. WHIFFEN and D. STEELE: Carbon-hydrogen stretching vibrations in fluorocyclohexanes
- J. C. TATLOW, J. A. GODSELL and M. STACEY: Fluorocyclohexanes—III. 1H:4H/2H- and 1H/2H:4H-nonafluorocyclohexane and derived compounds
- MAURICE M. KREEVOY: Resonance energies of two unusually stable hydrocarbon free radicals
- GUNTHER S. FONKEN and JOHN A. HOGG: 11-alkylated steroids—I. The synthesis of 11-methylhydrocortisone acetate
- B. C. JHA and G. C. AMIN: Studies in halo-chalcones and related compounds. Synthesis of 3':5'-dichloro-2'-hydroxychalcones and their derivatives
- R. B. BRADBURY: The structures of jaconecic and *isojaconecic* acids
- E. CLAR, W. KEMP and D. G. STEWART: The significance of KeKulé structures for the stability of aromatic systems

ERRATUM

H. C. Brown, O. H. Wheeler and K. Ichikawa,
Tetrahedron 3, 214 (1957).

Figure 2 on p. 220 has been transposed with Fig. 3
on p. 216.