

have had considerable experience with the organic syntheses surveyed and have given a thorough compilation on the scope and limitations of seven organic reactions. This volume should enjoy a reputation as an indispensable source of knowledge on the chemistry of the Pechmann reaction, the Skraup synthesis, carbon-carbon alkylations with amines and ammonium salts, the von Braun cyanogen bromide reaction, the hydrogenolysis of benzyl groups attached to oxygen, nitrogen or sulfur, the nitrosation of aliphatic carbon atoms and the epoxidation and hydroxylation of ethylenic compounds with organic peracids.

It is pleasing to note that two of the most important methods for ring closures involving the condensation of carbonyl groups with aromatic nuclei—namely, the Pechmann reaction for the making of coumarins and the Skraup synthesis of quinolines—are discussed in the same volume. Lignin chemists, mindful of the increasing importance of the benzyl ether linkage in this natural polymer, will welcome the chapter on the hydrogenolysis of benzyl derivatives. The chapter on the cyanogen bromide reaction will give chemists ample opportunity to explore the synthetic possibilities of this reaction which hitherto has been used mostly for degradation studies.

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Condensed Pyridazine and Pyrazine Rings (Cinnolines, Phthalazines, and Quinoxalines). By J. C. E. SIMPSON, Late Number of Scientific Staff, Medical Research Council, England. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1953. xvi + 394 pp. 16 × 23.5 cm. Price, \$12.50—Subscription Price, \$11.25.

This beautifully printed and easily readable book represents a great amount of painstaking literature study and analysis, and it is a valuable addition to the monograph series on heterocyclic systems. One is impressed by the compactness and meticulous care with which the material has been organized. It is unfortunate that the author, who carried the work into the type-setting stage, did not live to see the finished product.

The literature is covered through 1948 and the references are carried through 1949. Much of the literature on the cinnolines and phthalazines is relatively recent and the accounts are "intended to be exhaustive." On the other hand, the quinoxaline chapters are more broadly based on the body of earlier literature reviewed in Meyer-Jacobsen's "Lehrbuch," with incidental referencing of the literature prior to 1917.

One feature of the book which facilitates study is the systematic organization into small chapters covering the several major types of derivatives, each in individually complete form, with separate bibliographies and with separate numbering systems for the formulas. Considerable attention is given to concise but thorough discussions of experimental methods employed, which makes the book particularly informative and valuable to readers who are experimentalists. The discussions of the several chapters are systematically broken down into syntheses and properties, and tables of compounds and derivatives are frequently employed.

Those particularly interested in mechanism and structural theory may be disappointed in the limited scope and prominence of discussions along these lines. The author has evidently taken it for granted that the reader is conversant with modern theory of quinoline and isoquinoline chemistry. Actually, adequate and critical consideration is given to the theoretical aspects of problems in the several fields covered, wherever pertinent and significant work has been done. This reviewer is particularly pleased, for example, with the brief yet adequate discussions of the mechanism of the cyclization reactions and the influence of substituents.

A casual reader who wishes to understand the behavior of the ring systems covered, must refer to discussions of properties which are scattered throughout the book and which appear in the several chapters. It is perhaps un-

fortunate that more comprehensive and critical discussions are not offered, but the nature of the subject obviously makes such a treatment difficult and perhaps impractical.

Altogether it may be said that this book is concise, it is adequate for the specialist, and it is of real value and interest to the more casual reader by virtue of its excellent organization and readability.

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