

NEW BOOKS.

Organic Chemistry for Advanced Students. By JULIUS B. COHEN, PH.D., B.Sc., Professor of Organic Chemistry in the University of Leeds. New York: Longmans, Green & Co. 1907. pp. viii + 632. Price, \$7.00.

The purpose of this book is to supplement the ordinary text-books of organic chemistry by giving more extended surveys of selected topics of special interest. This is, of course, not a new or unoccupied field, for in this country we have Lachman's "Spirit of Organic Chemistry," and in Germany Ahrens's "Vorträge." The new book covers much more ground than the former, but is not so comprehensive in scope as the latter. It is a publication of the subject-matter of lectures which the author has been delivering to his senior students at the University of Leeds, and its field will appear from a glance at the Table of Contents. The chapters are as follows: Historical Introduction, Isomerism and Stereoisomerism, Stereochemistry of Unsaturated and Cyclic Compounds, Stereochemistry of Nitrogen, Isomeric Change, Steric Hindrance, Condensation, Carbohydrates, Fermentation and Enzyme Action, Purine Group, Proteins, Benzene Theory, Terpenes and Camphors, and Alkaloids. A select bibliography at the close of each chapter lists the more important works on the subject, in addition to which there are full references throughout the text.

The material has been chosen with care and discrimination and is presented clearly and concisely. The publishers' work is well done, type and paper being very satisfactory.

The book is a very useful contribution to the literature of the subject, and should be warmly welcomed by all advanced students and teachers of organic chemistry, for it gives in compact form a conspectus of recent progress along lines of particular interest. Thus, the chemist who has had but little time to keep up with recent investigations in such matters as the stereochemistry of the sugars, the synthesis of terpenes, of alkaloids, of polypeptides, enzyme action, tautomerism, and the like, will find here the desired information.

The reviewer most heartily commends the work to the attention of all interested in organic chemistry.

MARSTON TAYLOR BOGERT.

Kurzes Lehrbuch der Organischen Chemie. Von WILLIAM A. NOYES, Professor der Chemie an der Universität Illinois. Mit Genehmigung des Verfassers ins Deutsche Uebersetzen von WALTER OSTWALD, und mit einer Vorrede von PROFESSOR WILHELM OSTWALD. Leipzig: Akademische Verlagsgesellschaft, m. b. H. 1907. 8°, xxiv + 722. Price, bound, 10.80 Marks.

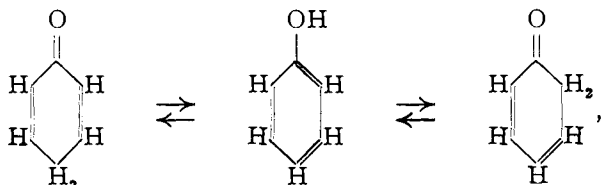
"The justification for adding another volume to the long list of German text-books on organic chemistry, and *that* a translation, must be found in the independent treatment and originality, with which the author conceived and carried out his work. In view of the enormous mass of facts of organic chemistry, it is of decisive importance for every

beginner that he should master as soon and as thoroughly as possible the fundamental points of view connecting these facts systematically. By the original arrangement of its material, the mass of facts has been treated systematically in so logical a way, that the student of this small volume will be able to continue his studies without any fear of losing his way in the thickets of organic chemistry. The author has also solved the difficult problem of suggesting to the student the more advanced fields to be conquered without discouraging him from attempting them. This result has been attained by the great clearness of the style of presenting the subject....."

This free translation of a part of Professor Ostwald's introductory statement to the translation of Noyes's "Organic Chemistry" explains sufficiently the signal honor that this book has received of being rendered into German with the approval of the master mind, in Germany, of the science of the teaching of chemistry.

The writer of this review would recall the fact that the most conspicuous feature in the presentation of material in Noyes's book lies in the fact that the aromatic series of compounds is treated systematically with the aliphatic series. In the first descriptive chapters, all the different classes of hydrocarbons, including benzene and related compounds, are first considered. This arrangement makes it possible to present logically and without unnecessary duplication the reactions of closely related groups of compounds of the aliphatic and the aromatic series, such as the alcohols and the phenols, the amines and the anilines, and so forth. It also makes it possible to discuss at an early stage some of the numerous reactions leading from compounds of one series to those of the other series.

The more critical study of the compounds of the two series is obliterating more and more the lines of any fundamental differences between the two and is recognizing, instead, differentiation in reactivity of groups of compounds of analogous structure common to both series; for instance, it may be recalled that acetacetic ester unquestionably shows the behavior of a phenol, both in its tendency to form salts and in the reactivity of its methine group ($:\text{CH}-$, in the enol form) towards halogens, nitrous acid, diazobenzene, etc. A striking similarity in constitution is obvious if we accept Kekulé's structure for benzene. *Vice versa*, this parallel suggests that even monophenols form tautomeric compounds,



the latter derivatives of a dihydrobenzene, which would account in the simplest way for the comparative ease with which phenol rings are oxidized and opened. It is well-known that the analogy in the behavior of 1,3-dihydroxy- and 1,3,5-trihydroxybenzenes and that of 1,3-dicarbonyl derivatives is even more striking.

The puzzling and central fact that benzene and its derivatives appear to be more stable in the unsaturated condition (Kekulé's formula) and react in most cases as saturated compounds (in the ring) is also not without parallel in the aliphatic series; for instance, the organic acids certainly resist reduction in the unsaturated carbonyl group almost as vigorously as do certain benzene compounds; even when their carbonyl group absorbs certain reagents, yielding temporarily ortho derivatives, there is a rapid reversion to the more stable unsaturated carbonyl group—in the acid esters, amides, etc.). At the same time this same unsaturated carbonyl group has an unmistakable effect on the activity of the hydrogen of the immediately neighboring groups, *e. g.*, such groups as CH and OH—much as the activity of the hydrogen atoms adjacent to the unsaturated groups of the benzene nucleus is enhanced, and when we have two such neighboring unsaturated groups in aliphatic compounds, *e. g.*, in the 1,3-dicarbonyl series, the analogy is even more marked. Again, we have all degrees of gradation in such relations—the carbonyl group in aldehydes is readily reduced by hydrogen, but towards very many other reagents shows again the same tendency to reversion to the unsaturated condition as a stable form. Benzene derivatives are likewise not all equally resistant to reduction and saturation, as shown by Baeyer, Bamberger and others for the phthalic acids, the naphthalenes and similar compounds. Stability in the so-called unsaturated condition may therefore well be simply a question of peculiarities of structure and energy content, common to all fields of chemistry. It may not be amiss to recall parallel cases of the resistance to saturation of unsaturated compounds in inorganic chemistry, as shown by the phosphines and arsines at ordinary temperatures, and by ammonia above 400°.

The arrangement used by Noyes, treating the aromatic compounds with the aliphatic ones, appears to the writer therefore logical, both pedagogically and scientifically; exhaustive studies of the relation between the two series and especially of the question of stability and reactivity of unsaturated molecules, as made in the investigations of Baeyer, Nef and Thiele, may solve that perplexing problem of the structure of benzene in the simplest of all ways, by demonstrating that there is no real benzene problem, but a broader, greater problem of equilibrium conditions of unsaturated valences.

J. STEGLITZ.

Exercises in Elementary Quantitative Analysis for Students of Agriculture.

By AZARIAH THOMAS LINCOLN, PH.D., and JAMES HENRI WALTON, JR.,