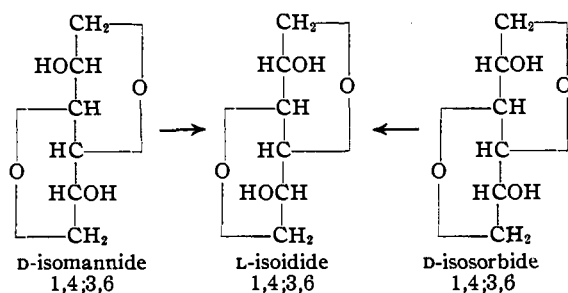


TABLE II
DIANHYDROHEXITOLS AND THEIR DERIVATIVES

	1,4;3,6-Dianhydro- D-sorbitol (D-isosorbide)	1,4;3,6-Dianhydro- D-mannitol (D-isomannide)	1,4;3,6-Dianhydro- L-iditol (L-isoidide)
M. p., °C.	61.9-64.0	86.7-89.5	63.7-64.5
Specific rotation (H ₂ O)	44.8 (c, 2.22; 24.4°)	20.8 (c, 2.02; 24.5°)
Specific rotation (CHCl ₃)	32.8 (c, 2.47; 26.2°)	62.2 (c, 1.88; 26.2°) ^a
Specific rotation (C ₆ H ₆ N)	64.9 (c, 2.32; 28.2°)	139.4 (c, 2.22; 28.2°)	33.27 (c, 2.24; 28.2°)
M. p. of dibenzoate	101.5-102.2	132.0-132.4	111.0-111.3
Specific rotation of dibenzoate (CHCl ₃)	23.1 (c, 1.14; 25.0°)	225.7 (c, 1.34; 20°)	141.9 (c, 2.15; 25.2°)
Specific rotation of dibenzoate (C ₆ H ₆ N)	13.78 (c, 2.39; 28.2°)	235.9 (c, 2.12; 28.2°)	110.5 (c, 2.07; 28.2°)

^a The compound proved too insoluble in chloroform to obtain an accurate rotation.



isomannide has the 1,4;3,6 configuration, the structures of D-isomannide, D-isosorbide, and the new L-iditol dianhydride (for which the trivial name L-isoidide is proposed) are now considered as established.

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 WILMINGTON 99, DELAWARE R. MAX GOEPP, JR.
 RECEIVED MAY 17, 1945

NEW BOOKS

The Theory of Resonance and its Application to Organic Chemistry. By GEORGE WILLARD WHELAND, Assistant Professor of Chemistry, University of Chicago. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1944. vi + 316 pp. Illustrated. 14.5 × 21.5 cm. Price \$4.50.

It has frequently been said in recent years that the concept of resonance and its concomitant functions has been the most important contribution to structural organic chemistry since the formulation of the electron pair bond by G. N. Lewis. This statement is again made in the preface to the present work by one who has had a considerable part in making it so. But, as with all basically new conceptions, attempts have been made to apply it to cases in which it is not applicable and to draw from it conclusions which it does not truly contain. The source of these misconceptions lies mainly in the mechanical analogies which have been used in the exposition of an idea that really has no complete counterpart in classical mechanics. These analogies must in the nature of things be limited and the lack of appreciation of the limitations of these analogies has led to a certain amount of futile effort to demonstrate them experimentally, and to much non-pertinent controversy both oral and written.

In this, the first book devoted entirely to an exposition of resonance and its applications in organic chemistry, the attempt is made to resolve some of the difficulties. So, in the author's own words: "A comprehensive discussion

of resonance offers difficulties. On the one hand, this theory has been found to have its most interesting applications, and to be of greatest value, in the field of organic chemistry. For that reason, it should preferably be presented in terms with which the organic chemists are familiar. On the other hand, its basis lies in the mathematical depths of quantum mechanics. For that reason, it can be presented precisely and completely only in highly mathematical language. Some sort of working compromise must therefore be reached."—And he has achieved a good measure of his purpose. In the first two chapters a more or less general or abstract discussion of the principles of valence and resonance is given. These are applied in the next six chapters to a series of selected fields, namely, energy of molecules, steric effects, dipole moments, molecular spectra, chemical equilibrium, and rates of reaction.

The point of view throughout naturally follows closely that of Pauling. Most of the discussion represents a well-documented review of previously published work. There are, however, a number of points upon which entirely original opinions are expressed and in which there is still room for considerable argument. The chapters on resonance energy and steric effects are especially well done and a very useful feature of the book is the inclusion as an appendix of a table, complete to June, 1943, of interatomic distances in organic molecules. The book should certainly be in the hands of all organic chemists working in any field involving resonance interpretations.

M. CALVIN

Introductory General Chemistry. By STUART R. BRINKLEY, Associate Professor of Chemistry, Yale University. Third Edition. The Macmillan Company, 60 Fifth Ave., New York, N. Y., 1945. x + 645 pp. 22 × 15 cm. Price, \$4.00.

A comparison of the table of contents of this edition with those of the first and second editions convinces one that the author is trying hard to find the best possible order of presentation of the material ordinarily included in a course in General Inorganic Chemistry. Whether or not he has solved the problem of order of treatment will, no doubt, depend upon the point of view of the individual teacher. At any rate, Professor Brinkley builds up a very good case for the particular order which he has chosen and proceeds, very logically and realistically from one topic to the next.

To appreciate, fully, the extent to which the order of treatment has been changed one must, practically, read the whole book. On doing so one finds that the whole text has been almost completely rewritten. Some of the specific changes in order to be noted are the following:

The atomic theory concept is introduced in Chapter 2 instead of Chapter 5. Chemical equilibrium is discussed in Chapter 8, directly following hydrogen, water and solutions. The alkali metals and hydroxides are taken up in Chapter 10, before the discussion of the halogens and hydrohalic acids in Chapter 11. A specific Chapter, 17, is devoted to acids, bases, ampholytes and hydrolysis, and follows the discussion of ionization and ionic reactions. Acidity and basicity are discussed in terms of the Brönsted generalized definitions which are then used consistently throughout the remainder of the book. The discussion of the analytical separation of metals ions has been moved from Chapter 28 to Chapter 18; where it now falls before oxidation-reduction in solution. The order of treatment of nitrogen and sulfur has been reversed, sulfur and sulfuric acid being taken up before nitrogen, ammonia and nitric acid.

The discussion of elements and their compounds is based largely on the classification according to the periodic table. The number of different organic compounds discussed has been increased. All photographs have been omitted, leaving only a comparatively small number of line drawings; although this increases the average amount of descriptive material per page it tends to give the book a somewhat crowded appearance. The section on problems has been enlarged, but no effort has been made to discuss the solution of problems.

To really measure the quality of a textbook, one must use it and, in that way, find out how well it actually serves the needs of the student and the teacher. However, "Introductory General Chemistry" impresses the reviewer as a genuinely fine textbook, completely up-to-date, worthy of careful examination by a teacher seeking a comprehensive textbook for a comprehensive course.

C. H. SORUM

Dictionary of Organic Compounds. Volume One. New, Revised and Enlarged Edition. I. M. HEILBRON and H. M. BUNBURY, Editors. Oxford University Press, 114 Fifth Avenue, New York 11, N. Y., 1943. With 1943 Supplement to Volumes II and III. 1072 pp. \$30.00. (Complete set of Volumes I, II and III with Supplements, \$75.00. Price of separate Supplements, \$1.00 each.)

The appearance of the revised edition of Volume I of the now well-known "Dictionary of Organic Compounds," together with the reprinting of the original volumes II and III, and the appearance of supplements to the latter, undoubtedly has met with approval by organic chemists.

In the new volume, and the supplements, the literature has been covered up to the end of 1940, and, wherever possible, reference to papers appearing in 1941 and 1942 has been made. The revised volume I contains a wealth of new material, and care has been taken to bring the old material up to date in those cases in which further progress has been made since 1934.

In general, an adequate picture of the place of these volumes in the chemical literature may be obtained from the earlier reviews (THIS JOURNAL, 58, 1064 (1936); 57, 231 (1935)) which followed their initial appearance. The work provides a ready and convenient source of reference to a great many organic compounds. A brief summary of chemical and physical properties is given for each compound, and usually one or more common derivatives are mentioned. One or more leading references are then included. A particularly attractive feature is the presentation of a full structural formula for each compound. No information has been given as to the criteria used in selection of compounds for inclusion, and it should be emphasized that the failure to find a compound in the work does not imply that that compound is not known. It is further true that the facts recorded in the case of a compound which does appear are not necessarily complete, nor are the references complete; further, the derivatives listed are not necessarily the most characteristic ones for the substance described. If these be defects, they are defects inherent in the plan of producing such a work. Inclusion of all compounds, with complete references, would involve the preparation of an equivalent of Beilstein, which, whatever its form, or method of presentation, could hardly be less unwieldy or expensive than that indispensable standard work. The much more circumscribed task which the compilers of the "Dictionary" have set themselves has been done exceedingly well. Through their efforts the work of a literature search will in a great many cases be much simplified, by finding with a minimum of effort in the "Dictionary" a leading reference which will serve to put the investigator on the right track. The very complete coverage of natural products, both of known and unknown structure, is a very valuable feature. If future revisions are contemplated, more thorough inclusion of ultraviolet absorption data, where known, would greatly enhance the value of the work.

The "Dictionary" is more than a handbook; it is less than Beilstein. In its place, there is nothing to compare with it, and the editors and compilers are to be congratulated on their valuable addition to the chemical literature.

R. B. WOODWARD

BOOKS RECEIVED

April 10, 1945 to May 10, 1945

JULIUS A. NIEUWLAND AND RICHARD R. VOGT. "The Chemistry of Acetylene." A. C. S. Monograph Series. Reinhold Publishing Corporation, 330 West 42nd Street, New York, N. Y. \$4.00.

R. NORRIS SHREVE. "The Chemical Process Industries." McGraw-Hill Book Company, Inc., 330 W. 42nd Street, New York, N. Y. 957 pp. \$7.50.

W. SWIETOSLAWSKI. "Ebulliometric Measurements." Reinhold Publishing Corporation 330 West 42nd Street, New York, N. Y. 228 pp. \$4.00.

ANSELM TALALAY AND MICHEL MAGAT. "Synthetic Rubber from Alcohol." Interscience Publishers, Inc., 215 Fourth Avenue, New York 3, N. Y. 298 pp. \$5.00.