NEW BOOKS.

DAS OPTISCHE DREHUNGSVERMÖGEN ORGANISCHER SUBSTANZEN UND DESSEN PRAKTISCHE ANWENDUNG. BEARBEITET VON DR. H. LANDOLT, Professor der Chemie an der Universität zu Berlin. Unter Mitwirkung von DR. O. SCHÖNROCK, DR. P. LINDNER, DR. SCHÜTT, DR. L. BERNDT, DR. T. POSNER. Zweite gänzlich umgearbeitete Auflage. Mit Abbildungen. xxiv + 655 Seiten. Braunschweig: Vieweg und Sohn. 1898. Price, M. 18.

The property of certain substances, of rotating the plane of polarized light, has long been known and has been the object of much research. The practical applications of this knowledge, however, attained a high degree of accuracy and usefulness before the theory of the phenomenon was understood or any but the most superficial explanations were offered for it. The way was first opened to definite knowledge concerning the cause of the rotatory powers of chemical compounds when, in 1874, J. H. van 't Hoff, of Utrecht, and J. A. LeBel, of Paris, announced in papers, separated by only a few weeks, a new theory; *viz.*, that optical activity stood in intimate relation to chemical structure. Indeed this was the beginning of a new epoch in chemical science. In sympathy with the suddenly developed interest in the subject, Professor Landolt, then of the Polytechnic School at Aix-la-Chapelle, brought out in 1879 a modest work of 237 pages, entitled "Das optische Drehungsvermögen organischer Substanzen und die praktische Anwendung Desselben." At that time this was the only work in existence which summed up what was known on the subject. In the nineteen succeeding years no other branch of chemistry has shown greater development or offered more complete and convincing verification of a fundamental theory than that called stereochemistry. Indeed such a mass of proof has been presented that the van 't Hoff–LeBel hypothesis has been generally accepted. In this new edition of his work the author says, "The principle of the asymmetric carbon atom may be designated as one of the best established theories of chemistry."

The second edition of Professor Landolt's monograph naturally records the immense strides made in this field. The book itself has grown to 655 pages and the number of optically active bodies known in 1879, *viz.*, 300, has increased to 700, for which

the specific rotation has been calculated with more or less attention to the conditions affecting accuracy. So far as the writer is informed this still remains the only work of its kind, but no number of rivals could diminish the appreciation one feels when he realizes the immense amount of material which has been carefully digested and notes the clear and systematic form of its presentation. Even the mechanical features of the book, the paper and the clear type of different sizes which the German book-makers so successfully employ to indicate the relative values of sections and paragraphs, are in keeping with the beautiful phenomenon, and the elegant theory to which it is devoted. It is written from the chemist's standpoint with such exposition of purely physical principles as to render them intelligible to other than physicists. No important details are omitted, but it is apparent that much of doubtful authenticity has been excluded. The literature citations are quite full, and this, of course, is of great value in a book of this kind. An interesting feature is the frequent and appropriate reference to the historical features of certain theories and reactions. The practical applications made of the rotatory powers of such substances as the carbohydrates, alkaloids, camphor, etc.; descriptions of the various instruments employed in the measurement of this power with directions for their use; all receive their full share of attention.

Those who have not followed recent advances in this field will find here admirable summaries of researches and important generalizations not otherwise accessible except as diffused through journals. It is of interest to learn that while in 1879 only four substances were known to exist in different optical modifications, *viz.*, tartaric acid, maleic acid, camphor, and camphoric acid, now over one hundred are recorded, of which most are known in the laevo, dextro, and inactive forms. Interesting sections are devoted to the formation and separation of racemic compounds, describing the methods used with such fruitful results by Fischer, Liebermann, Ladenburg, Lewkowitsch, Frankland, and others. Considerable space is devoted to the discussion and summing up of our knowledge of multirotation, the puzzling phenomenon concerning which many theories have been advanced and none accepted. Professor Landolt expresses himself to the effect that it is settled that the cause of multirota-

tion of sugars is to be found in the existence of isomeric modifications which in aqueous solutions are transformed (*umgewandelt*) the one into another.

The chief divisions of the work are six; *viz.*, I. General Discussion of Optical Activity; II. Physical Laws of Circular Polarization; III. Specific Rotation; IV. Apparatus and Methods for Determining Specific Rotation; V. Practical Applications; VI. Rotation Constants of Active Bodies.

The work is admirable from every standpoint and will be indispensable to the chemist or physicist who hopes to maintain footing in this important field. W. E. STONE.

SPECTRUM ANALYSIS. By JOHN LANDAUER, LL.D.; authorized English edition by J. BISHOP TINGLE, PH.D., F.C.S. New York: John Wiley & Sons. x + 239 pp. Price, $3.00.

This is the translation of Dr. Landauer's article in Fehling-Hell's Handwoerterbuch, which has been republished as a separate book. Dr. Tingle recommends it as a text-book for American students of chemistry.

While commending the book to the attention of chemists already familiar with the principles of spectroscopy, the reviewer does not think it adapted to the use of beginners. No connected directions are given for the adjustment and use of the spectroscope and spectrometer; not even a diagram showing the use of the various parts; no suggestions for practice in the identification of lines or detection of elements. In fact, the attention of the writer is mainly directed to work that requires the most expensive apparatus and practiced manipulation. While use is made, from the outset, of such terms as "D line," "K line," etc., we must proceed to Chapter IX, before reaching a cursory account of Fraunhofer's notation. In the introductory discussion of the properties of light, no attempt is made to connect the refractive index with λ: consequently "dispersion" must be treated aphoristically. Total reflection is ignored: consequently the third tube of the spectroscope remains an enigma. By neglecting interference, diffraction is explained so obscurely, that the subsequent exposition of Prof. Rowland's work would be incomprehensible, without outside help. Practical applications of spectroscopy, that would interest the chemist, rather than the astronomer, fare badly. The two lines devoted to forensic ex-