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-

amination and the four which mention the spectroscopic control of the Bessemer, could not have been found without the index.

All of this merely proves that a cyclopedia article cannot do duty as a text-book, and it is to be hoped that the first five chapters will be recast for subsequent editions. The latter part of the work shows admirable industry in the collation and recalculation of material, and good judgment in the elimination of superseded and unsatisfactory data. Exception might be taken to the omission of Michelson's work with the refractometer, of reference to hypotheses concerning fluorescence, and of discussions over atom-spectra and molecule-spectra. On the other hand, praise must be given to the lucid and impartial exposition of researches into the mathematical relations of spectral lines and their connection with chemical properties, as well as to the discussion of solar and astral spectra. It would be a valuable addition to the reference library of every chemist.

Dr. Tingle's translation is easy and idiomatic, the only solecisms being the persistent use of 'discovery,' for 'Erfindung,' and of the indefensible term 'magnetic current,' on page 75.

MORRIS LOEB.

ON LABORATORY ARTS. BY RICHARD THRELFALL, M.A., Professor of Physics in the University of Sydney. New York: The Macmillan Co. 1898. xii + 338 pp. Price, $1.50.

The rather indefinite title of this book and the purpose for its existence, may be explained by quoting from the preface: "It is true that in a well-appointed laboratory, where apparatus is collected together in greater or less profusion, the appeal is often indirect, and to a student carrying out a set experiment with apparatus provided to his hand, the temptation to ignore the mechanical basis of his work is often irresistible. It often happens that young physicists are to be found whose mathematical attainments are adequate, whose observational powers are perfectly trained, and whose general capacity is unquestioned, but who are quite unable to design or construct the simplest apparatus with due regard to the facility with which it ought to be constructed. .... It is the object of the following pages to assist the young physicist in making his first steps towards acquiring a working knowledge of 'laboratory arts.'"

The book is divided into four chapters, and the material con-