

erals. Just why columbium and tantalum do not find a place here for the same reason is not altogether clear; but of course a limit had to be set.

Part I. classifies the minerals as follows: (1) silicates; (2) titano-silicates and titanates; (3) tantalo-columbates; (4) oxides and carbonates; and (5) phosphates and halides. Such a classification of the one hundred and fifty or more rare-earth minerals, giving the percentages of the chief rare earths present, is useful and has already been adopted by other authors. A valuable addition to this list is the giving of the locality where the minerals are found.

Part II. discusses adequately and satisfactorily, on the whole, the chemistry of the elements. A fair amount of attention is given to the separation processes so many and complicated in this group. The spectroscopic methods, absorption, spark, arc and cathode luminescence, methods themselves of the highest value, are duly emphasized, and Urbain's recent application of magnetic susceptibility receives its proper consideration. It is of interest to note that the lanthanum test consisting of a blue color when iodine is brought into contact with the hydroxide find a place in the book, although no one of whom the reviewer knows has been successful in applying it.

Part III. is concerned mainly with an account of the development of the incandescent light industry. This is a most instructive history, and deserves all the space assigned to it, as it has given the main impetus to rare-earth investigation during the past thirty years.

A feature which commends the book is its international scope. American, English, French and German chemists will find their work fairly represented.

The book is an important contribution to inorganic chemistry, and should be in the library of every inorganic chemist for study or at least for reference.

PHILIP E. BROWNING

Relativity and the Electron Theory. By E. CUNNINGHAM. Longmans, Green and Company, London. Pp. vii + 96.

The author has a large work on this subject printed by the Cambridge University Press and now presents a short monograph, from which the more difficult mathematical work is omitted. The result is a book which may be read without serious effort, even by persons not specialists in the theory of relativity or in mathematical physics. The titles of the chapter are: I. Introductory; II. The Origin of the Principle; III. The Relativity of Space and Time; IV. The Relativity of the Electro-magnetic Vectors; V. Mechanics and the Principle of Relativity; VI. Minkowski's Four-Dimension Vectors; VII. The New Mechanics; VIII. Relativity and an Objective *Æther*. Throughout the work emphasis is laid upon the physical foundations of relativity and upon its physical consequences. Something is also said of the philosophical meaning of relativity.

The natural book with which to compare Cunningham's is Carmichael's Monograph, "The Theory of Relativity," published by John Wiley and Sons. The essential element of contrast is that Carmichael proceeds in the Euclidean fashion from definite assumptions or postulates to definite theorems; whereas Cunningham writes in the ordinary style of the physicist. The one lays greater stress on logical foundation, the other upon the physical connections of the theory. So different is the point of view that even though the results overlap to a large extent, any reader of one of the monographs would find much additional interest in reading the other. The change in the concepts of mass and time and space which is suggested by the theory of relativity is so perplexing to many persons that the reading of both these texts will be none too much to allay their anxieties. The mathematician should begin with Carmichael and the physicist with Cunningham.

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