

Nevertheless there is much in the book to be commended. The discussion of the metals and of the practical applications of chemistry is as a rule fairly satisfactory. A text on chemistry with preface dated January, 1909, however, should not contain the statement that helium has not been liquefied.

WILLIAM MCPHERSON.

Die Härte der festen Körper und ihre physikalisch-chemische Bedeutung. VICTOR PÖSCHL. Dresden: Theodore Steinkopff. 1909. 8vo., 85 pp., 4 fig. Price, M 2.50.

There are undoubtedly intimate relations between the chemical composition, the crystal form, hardness and density of bodies. Of these properties hardness presents the least satisfactory data because no really accurate and widely applicable method of measuring hardness has been agreed upon. The old scale of Mohs of ten minerals ranging from diamond to chalk is too indefinite. The object of the author in this book is to set forth a method of measuring hardness which appears to give an accurate numerical expression of it and to summarize some of the relations which may be pointed out between hardness and tenacity, frangibility, solubility, composition and crystal form.

He defines hardness as the force which must be overcome to tear a particle of a substance from its neighbors. He gives a summary of the methods used heretofore in measuring hardness—planing, bending, impressing and grinding. His own method consists in making a "scratch" with a diamond under definite load and estimating under the microscope the *volume* of substance removed. In comparison to the scale, 1, 2, 3–8 he obtains 5, 21, 50, 167, 122, 240, 667, 1000 for talc, rock salt, calcite, fluorite, apatite, orthoclase, quartz and topaz respectively. Such a scale obviously offers a chance to express small differences of hardness such as obtain on different crystal faces or between polymorphs. The author of course has difficulties when he attempts to predict the hardness of a compound from the hardness of its elements, but the discussion along this line is interesting.

The book is a brief but suggestive contribution to the study of hardness.

ROGER C. WELLS.

A Text-book of Physics, edited by A. WILMER DUFF. Second edition, revised, 525 illustrations, xi + 698 pp. Philadelphia: P. Blakiston's Son & Co., 1909. Price, \$2.75 net.

The first edition of this book was reviewed in *THIS JOURNAL*, 31, 429. In this edition "The part on wave motion has been entirely rewritten and numerous changes have been made in several other parts." That the book is a successful one is indicated by the appearance of a second edition after so brief an interval.

W. A. N.

A Text-book of Physiological Chemistry, for Students of Medicine. By JOHN H. LONG, M.S., Sc.D., Professor of Chemistry in Northwestern University Medical