

for use in secondary schools where the subject is taught in the class room alone.

O. L. SHINN.

The Periodic Law and the Hydrogen Spectrum. By W. F. KEMBLE AND C. R. UNDERHILL. pp. 1-16; 5 figs. New York: D. Van Nostrand Co., 1909. Price, 50 cents.

It is somewhat hard to comprehend exactly what the authors of this pamphlet are driving at. They state, however, in the preface, that they "have endeavored to show a connection between the possible action of a spiral nebula and the Periodic Law;" that they "find a surprising relationship between the series [of strong lines in the hydrogen spectrum] and the order of recurrence of the elements of greatest atomic volume;" and believe that they "have herein shown some of the fundamental principles of the long-sought laws which have stood as a mere dividing line between the sciences of physics and chemistry!" *Verbum sat sapienti.*

J. JOHNSTON.

Outlines of Chemistry. A Text-book for College students. By LOUIS KAHLENBERG, 548 pages. New York: The Macmillan Co. 1909. Price, \$2.60.

That elementary chemistry is recognized as a part of the most important work in the chemical laboratory, requiring the best judgment and experience, is evident from the fact that in most institutions the Freshman course is in charge of the head of the department. The large number of excellent text-books that have appeared within recent years still further emphasize its importance. Doubtless the preparation of numerous works on this subject has received a stimulus from the recent great expansion of physical chemistry. Without question the experimental method has been greatly improved by the free use of theoretical conceptions, yet in some instances, it is to be feared that the desire to prepare an up-to-date work has led the author to include much theoretical matter that is really beyond the beginner to assimilate—matter that properly belongs in the Sophomore or Junior courses in physical chemistry.

The point of view from which Professor Kahlenberg's book is prepared is well set forth in the preface—the book is to be used in connection with a course of experimental lectures and laboratory exercises representing a year's work in chemistry in college—it is intended to meet the needs of students who are preparing for careers in chemistry, pharmacy, medicine, engineering, agriculture, or for work in natural sciences, or as a means of general culture.

The first five chapters are mainly devoted to experimental work on hydrogen, oxygen and chlorine as a foundation of fundamental facts and laws for the sixth chapter in which the atomic and molecular theories are presented. After two chapters devoted to ozone, hydrogen peroxide, allotropy and the halogens, in Chapter IX acids, bases and salts, hydrolysis, mass action, and chemical equilibrium are concisely defined on

the basis of facts. Chapter XVII includes the elements of thermochemistry; Chapter XX, classification of the elements and the periodic system; and Chapter XXIV, solutions, electrolysis, and electrochemical theories. In this arrangement of the essential parts of chemical theory, and with this mode of treatment, it would seem that the author has kept well within the limits of what the average college student can readily comprehend and assimilate. As stated in the preface, the student becomes a clear logical thinker, and he does not look upon the atomic and molecular theories as something arbitrary, metaphysical and well-nigh incomprehensible; it is also mentioned that in principle this is the method of Bunsen and of many other successful teachers of chemistry. Historical connections are kept sufficiently in view by frequent allusions. The cuts are clear and well made, and the subject matter well printed.

The experimental and descriptive parts are well selected; the more important industrial processes are briefly described, and the chemical reactions involved are as fully explained as the scope of the work permits. There is an occasional omission of details in allusions to methods of preparation that perhaps could have been avoided without undue expansion of the text, such, for example, as in the Solvay process, saturation first with ammonia and then the clarified solution with carbon dioxide; the use of ferric oxide as a catalyzer in the Chance-Klaus process for recovery of sulphur; the Dow electrolytical processes in Michigan that supply a large part of the output of the bleach, bromine and potassium bromide in this country. The Kessler process for the concentration of sulphuric acid that is replacing platinum is not mentioned; Javelle water is mentioned as a solution of bleaching powder; it is stated that the hydrocarbons in American petroleum practically all belong to the so-called paraffin series, of which methane is the first member. But these points are of minor importance to be kept in mind in the more complete presentation by lectures.

A critical examination of this work gives the impression, I think, that the author has accomplished his purpose, and that he has given us one of the best books, and in some respects the best book that has been prepared on this subject.

CHARLES F. MABERY.

Elementary Chemistry. By FREDERIC B. EMERY, A.M., McKinley High School, St. Louis, Mo. xiii + 666 pages. Easton, Pa.: The Chemical Publishing Co. Price, \$1.50.

The method adopted by the author is practically the same as that followed in most of the widely used texts. The book is divided into four parts. Part I contains the introductory chapter (17 pages), a description of the non-metallic elements and their compounds (216 pages), a description of the metallic elements and their compounds (114 pages), and a short discussion of organic compounds (55 pages); Part II includes an extended