

based upon the best sources and made with great care. The chapter adds much to the value of this volume as a book of reference.

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*The Development of the Periodic Law.* By F. P. VENABLE, Ph. D., Professor in the University of North Carolina. Easton, Pa., Chemical Publishing Company. 1896. Pp. viii+321. Price, \$2.50.

The purpose of this book cannot be better given than in the author's own words: "This work \* \* \* is to be used for purposes of reference and of study, and not as a mere history of the subject. The errors and repetitions of the writers upon this subject in the past few years have abundantly proved the necessity for some such gathering and systematizing the work of former years."

Professor Venable's work in writing his recently published History of Chemistry has given him an excellent preparation for the critical study of the discovery and development of the periodic law, which is given in this volume. As stated by the author, much of the literature of the subject is in hidden and out-of-the-way places and a very real service is rendered to chemical science in thus coordinating it and making it more easily accessible. The scope of the book includes an account of the numerous attempts which have been made to discover numerical and other relations between the atomic weights and also an account of speculations as to the origin of the elements and their relation to some fundamental form of matter.

Calculations and speculations of this kind have had a fatal fascination for a great many chemists, and as we look over the literature and see how much has been written that is fanciful, and how much that in the light of better knowledge has been found erroneous and worthless, we are almost tempted to turn from the whole subject in disgust. And there is no doubt that many of these speculations have been worthless and the time of their authors has been nearly or quite wasted, for they have led to no accepted conclusions and they have given no incentive to useful work. But the periodic system stands on quite a different plane, for it

furnishes us the best means at present available for coordinating our knowledge of the chemical elements, and it has furnished the incentive for a large amount of most excellent experimental work. That there are some imperfections in the system and that it does not, at present, give any accurate mathematical expression for our chemical knowledge must be admitted. It is tantalizing in its suggestiveness, and most chemists believe that it half reveals facts which will be of profound importance when fully understood. If the present work turns the attention of chemists in that direction it may prove very useful.

A quite full bibliography and an excellent index add to the usefulness of the work.

W. A. N.

*Notes on Qualitative Analysis*, arranged for the use of students of the Rensselaer Polytechnic Institute. By W. P. MASON, Professor of Chemistry. Third Edition. Easton, Pa., Chemical Publishing Company. 1896. Pp. 56. Price, 80 cents.

This book gives a concise statement of the more important qualitative tests for metals and acids, those for the metals being arranged in the order of Fresenius. Then follow tables for analysis of metals, and five pages giving very short directions for the analysis of alloys, insoluble substances and alkaline solutions.

The selection of tests is satisfactory and the book will, doubtless, furnish a basis for a good short course in the subject. It would seem, however, that even an elementary work should give directions which are reliable for cases of very common occurrence. For instance, ammonia often fails to separate small quantities of silver chloride from mercurous chloride; and ammonia will not separate zinc from chromium unless the zinc is in excess. Neither case is provided for in the directions given.

Books of this character may furnish students with excellent drill in scientific methods of work and, in the hands of a good teacher, are satisfactory from that standpoint, but the student should understand that he is liable to fall into very serious mistakes if he attempts to use the directions for practical work.

The references to Watts' dictionary and the