

But these are all very slight defects and on the other hand the chapter on atomic and molecular weights is a most excellent presentation of this subject. The important steps are here set forth in their historical order and so clearly that they cannot fail to interest both teacher and students.

This text-book has so many excellent points that it deserves to be very extensively used and can be most heartily recommended.

EDWARD H. KEISER.

LEITLINIEN DER CHEMIE. BY WILHELM OSTWALD. Leipzig: Akademische Verlagsgesellschaft m. b. H. 1906. V + 308 pp. Price, 6.60 Marks: Bound, 7.50 Marks.

In the Fall of 1905 Ostwald delivered a course of lectures at the Massachusetts Institute of Technology. The following January he gave the same course at Columbia University. He has now re-written the lectures and published them under the title given above. His intention was to present, briefly, the history of the development of the most important conceptions of scientific chemistry in such a way that the book might be available to all interested in natural science. The subjects of the lectures are: 1. The Elements. 2. Combining Weights and Atoms. 3. The Gas Laws and the Molecular Hypothesis. 4. Isomerism and Constitution. 5. Electrochemistry. 6. Affinity. 7. Chemical Dynamics.

The treatment of these topics, although brief, is eminently satisfactory. The historical facts are clearly brought out, but a great part of the interest felt by the reader is due to the illuminating comments of the author. It is instructive, to learn that in discussing isomerism and constitution, he finds himself compelled to make use of the atomic theory, although he hopes that an "hypothesis-free" representation of molecular structure may soon be given, and indicates, in a general way, a method for the solution of the problem. Ostwald justifies the appearance of the book on the ground that it gives greater prominence to the history of the formation and clarification of general concepts than to the discovery of the facts and their practical application. This is, in fact, its chief merit and it may be confidently recommended to chemists looking for a clear and succinct discussion of the topics previously mentioned. It is to be regretted that a table of contents and an index are lacking.

L. B. HALL.

A HISTORY OF CHEMICAL THEORIES AND LAWS, BY M. M. PATTERSON-MUIR. 8vo. pp. xx + 555. John Wiley & Sons, New York, 1907. Price \$4.00.

This is a suggestive book which will prove both interesting and profitable to the reader. And yet it is difficult to take an entirely favorable view of it as a history of the chemical theory. Professor Patterson-Muir is right in saying that "the methods, achievements and aims of the science can be realized only by him who has followed the gradual development of chemical ideas." And hence it is very necessary that the study of

theoretical chemistry be taken up from the historical standpoint. It is extremely difficult, however, to write a history of chemical theory which is not at the same time and for the larger part a text-book on theoretical chemistry. This would produce something like the rich and comprehensive work of Lothar Meyer. To reverse the relative proportion of theory to history scarcely seems desirable. Thus the detailed account of the rather blind and selfish groping of early alchemists and philosophers into which the author reads a searching for what he styles "the one thing" while exhibiting a wide reading really does little to classify matters and bring any nearer the author's professed goal of a "just judgment." Nor are the terms which the author would substitute for well-known ones always happy or helpful. It takes a good deal of explanation to show how the term *class-marks* is an improvement upon the ancient *principle* or *elements*. The word *element* is later abandoned almost entirely for Boyle's *homogeneous* or *distinct substance*—a more euphonious but not much more satisfactory term than Davy's *undecompounded bodies*. The author divides his book into,

I. The history of the attempts to answer the question, What is a homogeneous substance.

II. The history of the attempts to answer the question, What happens when homogeneous substances interact.

It may be said that the chapter on "Elements which do not react" is scarcely satisfactory from the standpoint of history and is certainly most incomplete from the theoretical point of view. The chapter on the Periodic Law lacks clearness of coordination, the winnowing out of unimportant material and critical discussion or summing up of the material gathered. The discussion of the hypothesis of ionization is well done.

The book shows wide reading of original sources and can be helpfully studied in connection with the more clearly arranged and digested treatise of Lothar Meyer.

F. P. VENABLE.

PHYSICAL CHEMISTRY IN THE SERVICE OF MEDICINE. SEVEN ADDRESSES BY DR. WOLFGANG PAULI. Translated from the German by Dr. Martin H. Fischer. New York; John Wiley & Sons, 1907. VIII + 156 pages. Price \$1.25.

Six of the addresses which are brought together in this very readable translation were delivered before societies of medical men in Vienna and Leipzig, between 1899 and 1905, and were, in part, published later in scientific journals. The seventh essay, Number II as printed, was published some years ago as the first article in the first volume of the *Ergebnisse der Physiologie*, under the title, "The General Physical Chemistry of the Cells and Tissues."

These essays deal largely with the important problems of the chemistry of the colloids and present a resumé of our knowledge on the subject as