

upon as a good exposition of the various views upon a subject, the development of which is due to the labors of the author himself. The observations are of so manifold a nature, that the perusal of the book cannot fail to be of value to all interested in the subject.

H. ENDEMANN.

A HISTORY OF PHYSICS IN ITS ELEMENTARY BRANCHES, INCLUDING THE EVOLUTION OF PHYSICAL LABORATORIES. BY FLORIAN CAJORI. New York and London: The Macmillan Co. 1899. viii+322 pp. 12mo. Illustrated.

In this convenient volume the author sketches the progress of the growth of mechanics, light, electricity and magnetism, meteorology and sound under the Greeks, the Romans, the Arabs, in Europe during the Middle Ages, and the Renaissance as well as through the succeeding centuries to the present time. There are also chapters on the atomic theory, the causes of failure of Greek physical inquiry, gunpowder and the mariner's compass, and the inductive method of scientific inquiry. The author feels that "some attention to the history of a science helps to make it attractive," and has written the book in hopes of stimulating students and teachers of physics. Dr. Cajori cites a sentence written by Ostwald, who points out as a "defect in the present scientific education of youth, the absence of the historical sense and the want of knowledge of the great researches upon which the edifice of science rests," and he hopes that this volume will assist in remedying the defect.

The necessity of limiting the book to 300 pages has caused great condensation of statement, and prevented elaboration of principles; students who wish, however, to pursue further special lines, will find abundant references to literature throughout the volume; these show a wide acquaintance with the sources of information on the part of the author. Biographical sketches of those who have distinguished themselves by their notable discoveries and inventions are among the features of the volume.

In looking through this record one cannot but notice the occurrence of national jealousy in respect to priority of discovery. Germany, France, England, Holland, Italy, and at a later period the United States of America, each puts in a claim for having taken the first step in several prime discoveries and

inventions. The cases of the thermometer and of the electric telegraph will occur to every one. In many cases the conflict for priority is due to the fact that similar thoughts occur independently to more than one person, and oftentimes an invention is a growth to which several individuals have contributed. Few philosophical instruments are perfect at their birth, the barometer being a notable exception.

Professor Cajori's book can be recommended to students who really want to master the historical aspects of physical science.

H. CARRINGTON BOLTON.

CHEMISTRY AND METALLURGY APPLIED TO DENTISTRY. BY VERNON J. HALL, PH.D., Professor of Chemistry and Director of the Chemical Laboratories in the Dental School and in the Woman's Medical School of Northwestern University. xii + 246 pp. Evanston, Ill.: The Technical Press. 1898.

There are, probably, many members of the American Chemical Society who will have but a vague idea as to the precise field which this book is designed to fill. For the benefit of such members, it may be said that the book is but one recognition of a general change in methods of instruction now actively progressing in dental schools; namely, the introduction of really meritorious courses in the sciences of pathology, anatomy, physiology, and chemistry, as necessary adjuncts to the purely practical courses in operative dentistry and dental prosthesis.

The metal work of dentistry being of such eminent practical importance to the profession, it naturally follows that metallurgy is that department of chemical teaching which is most emphasized in dental schools. Hence a demand for specialized textbooks on "dental metallurgy."

We do not think that the book before us is destined to take any prominent place in the development outlined above; unless, perhaps, as an adjunct to Professor Hall's lectures. Its laying out of a systematic laboratory course on the physical properties of metals is timely and meritorious; as is also the practice in the refining of certain metals. The work is decidedly weak, however, in two points: it is replete with partial truths, which are almost unavoidably uninformative or misleading; and it barely touches upon the philosophy of the subject-matter. It therefore fails as a compilation, or as an index to progress—both of which