

knowledge of this subject. The arrangement of the present edition is based on the periodic system of Mendelejeff and Lothar Meyer, and it presents a logical sequence of fact and theory according to the inductive method. The book is considerably enlarged from former editions by the introduction of chapters on the periodic law, relations of chemical affinity, and a brief statement of the theories of solubility and thermochemical phenomena. These are useful additions since training in elementary chemistry cannot now be considered complete unless these recent conceptions of chemical theory receive some attention.

The introduction seems a little heavy for a beginner, but for the best use with beginners as with any good text-book much depends on the skill and faithfulness of the teacher. For rapid advance, it is essential that the student gain a clear idea as to what chemistry is before proceeding to the study of facts and phenomena. Doubtless this is best accomplished by a brief preliminary statement of elementary principles, illustrated by experiments to be performed by the student.

This edition appears at an opportune moment, and it will doubtless meet with the favor it deserves.

CHARLES F. MABERY.

THE ELEMENTS OF PHYSICS. BY HENRY CREW. Second edition. xvi + 353 pp. New York: The Macmillan Company. 1900. Price, bound, \$1.10.

In the preface to the first edition, the author said: "Physics is not a series of disconnected subjects, including mechanics, sound, light, heat, and electricity. It is, on the contrary, a body of well-organized truth, forming one great whole. \* \* \* A science covering fields apparently so diverse, yet so intimately connected, demands an elementary treatment which shall be rigidly consecutive."

The more important changes from the first edition are the following: "All use of the method of limits, either for defining physical quantities or for other purposes, has been abandoned. All Greek letters, except  $\pi$ , have been replaced by English symbols. All use of trigonometrical functions has been given up."

These changes are good ones from the point of view of the teacher of physics. On the other hand, the student would certainly find his calculus come easier if he saw from the start

the advantage of the differential notation. A bright boy sees at once that algebra is an improvement over arithmetic, but he does not see the advantages of the calculus at the time when he is studying the subject. It seems as though the teacher of physics might with profit, present his subject so that the student would feel the need of more advanced mathematics. This, however, is a debatable question, and the author has the argument of experience on his side. His book is certainly a good one.

WILDER D. BANCROFT.

L'EAU DANS L'INDUSTRIE. PAR H. DE LA COUX. Paris. V<sup>e</sup> Ch. Dunod, Editeur. 49 Quai des Grands-Augustins. 1900. Price, 15 francs.

As the name "water in the industry" (or industrial arts) indicates, this work by M. De la Coux, a chemical engineer and professor of industrial chemistry for the Polytechnic Association in Paris, takes up the several questions connected with the utilization of water, natural and acquired impurities, and the means for removing the same, and lastly the methods of testing and analysis. The scheme of treatment is reasonably comprehensive, and in some portions is very adequately and fully developed, and in others, not so completely as in other works already available.

The distinctive characters and differences of composition of the various classes of natural waters are first stated, and the solubility of certain salts in water considered from the industrial point of view; as for example, the effects on the boiling of water.

The next section on the use of water in boilers and for the raising of steam, the difficulties from the development of incrustation and so-called "boiler-scale," the remedies and means of removal of incrustations, both mechanical and chemical, is very full and satisfactory in its treatment. Not only are the several chemical salts which have proved of value as scale-removing materials discussed separately, but the calculations given by which (the extent of the impurity in the water being known) the amount of correction needed may be ascertained. The means of purifying mine waters and salt water to make them available for boiler purposes is also very thoroughly covered.

The employment of water in special industries is then noted and the requirements and conditions of purity in each discussed. Thus, the use of water in the textile and tinctorial industries, in