

coordinated chart strikes the eye at once. The very instructive illustration on page 7, showing the relations between "height of ground water," "extent of sewerage," and the "typhoid death-rate," could have been improved had the ordinates for the "ground water curve" been increased. Printed as it is, the scale is too small for easy reading.

Referring to the correspondence between an improved typhoid death-rate and the introduction of purer municipal water supplies, the author says, "other circumstances may have had something to do with this reduction, such as better care of the sick." This is true, but it could have been added that improvement in the typhoid rate not uncommonly antedates the sanitary betterments, because of the private purchasing of drinking water from other and purer sources.

The author forcibly presents the care exercised by European authorities in furnishing the consumers with water, either unpolluted or else improved to the greatest extent permitted by sanitary science; and he graphically illustrates what may be expected if Americans continue to use raw water from sources such as those whence many of our cities now draw their supplies.

The book is well worthy of a place in the library of every one interested in the water question, whether his interest be that of a citizen or of a specialist.

W. P. MASON.

ELEMENTS OF CHEMISTRY. BY RUFUS P. WILLIAMS. viii + 412 pp.
Boston: Ginn & Co. 1897. Price, \$1.20.

Personal contact with twenty-five hundred pupils in chemistry and some experience in the preparation of text-books, have made it possible for the author of this work to prepare a book unusually free from erroneous statements. It resembles the "*Introduction to Chemical Science*," an earlier book by the author, but nearly all topics are treated with greater fulness, and the text is less marred by abbreviations. The experiments are numerous and suggestive. The illustrations are clear. The choice and arrangement of topics will not meet with universal approval. The number of laws and theories that are mentioned, and, in most instances, discussed, seems excessive for an elementary book that is intended chiefly for the use of high schools. After a brief account of oxygen, nitrogen, hydrogen

and carbon, follow descriptions of the manufacture of hydrochloric, hydrofluoric, nitric and sulphuric acids. The halogens and sulphur follow much later. Acids, bases, and salts are discussed in detail before any of the metals are studied.

The author justifies his method by pointing out the "enthusiastic interest" of his classes. Such evidence of its value should be criticised with caution.

The treatment of the metals is full and interesting. Two very brief chapters are given to organic chemistry, and an appendix contains the names of a few books of reference, lists of chemicals and apparatus, a few tables, and some directions for manipulation.

L. B. HALL.

HUMPHRY DAVY, POET AND PHILOSOPHER. BY T. E. THORPE, LL.D., F.R.S. The Century Science Series. New York: The Macmillan Co., Ltd. 1896. viii + 240 pp. Price \$1.25.

Professor Thorpe, of the Royal College of Science, London, is no novice in the writing of biographies of chemists; his "Essays in Historical Chemistry" (London, 1894) included sketches of Boyle, Priestley, Scheele, Cavendish, Lavoisier, Faraday, Graham, Wöhler, Dumas, Kopp, and Mendeléeff, and now chemists have to thank him for a very satisfactory biography of the illustrious Davy. The author had access to much original material not before used, private letters, and documents in possession of London scientific societies, notably the original records of Davy's experiments in the Royal Institution. The result is a more accurate work than that of Dr. Paris (1831) and less partial than that of Sir Humphry's brother John (1836). Professor Thorpe was fortunate in having a charming as well as distinguished personality for his subject, and he treats it very agreeably. He seems to have become inoculated somewhat with Davy's poetical nature for he writes of the "Pierian Spring," "Devotions to Calliope," the "Daring of Phaeton," and of "Priestley's Pegasus."

Davy's childhood and scanty education in youth are touched upon; he seems to have had no training in science, whatever, when he began work at Beddoes "Pneumatic Institution" in Bristol, but his industry and ability were inborn, and his discovery of "Laughing Gas" at the age of twenty-one started him on a career which reached a lofty height before he arrived at the age of thirty.