

THURSDAY, JULY 27, 1899.

INORGANIC CHEMISTRY.

Lehrbuch der Anorganischen Chemie. Von Prof. Dr. H. Erdmann. Pp. 728. (Brunswick: Vieweg und Sohn, 1898.)

THIS book is based upon the well-known work of Gorup-Besanez, the last edition of which was published in 1878, but it is practically a new book. It is printed in the style of Roscoe and Schorlemmer's treatise, handsomely illustrated, and well bound. In the 728 pages a vast amount of information is given about the facts of inorganic chemistry, and this information is in most respects well abreast of the time. The treatment and presentation of the subject are quite orthodox, except in so far as the description of experiments and of technical applications is separated from the main text, and printed in smaller type after the more general and descriptive account of a substance or group of substances has been written.

It is, perhaps, asking a good deal that a new book on inorganic chemistry should differ much except in size or price from contemporaneous works on the same subject. A perusal of the present work proceeds without any sense of freshness until the sections on helium and argon, where for the first time the personal authority of the writer is felt and approving interest excited. After this the even tenor is resumed until the second part of the work dealing with the metallic elements is reached. Here again interest is aroused, and the author may be congratulated on having produced a very readable account of what, scientifically speaking, is usually the duller part of a book on inorganic chemistry. The accounts of technical applications which are intercalated in the text are very well written, interesting, and trustworthy.

The chief question raised by this book is how far theory is to be introduced into a book on inorganic chemistry. Is a book on inorganic chemistry to be a compendium of facts, whilst the theory is to be sought in books on general or physical chemistry? As a matter of fact, books on inorganic chemistry written up to about 1870 included a discussion of all that was known of theoretical and physical chemistry. Till then the only important quantitative laws that were clearly established referred to composition, and accordingly the theoretical part of such books dealt mainly with the laws of chemical combination and the atomic and molecular theories. But things have advanced since then; we now know a great deal about chemical dynamics, and it seems anomalous that in such a book as the one under notice there should be no general exposition of the laws governing chemical reactions and chemical equilibrium. These laws, like the laws of composition, are fundamental, and the light they throw on every-day inorganic chemistry is indispensable for a right apprehension of the facts. There seems no good reason for neglecting them in a book of 700 pages dealing with inorganic chemistry.

The theoretical part of the book is also in other respects the least satisfactory feature. It displays much of the

anxious striving, to which some minds seem peculiarly liable, to be fundamental and logical on points where such exertion is quite unnecessary and unfruitful. An advanced student surely does not need to be carefully initiated into the difference between Roman and Arabic numerals, or the meaning of 10^6 , or the impossibility of putting a quart of liquid into a pint pot; yet these and like matters are gravely and lengthily expounded. The effect is to submerge the salient points of doctrine in a sea of tedious disquisition. One cannot but wish that the space so used had been saved for the discussion of such important theoretical matters as the constitution of ozone, the hydration of salts, the absorption of hydrogen by metals, the atomic weight of tellurium—topics to which justice is not done in the book.

There are some omissions and a few mistakes in the book. The account of flame includes the apparently ineradicable dogma that the hydrogen of a hydrocarbon burns preferentially to the carbon, and that solid particles of carbon are burnt up in the mantle. The rate of the explosive wave is confused with the velocity of inflammation, and the acetylene flame, which readily melts a platinum wire, is stated to be peculiarly cool. The blemishes in the book on matters of fact are, however, not many; the information is indeed, on the whole, admirable, and we have no doubt that Prof. Erdmann's work will on this account meet the requirements of a large class of students.

A. S.

MARINE BOILERS.

Marine Boilers. By L. E. Bertin; translated and edited by L. S. Robertson, with a preface by Sir William White, F.R.S. Pp. xxviii + 437. (London: John Murray, 1898.)

THIS is a translation, with some important alterations and additions, of M. Bertin's well-known work on marine boilers. M. Bertin, now Director of Naval Construction for the French Navy, was previously Principal of the *École d'application du Génie Maritime*, and his text-book was the outcome of the course of lectures on boiler construction which he delivered to the students of that institution.

The work has been translated by Mr. L. S. Robertson, an authority on the so-called water-tube boiler, and has the advantage of a graceful tribute to M. Bertin's skill as an engineer and naval architect in the form of a preface by Sir William White, Chief Constructor to the British Navy.

The book is copiously illustrated, but unfortunately the plates are sometimes by no means clear, and where dimensions are given it is often impossible to read them; as the illustrations are reproductions of those in the original French work, the dimensions are in metric units, while all the dimensions in the text have been converted into English units. Fewer illustrations, more clearly reproduced, would have been an improvement; though these remarks apply in the main to the general drawings only, the detail drawings being much clearer.

The author has divided the book into four parts, and has covered fairly completely the whole field. Part i. is devoted to the important subjects of combustion, trans-