

hand. Data of every degree of untrustworthiness are given in the text, but the student is debarred from verifying the figures or referring to the original for further information as to their meaning; exact references should have been given in every case. Even in the bibliography we would suggest that such citations as "Produktion and consum. of timbre in foreign countries. (blue book)," and "Statesman's yearbook, Statist. Abstracts (mit statistischen Tabellen)," are hardly clear.

Finally, while we approve the use of graphic methods, we wish that Dr. Reyer would lay to heart the golden instruction in the Board of Education's "Syllabus of Practical Mathematics":—"In all the work on squared paper a candidate should be made to understand that an exercise is not completed until the scales and the names of the plotted quantities are clearly indicated on the paper."

OUR BOOK SHELF.

Etude sur la Vallée Lorraine de la Meuse. By J. Vidal de la Blache. Pp. 190; with figures and folding maps. (Paris: Armand Colin, 1908.) Price 4 francs.

CAPTAIN VIDAL DE LA BLACHE publishes in this book a memoir on the development of the valley of the Meuse, a subject that has engaged the attention of several previous authors, including M. Cornet and Prof. W. M. Davis. He points out the striking character of this long valley, without any important tributaries, yet carved out in past times by a river more powerful than that which now occupies its bed. He explains its independence as regards the Paris basin by the fact that its waters were led northward into an old sea covering the Ardennes before the westward slope of the Seine system had been determined. The Meuse was originally joined by the Moselle at Pagny-sur-Meuse, through the now deserted gap between that town and Toul, and thus had its primary sources in the Vosges. The author relies much on the distribution of pebbles from the Vosges in the older alluvium of the valley. He denies that the river is decadent, though since the capture of the Moselle it has lost much of its erosive force; it has still an important flow, owing to the supplies gathered from the rains and stored in the deep and saturated gravels of its bed.

The second part of the book relates to the influence of the valley on the occupations of its inhabitants. The population has become reduced (p. 143) to the lowest level compatible with agricultural production, and labourers are even invited from other areas. Hence there is no surplus of workers who might emigrate from it to the neighbouring mining country. The latter has become occupied by Belgians and Italians, and the contrast of peoples and modes of living has become acute. The typical farmstead on the Meuse is figured on p. 151, where we see dwelling-house, barn, and stable under one great roof, as in Friesland; three separate entries, however, are here provided in place of the huge doorway common in the Low Countries. The history of roads along this natural highway or across it is fairly given, but the author stops short of the last great incident of the valley, when the French armies were led northward along it, as if drawn fatally to the Ardennes, while the Bavarians, representing the ancient torrents from the Vosges, poured down after them to Mouzon and Sedan. As Captain de la Blache ob-

serves (p. 177), the mineral wealth of Lorraine has led to a convergence of canals and railways independent of the direction of the Meuse; it is as if this valley "avait subi aussi une capture économique." G. A. J. C.

Chemical Reagents, their Purity and Tests. A New and Improved Text based on the Latest Edition of Krauch's "Die Prüfung der chemischen Reagentien auf Reinheit." By E. Merck. Translated by H. Schenck. Pp. vii+250. (London: A. Constable and Co., Ltd., 1907.) Price 6s. net.

EVERY chemist, whether engaged in analytical work or not, will welcome the translation of Krauch's manual into English, for the growing refinements introduced into all chemical operations render a full knowledge of the purity of laboratory reagents increasingly important.

In the present volume the properties of common materials, both inorganic and organic, are given in alphabetical order, the nature of the impurities indicated, and the tests, both qualitative and quantitative, described. It thus becomes a very simple matter to ascertain the purity of any substance, and, as there are something like 250 enumerated, it will be seen that the range is fairly comprehensive. There is little that calls for comment or criticism. The descriptions of the impurities and tests, though short, are usually sufficient for the purpose, not the least valuable part being the references to original papers containing details of the processes not found in the text.

The original of Krauch's manual appeared in German in 1888, and passed through several editions, the above translation being made from a revised edition prepared by E. Merck in 1905. The names of the joint authors are a sufficient guarantee of the trustworthiness of the information, and the translation is all that could be desired. Whilst strongly recommending the book we would direct attention to a few omissions. There is no mention of hydrazine, formaldehyde, toluene, or titanium salts, no quantitative method given for estimating solutions of hydrogen sulphide and ammonium sulphide, and nothing is said about metallic lead, magnesium, and aluminium, all of which may be regarded as not uncommon reagents. J. B. C.

Notre Flotte aérienne. By Wilfrid de Fonvielle and Georges Besançon. Pp. 234. (Paris: Gauthier-Villars, 1908.) Price 6.50 francs.

THIS little book forms a *résumé* of the steps taken to accomplish the navigation of the air so far as we have at present got. Ordinary ballooning is left out of the question, and the bulk of the book is devoted to the development of the dirigible, especially in France.

Soon after the ascent of the first balloon (1783), Lieutenant Meusnier wrote a memoir discussing the principles on which a dirigible balloon might be constructed. This was remarkable as foreshadowing the airship of to-day, especially as regards the "ballonet," or method by which the envelope can be kept rigid by the internal pressure of air. But at that period no engines existed by which the necessary power for propulsion could be obtained. Later on, when the steam engine had become developed, Giffard built his machine, the prototype of the modern vessel, and made trials in Paris in 1852. Little by little further improvements were made, the siege of Paris especially directing attention to the importance which might attach to such an apparatus in military operations.

Then came the electrically propelled balloons of M. Tissandier, and *La France*, which latter proved to be the first machine to make long journeys successfully.