

THURSDAY, MARCH 6, 1884

## RECENT TEXT-BOOKS ON TECHNOLOGY

1. *Steel and Iron*. By William Henry Greenwood. (London : Cassell and Co., 1884.)
2. *Bleaching, Dyeing, and Calico Printing*. Edited by John Gardner. (London : Churchills, 1884.)
3. *The Art of Soap-Making*. By Alex. Watt. (London : Crosby Lockwood and Co., 1884.)

ALTHOUGH the comprehensive system of technological examinations established under the direction of the City and Guilds of London Institute has been at work only a comparatively short time, it has already called into existence a considerable number of manuals and text-books designed to meet the special requirements of teachers and students in connection with those examinations. No doubt excellent works in certain branches of technology already exist, but many of these are scarcely suited to the purpose of the teacher, and most of them are in price beyond the means of the class which the Institute seeks to benefit. The action of many of our leading publishing houses in thus vying with each other in the production of series of low-priced handbooks of technology to meet a demand primarily created by the policy of the Institute is calculated not only to serve the interests of those preparing for examinations but also to react beneficently upon the general intelligence of our workmen. Numbers of these smaller works find their way into the hands of the better class of our mechanics, foremen, and apprentices, to whom the larger and more elaborate works, even when present in our free libraries, are as sealed books. On the whole, it may be said that the handbooks which have already appeared have been prepared with a rational appreciation of the needs of intelligent practical men. The majority of them are written or compiled by specialists, or by men who are well acquainted with the industries to which their works relate, and their descriptions and statements are made with the authority and discrimination which result from a practical knowledge of the manufactures of which they treat. The first and third of the works before us are excellent illustrations of this fact. In Mr. Greenwood's manual we have not only a comprehensive account of the present condition of our iron and steel manufacture, full of sound, practical information, but a very clear and accurate exposition of the scientific principles upon which the manufacture depends. The information is fully up to date ; the illustrations are not mere pictures, but diagrams based upon original drawings, the majority of which have been reduced from scale plans of existing plant, and so arranged as to be readily understood by those who have only a slight experience of mechanical drawings. The chemical portion of the work makes no pretensions to be exhaustive, but it is accurate and sufficiently full. On p. 63, however, we notice that the composition of spiegeleisen is represented by the formula  $\text{FeMn}_4\text{C}$ , probably a misprint for  $(\text{FeMn})_4\text{C}$ , although the evidence in support of the existence of any such definite carbide is very weak. A characteristic feature of the work is seen in the prominence given to

such Continental processes as may possibly react upon English methods, as for example the Perrot revolving puddling furnace, and the various reheating furnaces of Bicheroux, Casson, and Ponsard. The chapters on steel are remarkably concise and complete. The author meets the well-known difficulty of definition by assuming that any compound of iron and carbon which is delivered from a vessel in a state of fusion and at once cast into malleable ingots may be considered as steel. This definition is perhaps not very rational or precise ; it seeks to exclude cast iron on the ground of its immalleability, and wrought iron from the circumstance that in practice it is never obtained wholly fused ; however, it is at least more accurate than that based upon the quality of hardening and tempering, which the so-called mild steels do not possess to any sensible extent.

The volume on "Bleaching, Dyeing, and Calico Printing" is a production of a very different character. It has not the slightest claim to originality, but is mainly a compilation, of some 200 pages, from the standard works of Crookes, Stenhouse, and Groves and Ure, and consists very largely of receipts and formulæ. The chapter on bleaching is fairly well done, especially the portion relating to linen bleaching ; and the section on mordants is good so far as it goes. What there is of chemistry in the book is generally accurate, but the author would in nowise have diminished the air of practicality about his work if he had removed or replaced some of the barbarisms in chemical nomenclature affected by dyers. It is quite possible to be precise without being pedantic. The book is poorly illustrated and somewhat loosely put together.

Mr. Watt's book on "Soap-Making" is a thoroughly practical treatise on an art which has almost no literature in our language. The author is the son of the late Mr. Chas. Watt, the inventor of the well-known process of bleaching palm-oil for soap-makers, and he has been connected with that industry for many years. Soap seems to have been made in England only since the middle of the seventeenth century, but the manufacture made very little progress until the invention of the Leblanc process for converting common salt into carbonate of soda. The art received its second great impetus from the labours of the venerable Chevreul in the early part of this century, who, with Liebig, elucidated the theoretical principles upon which the manufacture depends. Mr. Watt's book shows what influence these researches have had upon the development of the art, not only directly, but as demonstrating to the soap manufacturer the importance of a knowledge of chemistry in its applications to his processes. The general theory of saponification is first explained, and is followed by a chapter on the arrangement of a soap factory and a description of the materials used in soap-making. The various methods of making hard soaps and cheapened soaps are then fully described, both by the old processes and by those of Hawes and Bennett and Gibbs, Rogers, and Berghart. The processes for manufacturing potash soaps and soaps for printed goods and silks are next explained, and there are special chapters on toilet and medicated soaps, alkalimetry and the methods of soap-analysis, and on the recovery of glycerine from spent lyes. We congratulate Mr. Watt on the success of his endeavour to fill a void in English technical literature.

T. E. THORPE