

The subject-matter is dealt with under the following heads:—General properties of matter; moulding sands; facing sands; foundry tools; moulding-boxes; handling material in the foundry; open sand moulding; cores; elementary aspects of moulding; green-sand moulding; securing cores in moulds; moulding from guides; bench, outside, and plate moulding; machine moulding; dry sand moulding; loam moulding; chill casting; casting on to other metals; weighing and binding moulds; shrinkage, contraction, and warping; dressing castings; common faults due to mould and pattern; wrought iron; cast iron; refractory materials; fuels and furnaces; mixing by analysis; further treatment of cast iron; high-temperature measurement; steel; metals other than iron; alloys; mechanical testing; micrographic analysis; common faults due to the metal; and foundry management. The illustrations, of which there are 246, have been carefully chosen, and, like the letterpress, are exceptionally well printed. From this enumeration of the contents it will be seen that, although bearing the comprehensive title of "General Foundry Practice," the work is almost entirely devoted to iron and steel founding. Metals other than iron are disposed of in some twenty pages, brass founding receiving chief attention. The ingenious *cire perdue* process of bronze casting is not mentioned, nor is the modern method of casting in sections bronze statuary of heroic size, such as Bartholdi's "Liberty" at New York and Schwantaler's "Bavaria" at Munich. The plaster moulds used for this purpose might have been added to the green sand, dry sand, loam, and chilled moulds described by the authors. A few lines, too, might have been devoted to the moulds used for metals with low melting points, brass, slate (for toy soldiers), wood, and even paper (for stereotype plates) being employed.

As the eye of the metallurgist wanders up and down the authors' well-filled pages, it will be arrested by that section which deals with the influence of the various impurities in cast iron. Phosphorus, it is shown, increases the fluidity of cast iron and renders the metal suitable for art castings, such as those for which the Russian works at Kyschtym are famous. Sulphur tends to make castings harder and brittle. Silicon, by tending to throw the carbon out of the combined form and to make it appear in the metal as graphite, has a beneficent influence. Manganese, on the other hand, has a tendency to keep the carbon in the combined form. These facts have to be borne in mind in mixing by analysis, a method which, it is gratifying to find, is steadily replacing mixing by fracture, by guesswork, or by trial. As the underlying science of the founder's art becomes more and more clear, well-marshalled knowledge is increasingly helpful. As the authors point out, the real theoretical knowledge of the man of science is built on experiment, and his theories are tested by further experiment. The practical man constantly meets with difficulties in his work; and he also must, in a truly scientific way, devise a remedy by testing the results of his

former experience. The apparatus may be cruder than that of the laboratory, but it will be used with a subtle judgment of the needs of the case. The man who combines a scientific training with practical experience is gradually, but surely, becoming the dominant type of industrial captain in the best equipped foundries.

The book is unusually free from typographical and other errors, and there is little in the arrangement of the material to which exception can be taken. It might perhaps have been well to have carried the subject a stage further, and to have given the student some information regarding the galvanising, nickel-plating, lacquering, and porcelain enamelling of castings, and regarding the repairing of faulty castings by melting in iron by means of the electric arc or the oxyhydrogen blow-pipe. Pattern making is altogether ignored. It is true that it is a distinct trade involving the skill of the joiner and the turner. A practical founder should nevertheless have a general knowledge of the construction of foundry patterns; and the elaborate patterns, sharply chased in a tin-lead alloy, used for ornamental castings present many features of interest to the foundry managers and foremen for whom the work is primarily intended.

OUR BOOK SHELF.

Eversley Gardens and Others. By Miss R. G. Kingsley. Pp. x+280. (London: George Allen, 1907.) Price 6s. net.

It is always stimulating to meet with enthusiasm, and Miss Kingsley is not only an enthusiast with regard to individual plants, but possesses a keen eye for their artistic setting and arrangement. Eversley is situated on the Bagshot beds in a part of Hampshire that has received the *sobriquet* of "the rubbish-heap of the world"; and as much of Miss Kingsley's experience was gained in laying out and cultivating the garden of Keys House, in Eversley, her success may serve as a help to other amateurs whose energies are also concentrated on poor soil.

It would appear that roses have been Miss Kingsley's chief delight, especially the teas, hybrid teas, and climbers. She presents a lengthy choice, arranged in colour groups, containing besides such universal favourites as G. Narbonnand, Frau Karl Druschki, and Caroline Testout, others less generally known, as Madame Ravary, Coquette de Lyon, and Monsieur Trillier. The list of rhododendrons, a plant that finds a congenial home on the Bagshot soil, is especially noteworthy, and the plan of growing bulbs in peat fibre in bowls is recommended as a clean and rapid method for producing fine flowers. While it is probable that most gardeners will find many hints and references to species unknown to them, it is certain that all can learn much from the artistic combinations described by the author, some produced in her own garden, others in her friends' gardens.

The Friendly Stars. By Martha Evans Martin. With introductory note by Prof. Harold Jacoby. Pp. ix+253; illustrated. (London and New York: Harper and Brothers, 1907.) Price 5s. net.

EVIDENTLY written by one who for years has been in the habit of looking upon the stars as companions, rather than as conglomerations of known and unknown elements, this volume will appeal to the