

possible of it; but he has a great deal more to say to him who desires a higher and better knowledge. He forgets how profoundly we are taught that matter is divided into common and rare elements. He keeps before him the necessity of giving to all forms of matter the same kind and quantity of study. Realizing that most rare elements are rare in quantity only, and that their distribution is indeed wide, he has given us the only English-written book to which workers in chemical and metallurgical technology can, under all circumstances, refer: workers whose necessities require that they shall be as familiar with many rare elements as they are with iron and with oxygen.

The great majority of American chemists regard Prof. Crookes as an honest and earnest and most consummate analyst. The small remainder, which does not so consider him, consists of those who do not know his work. One consults him with the comfortable feeling that his statements already are verified, that they have come out of his laboratory note-book, and that if possibly he should not give the solution of the problem in hand, he quite surely will teach enough to make the remainder apparent.

In the preface to this third edition, the author states that he desires the volume to be regarded chiefly as a collection of novel or little-known processes which have been found to be successful. He has not set himself the task of printing again that which may be found abundantly in special literature; except, that he has felt impelled to give to the world a series of electrical separations and processes. After a critical examination of the volume, the reader will emerge with a consciousness that the author kept to his assigned task and that his work was well done.

WILLIAM GLENN.

BALTIMORE CHROME WORKS,
October, 1894.

A CHEMICAL AND METALLURGICAL HANDBOOK. BY J. H. CREMER, M.E.,
and G. A. BICKNELL, B.Sc. pp. 280. Cleveland, Ohio: J. B. Savage.
Price, \$2.50.

This book contains 280 pages of information chiefly in notes and tables, which is of especial importance to iron chemists and metallurgists, and which any practical chemist or metallurgist

needs in a form convenient for reference. The extended and successful experience of the authors in the chemistry and metallurgy of iron is an assurance of reliability.

In the tables of logarithms and reciprocals, factors and logarithms for the calculation of analytical results, the specific gravity of solutions, and in the table giving the molecular weights, specific gravity, melting-points, boiling-points, and solubility of the principal inorganic compounds, chemists will find much useful information. The tables for the analysis of iron ores facilitate the calculation of phosphorus, silicon, and sulphur. Moisture tables are inserted for the calculation of the percentage of iron, silicon, manganese, and other constituents in the ore in its natural condition from analysis of the dried ore. As an example of the careful effort expended in the preparation of this book, the phosphorus table gives the percentage of phosphorus in pig-iron, from the percentage of phosphorus and the percentage of iron in the ore, for a difference of 0.001 per cent. from 0.001 per cent. up to 0.100 per cent. Other data include a table of fractional parts of numbers in tenths from one to eighteen for the calculation of phosphorus and silicon in an ore burden, and a table which gives the cost per unit of iron from the price and analysis of the ore in differences of one-half per cent., or iron from forty to seventy per cent.

For the convenience of metallurgists and prospectors in the field, a brief outline of the principal geological formations is included. The principal minerals are given with their chemical composition and physical properties. Other tables contain the amounts of limestone required to produce slags of different composition, the quantity of slag produced, and numerous other data that every blast-furnace manager must have constantly at hand. Brief notes on the properties and mutual relations of carbon, silicon, sulphur, phosphorus, and manganese in blast-furnace practice, contain much useful information. The book is well printed and neatly bound.

CHARLES F. MABERY.