

numbers correspond, are explained. Paragraphs on hygrometers and their uses, the control of temperature in drying chambers, methods of determining soluble salts in clays for the prevention of efflorescence in the finished products, for the water capacity of clays, for their examination for uniformity by elutriation, for the determination of voids or volume weight, and their binding properties follow. Tests for the amount of solid glazing material necessary in glazing, for determining the crushing strength of the finished products, their loss from attrition and their resistance to impact and weathering are noted. The use of the Deville furnace for testing the fire-resisting quality of clays and the determination of their shrinkage or contraction in burning is described. The apparatus for all these determinations or tests and for the control of the burning processes are furnished by the laboratory of the editors. Much of it could no doubt be introduced into the clay-working industries of the United States with success.

The remainder of the contents of the second part of the calendar is of purely local interest in Germany, unless it be a list of books, 475 in number, relating to the various industries in which clay is employed, which are sold by Seger and Cramer, 6 Kruppstrasse, Berlin, N. W. 5.

To all engaged in the clay industries, especially the production of brick and terra cotta, who have a knowledge of the German language, the calendar will be found to be, at least, suggestive, although largely an advertisement of the wares of Seger and Cramer.

CLIFFORD RICHARDSON.

LEAD SMELTING: THE CONSTRUCTION, EQUIPMENT, AND OPERATION OF LEAD BLAST-FURNACES, AND OBSERVATIONS ON THE INFLUENCE OF METALLIC ELEMENTS ON SLAGS, AND THE SCIENTIFIC HANDLING OF SMOKE. BY MALVERN WELLS ILES, PH.D., some time Assistant Instructor Qualitative Laboratory, School of Mines, Columbia University; Chemical Fellow, Johns Hopkins University; Assayer and Chemist, Grant Smelting Works, Leadville, Colo.; Metallurgist, Omaha and Grant Smelting Works, Denver, Colo.; also Holden Smelting Co., Denver, Colo.; Superintendent Globe Smelting and Refining Co., Denver, Colo. John Wiley and Sons. 1902. 228 pp.

This book, in which the author has recorded the experience of many years of actual contact with smelting operations, is a very complete discourse on the subject told in a conversational style without any attempt at literary embellishment, and the student

will find here what he wants to know: how to carry into practice the principles he may have received elsewhere.

Owing to the manner of presentation there is more or less repetition, but perhaps this is advantageous rather than otherwise, inasmuch as this occurs while considering different phases of the subject.

After a general discussion of the blast-furnace and its management, suggestions as to drawings and specifications are given, including a full discussion of the inner lines of the furnace. This part of the work is fully illustrated, and dimensions are given, also a historical sketch of the changes which have taken place from time to time; this is followed by details of the foundation, the crucible, the water-jackets and the superstructure.

The power plant is fully discussed, and the equipment of the plant with tools and implements is treated in much and valuable detail.

After some suggestions as to "blowing in," the calculation of charges is dealt with, followed by suggestions as to the general supervision and operation of the plant. Fifteen pages are devoted to wall accretions and influence of metallic elements. The results of the smelting operations, the composition of slags, bullion, etc., and the production of antimonial lead is fully dealt with; there is also a short chapter on roasting furnaces. The balance of the book, some sixty pages, is taken up with a discussion of "smoke" in which "the aim has been to show how the stupendous values heretofore lost in smoke can be saved by filtering through cloth." The author strongly advocates this use of cloth for collecting fumes.

Any student aspiring to the management of a smelter, particularly a lead smelter, should study this book. It will prove helpful to all who desire some knowledge of this branch of metallurgy.

WM. HOSKINS.