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BOOK REVIEWS.

Mechanical Technology. By Prof. G. F. Charnock, M.I.C.E., M.I.M.E. Published by Constable & Company, London. 635 pages; 503 illustrations; 6 x 9 ins.; cloth. Price, \$2.00, (Reviewed by A. J. MacDougall, mechanical engineer, Toronto Power Co.)

This book deals principally with the mechanical processes in refining and preparing metals for use in the arts. The chemical and thermochemical changes, however, are not taken up. The book is divided into three parts: the production and properties of materials of construction, the processes depending on fusion, and the processes depending on ductility.

The beginning of the first part is given up to the physical properties of materials—tenacity, elasticity, hardness, toughness, malleability and ductility.

There is an error at the beginning of this chapter. The statement is made on page 4 that water has the greatest specific heat of any known substance. The specific heat of liquid hydrogen is six times and of gaseous hydrogen 3.4 times that of water.

In Chapter 3 there is described the smelting of iron from its ores in blast furnaces. The accessories are given the hot blast stoves, blowing engines, hoisting skips and air gas mains. The properties of pig iron are stated in Chapter 4. Then follow in order, with plans and illustrations, to Chapter 10, the production of wrought iron, classification of steel, the manufacture of steel by the crucible, the Bessemer, the open-hearth, and the electro-thermic processes.

The author then takes up in a scientific manner a subject in which there have been great advances in the last few years—alloys and the heat treatment of steel. Credit is given to the late Sir W. C. Roberts Austen for the discovery of physical changes in formation of alloys at various temperatures and the practical heat treatments developed therefrom. Non-ferrous metals and the methods of refining are briefly described in Chapter 13. The metals described are copper, tin, zinc, lead, aluminum, antimony and nickel. Their alloys are given in Chapters 14, 15 and 16. In Chapters 17 and 18 are given the properties and uses of timber and building stones. These chapters describe timbers and building stones in use in Great Britain and therefore lack in value for Canadian conditions.

The author describes in Chapter 19 oils and lubricants, their properties and specifications for various uses. He has neglected to give any statement about the effect of an

emulsifying oil and a test of the oil for emulsification.

Leather, rubber and cotton and their use as belting with methods of manufacture are given in Chapter 20.

Part II., comprising Chapters 21 to 30, takes up the moulding of fused metals. Starting with advice as to design and form of patterns to avoid defects in castings, the author proceeds to describe methods of moulding and then gives advice as to the foundry and its equipment, devotes a chapter to steel casting, and finishes this part of the book with defects in castings and machine moulding.

In Part III., Chapter 30 to the end of the book, there are taken up forging and working metals, ductile, plastic, and malleable, at ordinary or high temperatures. After describing the tools and machines required in forge and smithy the author gives in Chapter 30 a classification of operations in forging, and illustrates with examples, and then devotes a chapter to each to describe manufacturing processes, utilizing the ductility of metals. The processes are drop forging, wire drawing, flanging, coining, the rolling mill, and the manufacture of tubes.

All the machines and processes in this book are well described, and the book is valuable to the foundry man and to the smith, to those who have to do with fused or forged metals. But the book might be even more valuable. One would like to know the following about a machine to make any product: the general design of the machine, the process to make the product, the cost of the machine, the power, and the labor required to operate the machine. The cost, power, and labor are neglected in this book and the book lacks in value to that extent.

American Sewerage Practice, Vol. 3—Disposal of Sewage.

By Leonard Metcalf and Harrison P. Eddy. Published by McGraw-Hill Book Co., New York City. First edition, 1915. 851 pages; 230 illustrations; 205 tables; 6 x 9 ins.; cloth. Price, \$6.00.

This is the third and final volume of an exhaustive treatment of the subject of sewerage practice. Reviews of the previously published volumes, 1 and 2, relating respectively to the design and construction of sewers, have already appeared in these pages. As in the previous instances, the book under consideration is non-technical in nature, but deals in a comprehensive way with sewage and the changes which it undergoes when subjected to different conditions. The book is undoubtedly intended primarily for engineers connected with the design and operation of sewage disposal plants, but it will be found of great value by civil engineering students, sewerage boards, public health officers and corporation lawyers.

The first six chapters have to do with sewage itself. The progressive steps in sewage treatment are reviewed in Chap. 1. Significance of chemical analyses is considered in Chap. 2; bacteria and their relation to the problem of sewage disposal, Chap. 3; microscopic organisms, Chap. 4; composition of sewage, Chap. 5; theories of sewage disposal and treatment, Chap. 6.

The remaining fourteen chapters deal with subjects of particular interest to designing engineers and operators