Book Reviews

The heating of steel. M. H. Mawhinney. New York: Reinhold, 1945. Pp. viii + 265. (Illustrated.) $4.75.

This book treats the heating of steel in an interesting and thorough manner and brings the reader up to date on the technological progress made in this important field during the past 20 years. An outstanding chapter covers the chemical effects of heating steel and includes an excellent review of the present status of atmosphere control. Other chapters relate to fuels and burner equipment, temperature distribution and furnace control, heat transfer and fuel economy, the quenching of steel, alloys and refractories, and steel mill furnaces.

Among those who will find this book of practical value are steel engineers and metallurgists, operating and maintenance personnel, combustion engineers, and furnace designers, as well as research and development engineers interested in steel-heating problems.

The author predicts that the future trend in fuel technology as applied to industrial heating furnaces will probably be toward application of the cheaper fuels to large heating furnaces for temperatures above 2,000° F. For intermediate temperatures (about 1,800° to 2,000° F.) fuel oil and coke-oven gas—the latter used directly, as in the steel mills, or mixed with other gases as supplied by utilities—will probably compete on a straight price basis with the clean gases, such as natural gas, artificial gas, and butane. At still lower temperatures the author states that convection heating is the most logical method for heat transfer.

While the emphasis throughout is on fuel-fired furnaces, attention is given to salt-bath furnaces, electrical resistance heating furnaces, and induction heating. With respect to the last two items it would appear that a more complete treatment would have been well justified.

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Handbook of nonferrous metallurgy. Pt. II: ***Recovery of the metals.*** (2nd ed.) Donald M. Liddell. (Ed.) New York: McGraw-Hill, 1945. Pp. xi + 721. $7.00.

The second volume of the new edition of the *Handbook of nonferrous metallurgy* deals with the applications of the principles and processes, described in the first volume, to the particular problems arising in the extraction of metals from their ores. This separation of the subject into two parts, one dealing with principles and the other with their application, is an excellent method of presentation. Since publication of the first edition in 1926 this has been one of the best reference works in the field of nonferrous metallurgy. The revised edition, written during the war, has not, in the opinion of this reviewer, done justice to the excellent reputation of the first edition. Undoubtedly the contributors to this volume could not afford to take the necessary time from their essential war activities to make this edition as complete as they wished. Also, they were compelled to omit certain new processes for reasons of military secrecy.

The book contains separate chapters on the principal methods of recovery used for the more important nonferrous metals (copper, lead, zinc, aluminum, magnesium, gold, and silver). The other metals are grouped into several chapters according to their importance and the type of recovery employed. Each chapter is written by a person (or persons) familiar with the particular process involved. This has some advantages, but leads to much nonuniformity in presentation. For example, considerable information is given on the physical and mechanical properties of aluminum and magnesium alloys, while no such information for copper alloys is presented. There is very little information about the production economics of the important metals, although a summary of such information is given for antimony and for tin. The authors of some chapters go into the methods of chemical analysis in great detail, while no methods of analysis are given for some other metals. The bibliographies of some chapters have been brought up to date, while for other chapters the bibliographies are the same as those in the 1926 edition or are omitted entirely. This lack of consideration for the contributors of valuable articles appearing in recent years is unpardonable. In some cases the references are incomplete, the author and date being omitted. In many chapters, undue attention is given to elementary and irrelevant topics, while the treatment of the actual metallurgical operations is inadequate. An example is a long discussion of blast-furnace copper smelting, now almost obsolete, with only a very brief mention of magnesite brick, suspended-arch construction of reverberatory roofs—one of the most important recent advances in copper smelting. The importance of scrap as a source of the metals is underemphasized or completely neglected. Many of the illustrations are so poorly chosen that they defeat their purpose, and there has been no attempt at uniformity in the presentation of flow sheets and diagrams.

The chapter on antimony is well written, but its length is out of proportion to the relative importance of the metal.

For the most part, the book does not indicate the progress, although slight in many cases, which has taken place in nonferrous metallurgy in the last 20 years. In the opinion of this reviewer, the book was assembled too quickly and was very poorly edited. It will be of limited value to students, engineers, or teachers.

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