knowledge on the part of the reader, it presupposes that he has a not inconsiderable acquaintance with the facts and laws of physical chemistry. To those up in this particular the book will be of service from its unity of arrangement and broadness of treatment. C. E. LINEBARGER.

ELECTRIC SMELTING AND REFINING, BEING THE SECOND EDITION OF ELECTRO-METALLURGIE. By DR. W. BORCHERS, translated, with additions, by WALTER G. MCMILLAN. London: Charles Griffin & Co., Ltd.; Philadelphia: J. B. Lippincott Co. 1897. xx + 416 pp. Price $6.50.

This book treats of the extraction and refining of metals by the electric current and includes the electrolysis of aqueous solutions as well as electric smelting proper, but not electrolytic analysis, electroplating, or electrotyping. The introduction describes concisely the modern theory of migration of ions, with references to larger works, the translator adding some wise remarks upon the cost of electrometallurgical works. Additions by the translator supplement and broaden the work of the author throughout the book.

The following metals are treated: Magnesium, lithium, beryllium, sodium, potassium, calcium, strontium, barium, aluminum, cerium, lanthanum, didymium, copper, silver, gold, zinc, cadmium, mercury, tin, lead, bismuth, antimony, chromium, molybdenum, tungsten, uranium, manganese, iron, nickel, cobalt, and the platinum group. In considering each metal there is a good description of the properties of the metal, its natural occurrence, and, for comparison, a brief description of the ordinary methods of its extraction. Then follows a description of the attempts to use the current in the production and manipulation of the metal.

In general this history is remarkably full and complete, but with a few notable exceptions. Much purely experimental work is described, together with many impracticable propositions. The record of these, however, is valuable, particularly for shaping future investigations. The author quotes freely from original sources, with abundant references, and discusses the important propositions. He adds many valuable points from his own extensive and ingenious experience. He forgets, however, like a vast majority of people, that a patent is a crea-

ture of law and discusses patents without due regard to the patent laws of various countries. He often treats a patent too seriously.

A chapter is devoted to the carbides of the alkaline earth metals, but no mention is made of carbide of silicon, carborundum.

The author considers it impracticable to extract the common metals directly from their ores, by the current. They must first be smelted by ordinary means to crude metal to be refined by the current or else they must be leached and the solutions electrolyzed, with regeneration of the solutions for reuse, or utilizing the anode reactions for producing useful products.

While promising processes are being developed the commercial condition of the art is briefly this: No metal, with the possible exception of sodium in alloys and magnesium, is produced directly from native ores by the current. Only two important metals, sodium and aluminum, are produced by electric smelting proper. Silver, and incidentally gold, and vast quantities of crude copper are electrolytically refined. A few processes are applicable under special conditions.

Although this book is essentially German in its conception and execution, it must prove of great value to workers in the field. It is profusely illustrated, has a full table of contents and a good index. FREDERIC P. DEWEY.

THE BOOK OF THE DAIRY. TRANSLATED BY C. M. AIKMAN AND R. P. WRIGHT from the German work of W. FLEISCHMANN. London and New York; D. Van Nostrand Co. xxiv + 344 pp. Price $4.00.

This work is a translation of the first edition of Dr. Fleischmann's "Lehrbuch der Milchwirtschaft." Since the translators have completed their work, a second and improved German edition has been published. The translated edition does not include the important dairy work of the last six or seven years. This seriously impairs the usefulness of the book; as an example, the probabilities regarding the variations in the size of the fat globule are considered, while no reference is made to the recent work relating to this topic. Some of the old methods for testing milk as Marchand's butyrometer should have been replaced by more reliable and modern ones as Babcock's or Gerber's centrifugal method; then there would have been no necessity to have said, "It is to be hoped that a reliable method of deter-