was to enable the workman to compensate for deficiency of knowledge of scientific laws by means of "rule-of-thumb" experience and by remembrance of a multitude of empirical instructions. In order therefore to enable the artisan reader to make the best use of the book, we would recommend him to previously learn sufficient of the principles of chemistry and of voltaic and electrolytic action, and then master the very numerous practical details of this book.

Repetitions of small matters are frequent in the book; in more than twenty instances the same statement has been made in modified forms, from two to four times. These repetitions are most frequent in the chapters on deposition of nickel.

In consequence of the considerable redundancies, the large amount of extraneous matter, the excess of details of manipulation, and the repetitions, a large quantity of matter might have been omitted, and the contents of the book would have been rendered more in accordance with the title. According to the present contents, a more appropriate title would have been "Manipulations in Electro-deposition," &c.

The writer of the book makes the following statement on p. 213; speaking of "cheap jewellery" he says: "The author has found it a very convenient plan to use a *copper* anode for gilding work of this description, and by making small additions of chloride of gold when the bath exhibited signs of weakness, he has been able to gild a very large number of articles of a very fine colour, with an infinitesimal amount of the precious metal. In his experience, although the prices were very low, the result was exceedingly profitable. Against the employment of a copper anode it has been argued that the solution must of necessity become highly impregnated with copper, to which we may reply that we did not find such to be the case in practice." The circumstance he mentions—that the solution "did not become highly impregnated with copper" is easily and correctly explained: the solution did become charged with copper, but not "highly," because the copper was deposited as fast as it was dissolved in alloy with gold upon the articles, and thus produced the "very fine colour," and conduced to the "exceedingly profitable" character of the result. A complete proof of this is afforded by the author on p. 197 of his book, in his instructions for depositing alloys of gold.

On p. 214 he very truly remarks: "The introduction of the electro-gilding art greatly favoured such unscrupulous persons as desired to prey upon the public by selling as gold, electro-gilt articles which had not a fraction of the precious metal in their composition." As an example of this he mentions "mystery-gold," and states that "the chief aim of the manufacturers" of articles made of that composition "is to defraud pawnbrokers."

In Chapters XXIX., XXX., and XXXI., on "Electro-metallurgy," the author has copied and collected together, from Fontaine and Berly's books on "Electrolysis," and various periodicals, &c., nearly all the information yet published respecting the electrolytic refining of crude copper, lead, zinc, &c., on the commercial scale, and the economic extraction of metals from minerals by the aid of electrolysis. Six pages of those chapters are devoted to a description, with drawings, of Cowle's electric furnace. But this furnace is not "electrolytic": it is one in which an intense heat is obtained by means of the electric arc on a large scale in an inclosed fire-resisting chamber, in which carbon at an enormous temperature reduces aluminium and silicon from their oxides, and those reduced elements form alloys with copper previously mixed with the carbon. Much of the information contained in these chapters is useful, but a large portion of it relates to new processes, and partly unsuccessful experiments on a large scale; and as some of those processes are imperfect and in a state of development, the statements made respecting them should be received with caution.

In consequence of the serious deficiency of information respecting the chemical, voltaic, and electrolytic principles of the subject, we do not consider that the author has succeeded in his aim "to treat the more scientific portion of the work in such a manner that those who are not deeply versed in science may readily comprehend the chemical and electrical principles of electrolysis." But notwithstanding the fundamental and minor defects which we have pointed out, as the details of workshop information and manipulation contained in the book are so copious and complete, we think he has substantially attained his "desire to furnish a comprehensive treatise embodying all the practical processes and improvements in the art of electro-deposition"; and, irrespective of its shortcomings, the book will prove of great value to many electro-depositors, jewellers, and various other workers in metal.

OUR BOOK SHELF

"Weatherology" and the Use of Weather Charts. By Campbell M. Hepworth, R.N.R. (London: Laurie, 1886.)

METEOROLOGISTS must wish success to this endeavour of Capt. Hepworth's to popularise their technical phraseology, and to explain how the public can utilise the weather-charts which appear daily in the *Times* and *Lloyd's List*, in combination with local observations of wind, sky, and weather. The author has considerable sea experience in the North and South Atlantic, and he imparts the results of it freely, but his language is still rather too scientific for an ordinary reader.

Without being hypercritical, we must take exception to two statements. The definition of a "gradient" is defective, for no mention is made of the unit of barometrical difference (0·01 inch), which is employed, while the modern unit of distance is 15 miles, not 60.

Again we must protest against fathering on Admiral FitzRoy (p. 5) the form of siphon barometer which is sold for a guinea, and sometimes is called after him, sometimes dubbed the "Polytechnic barometer." There is no authority to connect the Admiral with it, as either inventing or even approving of it. ROBERT H. SCOTT

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Residual Magnetism in Diamagnetic Substances

IN the account which Prof. Lodge gives of his very interesting experiments (NATURE, March 25, p. 484) he describes an