

A series of practical tests in various sections shows that it is easy to trace at once the information sought; and to this end a system has been adopted in which rigidity has been tempered very wisely. There are chapters in Part II. which one might have expected to be placed near others in Part I.; for example, thermochemistry is separated from thermodynamics in this way, and cryoscopy from vapour pressures; but some change in the sequence of sections may doubtless be made hereafter, and in the meanwhile there is no obstacle to utility. The printing is clear; and with the tabulated data the compilers give sufficient indication of the experimental method used, mention any general formulæ found applicable by the author, and state the conditions quite unambiguously. The use of graphs instead of tables in dealing with subjects such, for example, as absorption-spectra, equilibrium mixtures of metals, or the ignition of gaseous mixtures, is well carried out. In chapters treating of organic compounds Richter's classification is used; and it is clear that the vexed question as to the organic or inorganic nature of calcium carbide would present no difficulty to the editor, for he provides the useful category of "Corps mixtes." This name, however, although no doubt correct in French, should certainly not be rendered in English as "mixtures." The misspellings of English authors' names are probably not more frequent than can be matched in English references to foreign literature.

Dr. Marie prints his regrets that this volume, covering 1913-1916, is only now issued; but, as in the case of Dr. Johnson's dog, the marvel is, not that it is done so well, but that it is done at all; for the difficulties during and just after the War must have been very great. That these difficulties have been passed, so that we have Volume IV., are informed of an accelerated issue of Volume V. (1917-1921), and may look for a regular progression thereafter, is a real achievement in advancing research.

I. M.

Our Bookshelf.

Modern Tunneling. By David W. Brunton and John A. Davis. (New Chapters on Railroad Tunneling, by J. Vipond Davies.) Second edition, revised and enlarged. Pp. x+612. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1922.) 33s. net.

THE first edition of this work was published in 1914, and its contents were limited to mine and water-supply tunnels. The present edition has been revised and enlarged by Mr. John Vipond Davies, and contains new matter dealing with large-sized tunnels. The early part of the volume contains a very good discussion on the plant required in the construction of tunnels, and includes such subjects as the factors influencing the choice of prime movers, types of air compressors, surface

plant generally, and methods of ventilation. This is followed by critical descriptions of the various underground appliances, such as rock-drilling machines, the methods of blasting, haulage, etc. The great development of tunnels during the last fifty years has been due to the application of high explosives and rock-drills, and this part of the subject receives adequate treatment. Details of the cost of a large number of tunnels are included, together with the speeds attained in driving them. There are two comprehensive bibliographies, and these may be regarded as an essential feature in a book on this subject and of moderate dimensions. The matter is presented in a very readable manner, and the volume will be of service not only to the engineer engaged in practice but also to the student of civil engineering.

La Force motrice électrique dans l'Industrie. Par Eugène Marec. Pp. viii+613. (Paris: Gauthier-Villars et Cie., 1922.) 55 francs.

M. MAREC'S book is written for those who, having a sound theoretical knowledge, are more concerned with the choosing and installing of electrical machines than with the manufacture of them. The operation of the finished machine is discussed mainly by describing its characteristic curves. The engineer is thus enabled to judge which type of machine will prove the most useful for the particular purpose he has in view. The various methods of installing electrical machinery in a workshop are fully described. The book will be of use to the English engineer, as it will show him the best modern French practice, and it will be helpful for him to compare it with his own. The various French methods of charging for alternating-current power will interest him. One method is to charge the consumer for the watt-hours he has consumed. In addition a further charge is made for the magnetising hours, this further charge only being zero when the consumer uses apparatus the power factor of which is unity. The latest French rules for standardising apparatus and methods in electrical engineering are given. The comparison of them with the American and English rules is instructive.

Orographical, Regional, Economic Atlas. Edited by T. Franklin. Part 4: Africa. Pp. 32. (Edinburgh: W. and A. K. Johnston, Ltd.; London: Macmillan and Co., Ltd., n.d.) 1s. 6d. net.

THIS collection of forty-seven diagrams and maps of Africa and parts of Africa is wonderfully good value. It includes a coloured orographical map of the whole of Africa and sectional maps of the same on enlarged scales. A uniform scale for these sectional maps would have been an advantage. The maps appear to be accurate and revised to date. The allocation of the Cameroons to the League of Nations on one map is apparently a slip. The atlas deserves a wide use.

The All-Electric Age. By A. G. Whyte. Pp. xiii+242. (London: Constable and Co., Ltd., 1922.) 7s. 6d.

MR. WHYTE gives an interesting and accurate account of the latest electrical developments. He has refrained from speculating about the future, but we think that if he had pointed out the directions in which advances will probably be made he would have added to the interest of the book.