

Although there is an appendix on the adjustment of the transit and level instruments, it is thought that some space might have been advantageously devoted to drawings and details of surveying instruments. The tables are very complete and include tables for use in barometric levelling.

More information on the design of structures, maximum loadings, etc., would be an improvement, and Chapter LV. on "Trestles," might have been enlarged to include more details of the strength of materials and the practical design of steel, ferro-concrete and wooden bridges, etc.

It is thought that less space might have been given to rolling stock and more to actual railway construction, electric as well as steam railways.

The book is well arranged and the printing is good.

**Handbook of Engineering Mathematics.** By Walter E. Wynne, B.E., and William Spraragen, B.E. Published by the D. Van Nostrand Co., New York. 220 pages, 113 illustrations,  $4\frac{1}{4} \times 7$  ins., flexible leather. Price, \$2 net. (Reviewed by Prof. Alfred Baker, University of Toronto.)

This book contains in most convenient form the various formulæ and results in mathematics and physics which engineering students have encountered in their college days and to which reference is continually necessary in the subsequent practice of their profession. It is something more, however, than a mere list of formulæ; throughout most valuable suggestions and reminders are given as to how results are reached; and thus the book is a sort of compendium of the mathematical and physical studies of the engineer. It is seldom that one meets with a book in which scientific knowledge has been so judiciously combined with teaching skill and sound common-sense. By keeping this work with him the engineer is saved the trouble of carrying about a considerable library; and, most important, he will be prevented from forgetting what he laboriously acquired when a student. To engineering students it will prove a valuable condensation of their work in mathematics and physics. The book has an additional use to teachers of mathematics and physics who are not themselves engineers—it suggests what portions of various subjects should be given to classes in engineering. The tables at the end of the work will be found to be those to which the profession most frequently has need of reference. As an illustration of the printer's and binder's art the book, in a way, is perfection. It can conveniently be carried in the pocket. Any engineer who sees the work will at once feel he must own it.

**Operation and Maintenance of Irrigation Systems.** By S. T. Harding, Assistant Professor of Irrigation University of California. Published by the McGraw-Hill Book Co., Inc., New York. First edition, 1917. 271 pages,  $6 \times 9$  ins., 25 illustrations, cloth. Price, \$2.50. (Reviewed by A. S. Dawson, M.Can.Soc.C.E., M.Am.Soc.C.E., chief engineer, Department of Natural Resources, Canadian Pacific Railway, Calgary.)

As brought out in the author's preface, the subject is one of broad interest; and there is comparatively little published material relative to the subject, which is easily obtainable and generally available.

The book consists of nine chapters and an appendix. Chapter I, "General Maintenance," deals with difficulties met with, detrimental agencies to earth work, silt problems, vegetable growth, etc.

Chapter 2, "Maintenance of Irrigation Systems," deals with the serviceable life of various types of structures and the class of materials used.

Chapter 3, "Organization for Operation and Maintenance," deals with the necessary staff and the duties of same.

Chapter 4, "Methods of Delivering Irrigation Water," deals with the merits of continuous flow vs. rotation delivery, forms used for water delivered, and results obtained.

Chapter 5, "Measurements of Irrigation Water," deals with hydrography, measuring devices, and water records.

Chapter 6, "Rules and Regulations," deals with many important matters relative to this particular subject.

Chapter 7, "Payment for Structures and Operation Charges," gives a comparison of charges made and factors affecting such.

Chapter 8, "General Operation," refers to many of the difficult problems met with in such work, and deals with matters of policy as affecting economy.

Chapter 9, "Operation and Maintenance Accounts," deals with accounts, reports, circulars and records.

Each chapter is supplemented by a list of references, some of which have been made use of in the text. The book as a whole would form a valuable addition to the library of any one interested in the general question of operation and maintenance of irrigation systems.

The book is not technical, and only attempts to cover the problems met with on such work in the United States, and to a limited degree in Canada.

**Public Utility Rates.** By Harry Barker, Mechanical Engineer, Associate Editor "Engineering News," Mem.Am.Inst.E.E. Published by the McGraw-Hill Book Co., Inc., New York. First edition, 1917. 387 pages,  $6 \times 9\frac{1}{4}$  ins., cloth. Price, \$4. (Reviewed by George T. Clark, designing engineer, Toronto Harbor Commission.)

The growth in the demand for information regarding the valuation of public utilities has been remarkable in recent years. There are a number of reasons for this demand, one of which is that many public utilities are being put in charge of commissions which, when asked to authorize additions to securities or changes in rates, usually request that valuations of the properties be made.

A great deal of valuable information relating to the valuation of utility property and the fixing of utility rates existed in numerous public papers, but the contradictory views expressed by those engaged in the work and the opposite positions taken by the public authorities and courts as to the proper basis of valuing such property, indicated that no real effort to digest and compile this material had been made, and that prior to 1912 "there existed no general practise or well-formulated theory of the valuation of utility property or the fixing of utility rates."

In 1912 two books were published, "Engineering Valuation of Public Utilities and Factories," D. Van Nostrand, by Foster, and "Valuation of Public Utility Properties," McGraw-Hill, by Floy.

These two volumes dealt with valuations and purposes of valuations, discussing at length the questions of structural and intangible costs, franchises, good-will, going value, appreciation and depreciation, with numerous examples of appraisals of public utility properties.

In the volume under review, the author goes farther afield and seems to have for his purpose "the presentation of a broad survey of the rate problem free from the mass of obscuring detail which necessarily marks individual cases."