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BOOK REVIEWS.

Bridge Engineering. By J. A. L. Waddell, D.Sc., LL.D., M.Am.Soc.C.E., etc., etc. Published by John Wiley & Sons., Inc., New York. First edition, 1916. In two volumes. 2,177 pp.; profusely illustrated; 6 x 9 ins.; cloth. Price, $10 net. (Reviewed by H. M. Mackay, M.Can.Soc.C.E., M.Am.Soc.C.E., Professor of Civil Engineering, McGill University.)

This important work may, in a sense, be considered to have grown out of the author's previous well-known book, De Pontibus. But as the amount of matter is at least seven times as great, it is evident that it will occupy a very different place in engineering literature. It differs from the ordinary treatises on bridges in that, for the most part, the calculation of primary stresses is taken for granted. This seems a desirable feature, inasmuch as this particular field is well covered by numerous other works. Nevertheless, there is a full discussion of the various methods of calculation in common use; and a considerable amount of space is devoted to the computation of secondary, temperature and other statically indeterminate stresses, and to the deflection of beams and framed structures. While beginners may possibly get a better grasp of the principles involved in this connection from other works, the discussion of the methods for the elimination or reduction of secondary stresses is much fuller and more satisfactory in the present volumes. The treatment of the stresses in reinforced concrete bridges of all types is quite full, and is accompanied by many useful diagrams to facilitate computation.

On the other hand, the distinctive feature of the work is the extended treatment of almost innumerable questions which are briefly dismissed or entirely passed over in other books. Special attention may be directed, among others, to the chapters on Alloy Steels in Bridgework, Intensities of Working Stress, First Principles of Designing, Detailing in General, Shopwork as Affecting Bridge Design, Floors and Floor Systems, Laterals and Sway Bracing, Determination of Waterways, Estimates, Office Practice, Inspection, Erection and Falsework, Maintenance of Traffic, and Maintenance and Repairs. Throughout, the author's point of view is that of a consulting engineer, whose interests are those of his client. While true economy is always kept in the foreground, excellence of design is never subordinated to practices whose chief object is the cutting of shop costs to the irreducible minimum. Nor does the author hesitate to condemn the system, as prevalent here as in the United States, of leaving the design of structures in the hands of bridge contractors. In the treatment of shopwork as affecting design, however, the views of such well-known representatives of the bridge companies as Messrs. Wolfel of the McClintic-Marshal Co., and Reichman of the American Bridge Co. are fully given.

Metal arches, cantilevers, suspension bridges and movable bridges of all classes are treated in a general way. The treatment of foundations is also relatively brief; but many examples of difficulties encountered and expedients adopted in the author's practice are mentioned.

Very full and valuable data are given on the weights of steel in superstructures, and the quantities in piers and abutments. No other treatise which we can recall compares with the present one in this respect.

More than 250 pages are devoted to specifications governing all classes of bridgework, and the work ends with a very extended glossary of the terms used in bridge construction, and a well-arranged index.

The author is to be congratulated in that he has withheld from his readers little or nothing communicable, which he has gathered from his extended experience. He has projected his personality into his work with unusual frankness; and while some may regard this as a defect in a technical work, others will, no doubt, deem it not the least interesting feature. Complete agreement with all the author's views, so fully set forth, is not to be expected. It may be said, however, that, whether considered as a whole or in detail, the book makes for the highest class of bridge engineering. It seems likely to prove indispensable to most bridge engineers; and it is certainly a veritable mine of information for all beginners.

The Construction of Roads and Pavements. By T. R. Agg, C.E., Professor of Highway Engineering, Iowa State College. Published by the McGraw-Hill Book Co., New York. First edition, 1916. 432 pages, 116 illustrations, 6 x 9 ins., cloth. Price, $3.00 net. (Reviewed by H. S. Van Scoyoc, chief engineer, Toronto-Hamilton Highway Commission, Toronto.)

This new highway book brings with it the atmosphere of the typical middle western state college or university. The outstanding characteristic is an endeavor to present information in a way that makes it of practical benefit to people who are actually doing things. The author states that the book is primarily intended as a text in a college course on roads and pavements. It will be found valuable by highway engineers, both as a book of reference and as a hand-book, as it contains numerous tables and diagrams. It is largely a compilation, the sources of information being current periodical literature and other treatises on highway construction, but in the main the material has been well selected. Especially valuable are