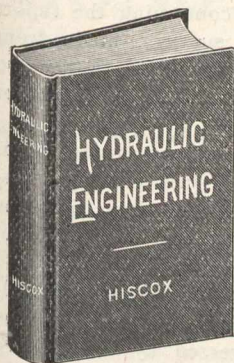


BOOK REVIEWS.

Books reviewed in these columns may be secured from Vannevar & Company, 438 Yonge Street, Toronto, Ont.



Hydraulic Engineering.—A Treatise on the Properties of Water, and Power and Resources of Water for All Purposes. By Gardner D. Hiscox, M.E., author of "Mechanical Movements," "Gas, Gasoline and Oil Engines," "Compressed Air and Its Uses," "Modern Steam Engineering," etc. New York: The Norman W. Henley Publishing Company. Cloth, 6 x 9 1/4 inches, pp. 315; 305 illustrations, \$4.00.

In preparing this book, the author has endeavored to give the public a general treatise on hydraulics in all its branches, and in a measure has succeeded in condensing a large amount of matter into comparatively little space.

For the hydraulic engineer the book is too elementary to be of any use, much more space being taken up in explanation of simple mathematical calculations than is devoted to useful matter on hydraulic engineering. Not only is a large part of the book devoted to the simplest steps in calculations, but these are often put in a form which is not only misleading but erroneous. As an example, we quote from page 86: "Thus the fifth power of 2 is $2 \times 2 = 4 \times 2 = 8 \times 2 = 16 \times 2 = 32$." This is the first time we have noticed that $2 \times 2 = 32$.

As a reference book on hydraulics for engineers engaged in other branches of the profession, the lack of any logical arrangement of the matter renders its use doubtful. The only persons who could get any real value out of the book would be the student who wishes to acquire a general knowledge of the practice of hydraulics, the farmer who is planning irrigation on a small scale, and the various classes of mechanics and workmen who are engaged on minor hydraulic enterprises.

In Chapter I. is given an historical introduction to hydraulics, dating from prehistoric times, which though interesting takes up a large amount of space that might be devoted to more useful matter. The properties of water are taken up in Chapter II., the latter part of which is devoted to various forms of hydraulic presses, punches, etc. Chapters III., IV., and V., take up the flow of streams, and the discharge of orifices, weirs and pipes, and contain some very useful information for persons unfamiliar with this class of work. The syphon and water ram are taken up in Chapter VI. Although we fail to find any satisfactory explanation of the principles of the syphon, space is devoted to no less than twelve illustrations of various types of syphons that have practically no use outside the laboratory.

Chapter VII. deals with the construction of dams and reservoirs, most of the illustrations being of early forms of timber dams, while we regret to note that no consideration is given to the modern types of reinforced concrete dams. Chapter VIII. takes up city and town waterworks, stress being laid on the necessity of filtration and other expedients for securing a pure supply.

Chapter IX. is devoted to ordinary wells with a few pages dealing with artesian wells. The latter are, however, taken up at length and in a clear and concise manner in Chapter XI., the intervening chapter dealing with the principles of the air-lift method of raising water with a short description of the hydraulic air compressor plants in Quebec and British Columbia.

Chapter XII. on irrigation is probably the most useful part of the book, and deals at length with the various methods in use in the United States. Some useful information is given on the amount of water required for irrigation in various districts and the methods of applying it to the soil.

Chapter XIII. is devoted to water wheels and turbines, and illustrates the usual types of mill wheels and wheels used

for raising water for irrigation purposes. Pumps and pumping machinery are taken in Chapters XIV. and XV., and hydraulic power transmission in Chapter XVI.

Chapters XVII. and XVIII. contain information on various subjects, such as hydraulic mining, canals, ditches, and pipe lines for irrigation. The remaining two Chapters XIX. and XX. are devoted, respectively, to resistance and skin friction of bodies moving through the water, and to a short description of various devices for developing power from wave motion and tidal flow.

In conclusion we would say that although this book is of very little use to the professional engineer, it would be of value to the large class of men who, though not engaged on technical work, are interested in hydraulic engineering, either financially or through business connections. This would apply especially to those who are connected with propositions on irrigation or water-power development.

R.E.C.

Railway Surveying.—By B. Stewart. Published by E. & F. N. Spon, Limited, 57 Haymarket, London, Eng. Size, 4 x 7; pp. 130. Price, 50 cents.

The author was for some time assistant engineer on the Cyprus Government Railway and the Grand Trunk Pacific Railway of Canada, and it was doubtless while serving in these positions that he conceived the idea of publishing a book that would be useful to the beginner on railroad work. The book is an elementary work on field practice, and is carefully written, aiming at making clear the various operations in chaining, levelling and cross-sectioning.

Chapters I. and II. deal with "chaining," explains the various chains used, and devotes some fourteen pages to methods of chaining around obstacles.

Chapters III. and IV. describe the operation of levelling, setting cross-section stakes, and gives a page, showing the author's method of keeping a field book for level notes.

Chapter VI., on vertical curves, is one of the best in the book, giving clearly methods of laying out vertical curves, yet not giving so much detail and mathematics that the reader becomes confused.

The concluding chapter is devoted to hints and problems, all of which are simply explained and clear in their application. For the young man just entering upon railroad work the book will be helpful.

Elements of Railroad Engineering.—By William G. Raymond, C.E. Publishers, John Wiley & Sons, New York. Size, 6 x 9; pp. xvi. + 405. Illustrations and diagrams.

The volume is divided into three sections. Part I. describes the permanent way in some detail; Part II. discusses the fundamental principles governing the design of the grade line, while Part III. describes the methods of applying these principles to secure the most economical location and construction. The book is evidently prepared by a man familiar with railroad location, construction and operation, familiar with it from actual working experience. Under the head of permanent way, alignment; rail manufacture, life, shape, and inspection; rail fastenings, joints, and spikes are fully discussed. A chapter on cross-ties is one of the most valuable in the book. Ballast and Roadbeds in some four pages. Bridges and Culverts are discussed at some length, a few designs submitted and formulæ given that may be used in estimating weight and cost of structures.

Chapter IV., covering twenty pages, describes and illustrates, with dimensioned sketches, various types of bridges, culverts, and minor structures. Timber, concrete masonry and steel structures are described. Turnouts, side tracks, and yards are fully discussed, and drawings illustrating the various types given.

In the chapter on the elevation of the outer rail, after the matter has been discussed and formula derived, the following rule is given: The difference of level in inches of the two rails of a curved track of standard gauge is from two-thirds to seven-tenths of one one-thousandth of the square of the speed of passing trains multiplied by the degree of the curve.