

Chapters 19 to 21 deal with the relation of dam and power station, the principles of their construction and appendages of dams.

The cost of power plants and of power, the financial and commercial aspects of power development, and the analysis of water power projects are discussed in Chapters 22, 23 and 24. This section gives a much-needed warning against the financing of undesirable developments, and forms a valuable commentary on the economics of hydro-electric developments.

A criticism that may occur to the engineer after going over this book carefully is that perhaps too little attention has been given to recent modern developments using the single runner vertical type unit with scroll case and concrete draft tube, and to the various appurtenances such as trash racks and rock cleaning devices, flashboards, etc., and too much attention has been devoted to the old type multiple runner horizontal setting.

The treatment of the flow of water in pipes may appear to some to be inadequate. The economics of steel pipe line follows present-day practice, but leaves much to be desired. The method of balancing lost power through friction and cost to secure the most economical development might profitably be discussed with reference to such hydraulic elements as the canal or feeder pipe, the forebay and rocks and penstock.

While the value of the new edition might have been enhanced by the elimination of the defects above specified, it more than maintains the standing of the first edition as probably the most useful hydraulic treatise extant in the English language.

**The Elasticity and Resistance of the Materials of Engineering.** By Prof. Wm. H. Burr. Published by Messrs. John Wiley & Sons, New York; Canadian selling agents, Renouf Publishing Co., Montreal. Seventh edition, revised, 1915. 927 pages, 173 text figures and 3 plates, size, 6 x 9 ins., cloth, Price, \$5.50. (Reviewed by David A. Molitor, C.E., Designing Engineer, Toronto Harbor Commission.)

This work, which appeared in its first edition in 1883, is the most important and best known volume from the pen of Prof. Burr, for which reason no very lengthy review is considered necessary.

The book consists of two main parts and three appendices.

Part I., analytical, contains six chapters with the following chapter headings: 1, Elementary theory of elasticity in amorphous solid bodies; 2, Flexure; 3, Torsion; 4, Hollow cylinders and spheres; 5, Resilience; 6, Combined stress conditions.

Part II., technical, contains twelve additional chapters as follows: 7, Tension; 8, Compression; 9, Riveted joints and pin connections; 10, Long columns; 11, Shearing and Torsion; 12, Bending or Flexure; 13, Concrete steel members; 14, Rolled and cast-flanged beams; 15, Plate girders; 16, Miscellaneous subjects, curved beams, springs, flat plates, rollers, etc.; 17, The fatigue of metals; 18, The flow of solids.

Appendix I. treats of "Elements of Theory of Elasticity in Amorphous Solid Bodies" in three chapters, as follows: 1, General Equations; 2, Thick, Hollow Cylinders and Spheres, and Torsion; 3, Theory of Flexure.

Appendix II. devotes three pages to "Clavarino's Formula for Thick Cylinders."

Appendix III. gives four pages on "Resisting Capacity of Natural and Artificial Ice."

The present edition has received a very general revision with the aim of supplying new material to meet the advancing requirements of the profession. The empirical

data has been materially enhanced, by the inclusion of results from more recent experimental investigations. The limitations set by a single volume preclude the possibility of exhausting this wide field of research which has received so much attention during the past decade.

The book might have been improved in its general arrangement by eliminating some of the approximate derivations which consume considerable space. These might have been given as approximations following the more exact demonstrations. Thus, arts. 24 to 33, covering 58 pages, deal with the theorem of three moments and beams involving redundancy, which problems can be more comprehensively solved by the use of the one general work equation which affords solutions to all redundancy problems with any degree of accuracy or approximation desired.

Other instances of this kind are noticeable, and space being a consideration in such a voluminous work, greater economy in this direction might have been practised without detriment to the book.

The author's treatment of reinforced concrete beams is commendable in this respect. The T-beam, being the more general case, is treated first, and the formulæ for plain rectangular beams are obtained by appropriate simplifications.

It is regrettable, however, that the high unit working stresses proposed in "the report of the Committee on Concrete and Reinforced Concrete" of the American Society of Testing Materials should find such a warm reception in the present treatise. If it is prudent to employ a factor of safety of about four for a material like steel, it is obviously unwise to allow a safety of only three for concrete on the basis of 28-day tests.

The calculus is freely employed, but this cannot be regarded as objectionable when dealing with intricate matters. The nomenclature is not generally uniform with American practice, so that a tabulated summary would have been a very useful addition.

On the whole, this volume contains much valuable information both for use as a text and reference book. In style, it corresponds to the uniform excellence of the Wiley publications.

**Rivington's Notes on Building Construction.** Edited by W. N. Twelvetrees, M.I.Mech.E. Published by Longmans, Green & Co., London. Part I., 306 pages; 484 illustrations. Part II., 332 pages; 395 illustrations; 6 x 9 ins.; cloth. Price, \$2.25 each.

When to the title of this work we add the words "as practiced in England," and give a list of twenty-one names of contributing authors (including the names of some of the best-known architects and engineers in England), and mention at the same time that the present edition is the last revision of a book that has been a standard text for forty years, its character is well displayed.

It is intended as an authoritative text and hand book for students and architects, and certainly the comprehensive character of its subject matter, the concise yet clear treatment that prevails, and the prestige of the authors would indicate that its object is fulfilled.

Unfortunately, there exists so marked a difference in building methods and devices in England and on this continent that the Canadian reader will find the work of secondary value only. The architect or engineer fully conversant with American practice can use it with profit as a fertile source of suggestion, but not so the student if he hopes to put his reading into practice.

Unlike many books on building, Rivington's Notes does not indulge in pages of futile description in cases