and its effect on timber, and various other pertinent matters.

Part 3 deals with working stresses for structural timbers. This part will be found of great use to architects and engineers, for it goes very carefully into the question of working stresses for joists, planks, beams, stringers, round posts, wooden columns, etc., with tables showing the comparative strengths of various American timbers. Part 4 treats of timber testing, forms of material tested, size of specimens in relation to tests, moisture determination, machine for static tests, speed of testing machine, with numerous descriptions of tests. At the end of each part is a list of references to questions dealt with in the respective part. The work has a good index.

Charts and Data on Marine Boiler Design : a Summary of the Standard Formulæ in Chart Form with Tables and Notes. By H. C. Walker. Pp. xii + 55. (London : Chapman and Hall, Ltd., 1931.) 25*s.* net.

THOUGH to-day in all naval vessels, and in a considerable number of mercantile vessels, water-tube boilers are used, the standard form of boiler for ships, both small and large, has been that with a cylindrical shell and internal cylindrical furnaces, from which the gases pass into vertical combustion chambers and through nests of tubes. Such boilers are sometimes referred to as return-tube boilers, as the smoke returns to smoke-boxes fitted at the same end as the furnace mouths ; but to all marine engineers they are just known as marine boilers. The design of this type of boiler involves the consideration of the strength of cylinders, of flat plates, of corrugated furnaces, and of riveted joints ; and the dimensions of the various parts are governed by rules laid down in an official document, "Standard Conditions for the Design and Construction of Marine Boilers", published by H.M. Stationery Office. From the formulæ given in these rules the calculations are made. To obviate the necessity for these calculations, Mr. Walker has prepared a series of 17 charts and 25 tables, from which, once his methods are grasped, readings are the work of a few moments only, and the possibilities of error are practically eliminated. The size of the volume, 13 in. × 10 in., has enabled the charts to be of a sufficiently large scale ; they are printed on stout paper, and have been rendered easy for reference. The author has thus provided a reference book which should be of much use for all concerned with the design of marine boilers.

Machine Drawing and Design : a Textbook of Intermediate Standard for Engineering Students. By W. Abbott. Pp. 208. (London, Glasgow and Bombay : Blackie and Son, Ltd., 1930.) 7*s.* 6*d.* net.

THIS volume is divided into two parts. Part 1 contains the more important details of machinery, such as fastenings, shafts and fittings, bearings, gearing, valves, parts of engines and turbines, with simple explanations of the principles of design. It is assumed that the subjects of mechanics and the strength of materials are being studied conjointly. Part 2 is devoted entirely to exercises, and includes some examples taken from university and Whitworth scholarship examination papers. Most of the drawings are presented in pictorial form, thus preventing the mere copying of orthographic projections and enabling the appearance of the object to be readily understood. The designs included are representative of good modern practice.

There is evidence throughout the volume that the author has taken pains to produce an excellent and well-graded course suited to the requirements of intermediate students. Those interested in the teaching of engineering who are acquainted with Mr. Abbott's former work on "Practical Geometry and Engineering Graphics" will welcome the present useful and practical addition to the literature of engineering drawing.

Civil Engineering Design. By Arthur A. Fordham. Pp. xi + 212 (45 plates). (London : Chapman and Hall, Ltd., 1931.) 21*s.* net.

THIS book is intended to be of service in the drawing office to students taking courses in civil engineering who have acquired a knowledge of strength of materials, theory of structures, etc. The volume contains twelve designs completely worked out with the necessary calculations and drawings. These include a steel frame building with grillage foundations, steel dock gates, two steel roof principals, one of which is a two-hinged braced arch, five bridge designs, including both steel and reinforced concrete, a masonry dam and an earthen dam. These designs have been carefully worked out and will be useful to the student in showing how principles are applied in practice ; also by modifying specified dimensions the illustrated designs may be used as models for his own designs.

There are not too many volumes on this subject published in Great Britain ; most of the great mass of material at our disposal is scattered in periodicals and transactions of engineering institutions. The present volume will therefore be appreciated by many busy teachers who have to provide data for students' designs. It is unfortunate that the size of the book—12½ inches by 10 inches—required to present the drawings properly, and its weight, which is about 4 lb., make it clumsy to handle and lead to a good deal of wasted space in the text. In view of the excellence of the matter, however, this must be regarded as a minor blemish.

Mathematics.

Numerical Mathematical Analysis. By Prof. James B. Scarborough. Pp. xv + 416. (Baltimore, Md. : Johns Hopkins Press ; London : Oxford University Press, 1930.) 25*s.* net.

MOST of the ground of Prof. Scarborough's book on numerical analysis is covered adequately for English readers by Whittaker and Robinson's "Calculus of Observations", and the new work interests us chiefly for its revelation of differences between the American material and our own.

The best feature of the book is the attempt