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HAND BOOK OF HYDRAULICS

Reviewed by Thos. Hogg
Asst. Hydraulic Engineer, Ontario Hydro-Elec. Power Com.

By *Horace Williams King*, Professor of Hydraulics, University of Michigan. Published by the McGraw-Hill Book Co., New York City, and Hill Publishing Co., London. First edition, 1918. 424 pages, 112 tables, 90 figures, 4 x 6¾ ins., cloth. Price, $3.00.

A knowledge of the fundamental principles of hydraulics is presupposed in this volume, which is a compilation of the commonly accepted formulæ, together with a certain amount of new information. It is intended primarily to assist in the solution of hydraulic problems and should aid the practising engineer in making the most reasonable application of the available data to each specific problem he meets.

The several chapters comprise the following subjects: Hydraulic units, hydrostatics, orifices, sharp crested weirs, weirs not sharp crested, flow of water through pipes, flow of water in open channels, measurement of flowing water, special problems, general reference tables, comparison of weir formulæ with experiments, comparison of Kutter and Manning and Bazin formulæ with Scobey's experiments.

This little handbook should prove invaluable to the engineer dealing with hydraulic problems. It is the best of hydraulic handbooks published to date.

TECHNICAL MECHANICS

Reviewed by Prof. E. Brown
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By *Edward R Maurer*, Professor of Mechanics, University of Wisconsin. Published by John Wiley & Sons, Inc., New York, and Chapman & Hall, Limited, London; Canadian selling agents, Renouf Publishing Co., Montreal. Fourth edition. 381 pages, illustrated, 6 x 9 ins., cloth. Price, $2.50 net.

This edition of Maurer's Technical Mechanics is practically a rewritten book, many changes, both in the form of omission and addition, having been made. It is evidently the outcome of an earnest endeavor to present to the student of engineering science those fundamental principles of mechanics which underlie an intelligent study of the many problems which he has to face, and in the main the object has been well attained. Ten years' experience of the use of the earlier edition in the author's classes suggested many changes, and new examples have been developed suited to a course of instruction in an engineering school. These examples, numbering nearly four hundred, have been embodied at the end of the present volume, with references to the articles in the text which bear most directly upon the principles involved. They have been selected admirably, and the student of mechanics who can work successfully through them will have a thoroughly sound knowledge of the application of mechanics to technical problems. One regrets that answers are not given to the numerical questions, but the regret is tempered somewhat by the reflection that, after all, this is really a book for the student following a course under a capable teacher, and that a judicious selection of problems will be made, and worked out as a part of such a course. This is not to imply that an isolated student, assuming him to have the necessary knowledge of elementary mechanics and mathematics (including the calculus), would not benefit greatly by a study of this book. But for such, the addition of answers would be the greatest boon, and perhaps they may be added to later editions.

Referring to the text itself, the subject is treated in the order which most teachers find necessary, so that statics come first and then dynamics. The analytical conditions of equilibrium of systems of forces are clearly set forth and graphical methods are used freely. Throughout the various articles, examples are worked in illustration of the principles enunciated, and these are well chosen to fulfil the double purpose (*a*) of driving home the principle and (*b*) of giving the student a clear perception of the usefulness of the principle in his technical work. Attention is drawn to statically indeterminate problems, and to the futility of attempting to solve them by the conditions of statical equilibrium.

Succeeding chapters deal with friction, including wedges, screws and belts, and with centre of gravity and the problems met with in loaded suspension cables.

Much might be said in commendation of the later chapters dealing with dynamics, for in them there is evidence of endeavor to present *real* principles to students in connection with the dynamics of a rigid body. Too frequently, in this connection, "mechanics for engineers" means only the acquisition of certain formulæ written down by analogy from the equations of motion for a particle, in conjunction with an elementary treatment of moments of inertia. Pope said long ago that "a little learning is a dangerous thing," and this is profoundly true in the application of mechanics to technical engineering problems. Professor Maurer, however, devotes much space to a progressive treatment of the motion of a rigid body, giving simple illustrative examples wherever possible, but keeping close to his main object of presenting a logical statement of the fundamentals of the subject. Problems on rotating bodies, impulse, centre of percussion, compound pendulums, etc., are introduced, and there is a section dealing with the phenomena of the gyroscope and some of its applications such as in the gyroscopic compass, the steering of torpedoes, and the mono-rail car. An analysis of the theory of the gyroscope, suited to the degree of attainment of those who have mastered the principles previously explained, is also given.

Many references are given throughout the book to standard text-books in which matters under consideration are treated more completely. Appendices deal with the dimensions of units, and with moment of inertia of plane areas. This section also includes the product of inertia