Int. J. Heat Mass Transfer. Vol. 7, pp. 401–403. Pergamon Press 1964. Printed in Great Britain

BOOK REVIEWS

Guide to the Application of the Laplace Transforms: GUSTAV DOETSCH. D. Van Nostrand Company Ltd. Translation Editor: W. A. MC.A. FAIRBAIRN. 225 pp. 45*s*.

PROFESSOR DOETSCH is an authority on Laplace transforms. In the present book he is mainly concerned with those results and methods of the general theory which are of particular interest in physical applications. Conciseness and clarity are achieved by stating certain theorems, stressing the conditions under which they hold, and referring the reader to an earlier work for the proofs. This enables the author to follow various important routes through the theory without overwhelming the reader with too much detail. Furthermore, this approach has allowed such topics as boundary conditions to be discussed more deeply than is usual.

The applications of the theory to problems in electrical engineering form the basis of the book. For this purpose, the range of topics discussed is admirable. At the outset, a physical meaning is developed for the Laplace transform from the theory of Fourier series and the Fourier integral. This is followed by chapters on those Linear Differential Equations, Finite Difference Equations, Linear Partial Differential Equations and Integral Equations, to which the Laplace transform technique is applicable. The chapter on Finite Difference Equations leading to the Z-transform and sampled-data systems, is particularly good.

The book is rounded off with a discussion of the complex inversion formula and a brief chapter on asymptotic expansions. Stability is discussed in a paragraph and some of the standard methods are not mentioned. There is a useful table of Laplace transforms at the end of the book.

J. MURPHY

Engineering Heat Transfer: SHAO TI HSU. D. Van Nostrand, 1963, 613 pp.

TEXT-BOOKS on heat transfer, once so scarce, are now abundant, and prospective authors on this subject must surely ask themselves if they have anything new to offer before they set pen to paper. This remark applies, of course, to the senior undergraduate and uninitiated graduate level, for whom the preface of this new book tells us it is intended; at higher levels, there will be a continuous need for texts which explain and summarize the results of recent research advances. Lately there has been something of a vogue for giving the whole subject a slightly new look by exploiting the similarities of convective heat transfer processes with those of momentum and mass transfer, and producing text-books which deal with all three. At least two have appeared so far, bearing titles which contain different permutations of the words mass, momentum and heat—four other possibilities remain!

Although Professor Hsu's book does contain short chapters on fluid flow (*alias* momentum transfer) and mass transfer, the major part is devoted to heat transfer and the general treatment is fairly conventional. Separate chapters deal with the different modes, heat-exchangers, thermal properties, etc. and much factual information and many useful explanations are given. It is probably in the latter respect that this book differs from most of its predecessors. The author has clearly gone to a great deal of trouble to give full accounts of many of the simple yet basic notions which tend to be glossed over in other contemporary works. Explanations are generally presented in a commendably lucid form but there are, alas, occasional lapses in accuracy and rigour which hinder and confuse the arguments. Partial differentials mysteriously change into full differentials and similar triangles have to have corresponding sides parallel as well as proportional! Furthermore, certain statements occur which could, by their emphasis, be misleading to the unaided student as, for instance, the closure to the section on dimensional analysis which states that ". . . it is *quite useful* in correlating experimental data" (reviewers italics).

Treatment of the different topics is, in most cases, comprehensive but the cursory account of the heat and momentum transfer analogy is surprising, the Prandtl–Taylor, von Kármán and subsequent developments being mentioned only by name. The book is well supplied with worked examples, references and end-of-chapter exercises, the numerical answers to which are, for some curious and unexplained reason, given for the even-numbered ones only.

As a first book on this subject, there are strong points in its favour and it might well be recommended to the newcomer. For the initiated, the advantages of the book appear to be marginal as it is not likely to contain much in excess of what will already be available in other more compact but less didactic texts.

H. COHEN

Hydrodynamics and Heat Transfer in a Fluidized Bed: S. S. ZABRODSKY. Gosenergoizdat, 1963, 488 pp., 1.61r.

THE book under review deals with a promising industrial process with a wide range of applications. Topics covered in this book are dealt with in scores of works published annually and are discussed at meetings and symposia.

The appearance of S. S. Zabrodsky's monograph is timely and useful as it sheds light on and, in many respects, generalizes a vast mass of information compiled by numerous investigators of various countries.