the spectroscopy of transition-group complexes, Kihara the interactions of convex molecules, Koide and Oguchi the magnetic properties of compounds, Liehr forbidden transitions, McLennan the formal statistical theory of transport processes, Scrocco the interpretation of quadrupole coupling data, and finally Widom the collision theory of reaction rates.

This reviewer found the contributions by Kihara and Widom the most stimulating and interesting. The former is a clear account of how measured quantities such as the second virial coefficient, the diffusion coefficient, or the crystal structure of molecules may be interpreted on the basis of a model which takes intermolecular forces as acting, not between the molecular centers, but between convex cores assumed to exist inside the molecules. Widom gives a penetrating and exceptionally well-written account of recent developments in the collision theory of bimolecular reactions. For instance, he discusses how the redistribution of molecules into internal states, such as occurs in the vibrational relaxation of diatomic molecules, is perturbed when dissociation also takes place.

As is customary in books of this type, there is no particular connection between the various articles, and they are written in whatever form most appeals to the author. The result is effectively a journal of unrelated review articles. Each contribution should be of interest to some groups of readers, but few will want to read them all, or even most of them, with more than superficial attention.

Mathematical Functions

Handbook of Mathematical Functions With Formulas, Graphs and Mathematical Tables. Edited by Milton Abramowitz and Irene A. Stegun. National Bureau of Standards Applied Mathematics Series No. 55. U. S. Government Printing Office, Washington, D. C., June, 1964. Cloth, 8 1/2 × 10 1/2 in., xiv and 1046 pp. $6.50.

REVIEWED BY DAVID MILLER[5]

THIS volume, containing twenty-nine extensive chapters, is one of the biggest bargains ever offered by the U. S. Government and represents a decade of organization and work initiated through the National Science Foundation and implemented by the National Bureau of Standards.

For any worker in the field of applied mechanics this compendium will be a valuable reference of mathematical functions, the differential and integral relations which generate them, recurrence relations, series and asymptotic expansions, approximations of various accuracies, interrelations between functions and extensive tabulation and reference to tabulations of almost all important mathematical functions.

Bound in buckram, with good paper and clear typography, this volume is unlikely to be superseded during the career of most of the readers since it represents the summation of the history of mathematical functions thus far. It is more likely that smaller supplements will update this masterpiece every decade or so. Errors found are few in number and obvious and will be corrected in reprinting, and the first printing has already sold out. The only fault that this obviously enthusiastic reviewer could find was the absence of some treatment of functions of particular interest in fluid mechanics and heat transfer such as the Blasius and Graetz functions.

[5] Institute of Nuclear Science and Engineering, Argonne National Laboratory, Argonne, Ill.

Plates

Grenztragfahigkeits Theorie der Platten. By Sawcuk and Jaeger. Springer Verlag, Germany, 1964. Cloth, xx and 522 pp. 6 × 9 in., DM 106

REVIEWED BY D. C. DRUCKER[6]

THE AUTHORS have written a very comprehensive and valuable survey of available theory, experiment, and practice related to the load-carrying capacity of flat plates. Starting from the three-dimensional theory of plasticity and specializing to generalized stresses and strains (e. g., moments and curvatures), the theoretical approach is properly set in general terms applicable to all structures. Isotropic and anisotropic plates of various planforms are studied with Tresca, Mises, and maximum normal stress types of yield criteria. Upper and lower bound solutions as well as exact answers are compared with elastic behavior. Rupture-or-yield-line theory is presented in great detail because of its usefulness in practice and is compared with extensive experimental results of reinforced concrete slabs. An excellent set of references also is indicated.

[6] L. Herbert Ballou University Professor, Brown University, Providence, R. I. Mem. ASME.