

everyone when, in fact, they are somewhat obscure. The section entitled "Ligand-field Theory" includes an "out-of-the-blue" reference to Hund's rule that is in this category. At the very least a statement of Hund's rule should have been included. Second, the models given for some of the color centers in the alkali halides are several years out of date.

In summary, this book is an excellent introduction to those areas of solid-state physics that are becoming increasingly important for chemical applications.

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Math without meat

EQUATIONS OF MATHEMATICAL PHYSICS. By G. N. Polozhiy. Trans. from Russian. 543 pp. Hayden, New York, 1967. \$14.50

by George Weiss

One of the universal sins characteristic of publishers in both capitalistic and communistic societies is overkill. And one of the favorite targets is the subject of mathematical physics. Although there have been excellent treatments of the subject available for at least 40 years, books on the subject continue to appear at intervals that appear to be tending to zero. I do not want to imply that G. N. Polozhiy's book is not a good treatment of certain aspects of the subject, which indeed it is; rather there are other equally good treatments of the same subjects in many other textbooks.

If one were to characterize Polozhiy's book in a nutshell, it is a good, rigorous, 19th-century treatment of the subject. This treatment includes a rather complete catalog of techniques for solving all types of partial-differential equations in unbounded space and at least some of the methods for taking boundary conditions into account. It struck me as quite odd that the technique of separation of variables makes its appearance first on page 389. The coverage of variational techniques is quite skimpy; no account is given of numerical techniques, and there is in general little solace for the

reader who does not have a partial-differential equation amenable to exact solution. The Wiener-Hopf method and the class of problems to which it applies goes unmentioned although there is a chapter on integral transforms. Variational problems are given short shrift. On the other hand, there are some quite well handled topics, such as the idea of characteristics for hyperbolic equations and the asymptotic behavior of eigenvalues of Sturm-Liouville operators.

Although this is a good book for its treatment of some subjects, it would not be suitable as a text for a course in mathematical physics in an American department because of its important omissions of mathematical topics and because it lacks any real demonstration of how partial-differential equations are actually used in physics.

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Physics in one volume

HANDBOOK OF PHYSICS. (2nd edition) E. U. Condon, Hugh Odishaw, eds. 1626 pp. McGraw-Hill, New York, 1967. \$32.50

by Wolfgang Franzen

The second edition of E. U. Condon's and Hugh Odishaw's monumental one-volume compendium of physics follows the first edition by nine years. Extensive revisions and additions have been made in an attempt to keep the material up to date. This handbook is an heroic effort by one of the last "encyclopedic" physicists (Condon) to condense our increasingly specialized and fragmented science into a volume that one adult of reasonable muscular strength can lift with one hand out of a bookshelf.

Condon personally wrote 16 of the 92 chapters in the handbook. His contributions, on such diverse subjects as vector analysis, kinematics and dynamics of particles and rigid and deformable bodies, the theory of vibrations, electromagnetism, thermodynamics, molecular optics, quantum mechanics and atomic structure, and other subjects, are almost without exception models of clarity and of the

art of condensing much information into readable form. His example has been followed by many of the distinguished groups of contributors. To me, particularly well and conscientiously written appeared to be the chapters on "Wave Propagation in Fluids" by A. H. Taub, "Vibrations of Elastic Bodies" by Philip M. Morse, "Electric Circuits" by Louis Pipes, "Gaseous Conduction" by Sanborn C. Brown and J. Charles Ingraham, "Statistical Mechanics" by Elliott W. Montroll, "Infrared Spectra of Molecules" by H. H. Nielsen, and "General Principles of Nuclear Structure" by Leonard Eisenbud, G. T. Carvey and Eugene P. Wigner.

As one might expect in any compendium of this type, there is also a small number of weak chapters. In this connection, the chapter on "Electronic Circuits" appears inadequate, the ones on magnetic materials too qualitative, "Vacuum Technique" of doubtful value, "Fluorescence and Phosphorescence" outdated and overly empirical, "Atomic Spectra" not particularly enlightening, and the chapter on "Nuclear Reactions" almost completely lacking in references. These defects are more than balanced, however, by the generally high level of the remaining contributions, usually including large and relatively complete lists of references. The chapters by E. Richard Cohen and Jesse W. M. DuMond on "Fundamental Constants," "Nuclear Masses" by Alfred O. Nier, and "Nuclear Moment" by Norman F. Ramsey also contain very useful and extensive tables.

The opposing requirements of completeness and of being up to date cannot be successfully reconciled in any encyclopedia. For this reason, the chapters on the most rapidly changing subjects, such as the one on the "Physics of Strongly Interacting Particles," are not likely to satisfy any reader, through no fault of the author's. In fields that have attained a certain stability of subject matter and understanding, however, an encyclopedia should present as much concentrated information as possible, an aim that is largely though not completely achieved in this book, as indicated earlier.

In regard to the selection of topics, the weakest chapters are frequently the ones on technological subjects. Is it really necessary to include an elementary and old-fashioned chapter on