the fruit of just such a course taught at Case Institute of Technology, there may be preferable alternatives open to the physicist or engineer preparing himself for a career of research. Perhaps the following remarks would apply more to the theoretician than the experimentalist, but the principle still persists.

Limits on the size of a book and the teaching time available during a two-semester course severely curtail the amount of material which can be encompassed. The end result of survey courses too often appears to be that when the physicist or engineer returns home from his brief sojourn in the land of applied mathematics he makes two discoveries: (a) when he really needs a mathematical implement it happens to be one he didn't bring home with him, and (b) many of the ones he brought back could have been bought more cheaply at home in the first place.

The goal then should be the development of a mathematical maturity to temper and complement one's physical intuition, rather than the acquisition of a repertoire of a few mathematical *dei ex machinae*. It often becomes necessary to "roll your own" analysis, and the ability to do this can't be achieved by a crash program.

An alternative program might well include, beyond the bed-rock analysis, separate courses in complex function theory (statistical mechanics, plasma physics, field theory, fluid dynamics), real variables (for Lebesgue integration occurring in other contexts), linear spaces (field theory, quantum mechanics, elementary particle interactions), abstract algebra (transition probabilities, quantum mechanics, crystal lattices), and partial differential equations (all continuum mechanics).

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83[P, X].—R. D. Stuart, *An Introduction to Fourier Analysis*, John Wiley & Sons, New York, 1962, 126 p., 19 cm. Price $3.00.

This book is written from the viewpoint of a physicist or communications engineer and, typically, it deals almost entirely with applications. The first and third chapters are supposed to provide the basic material in the theory of Fourier series and Fourier integrals, but the "proofs" are almost everywhere fallacious, even for continuous functions. The second and fourth chapters contain descriptions of the "usual" functions and their transforms, as, for example, the square wave, saw-tooth, unit impulse, and exponential decay. Chapters V and VI treat applications to circuit analysis and wave motion, including filters, the capacitance-resistance circuit, bandwidth, diffraction, amplitude modulation, and phase modulation (in which the presumably immature reader is suddenly expected to know some Bessel function theory).

The book cannot be recommended for serious students of waveform analysis, and it is hard to see where its value does lie.

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84[P, X].—P. P. Teodorescu, *Probleme Plane in Teoria Elasticitatii*, Vol. I, Editura Academiei Republicii Populare Romine, Romania, 1960, 995 p., 23 cm. Price Lei 42,80.

This book of just under 1000 pages is in Romanian. It is concerned only with plane problems in linear elasticity. The book presents a number of the most important and best known methods for treating plane problems, and gives numerous examples by way of applying the various methods. The book contains a preliminary chapter on the basic formulation and ideas of linear elasticity, four chapters on plane problems in elasticity, and seven chapters on the deep-beam problems for members having rectangular boundaries. In addition, there are appendices, tables of calculations and diagrams, as well as abstracts both in Russian and in English.

This book is actually the first of two volumes which the author is devoting to plane problems in elasticity. The second volume is to consider deep beams with general boundaries, beams of variable thickness, thermal effects as well as vibrations. Some consideration is to be given to viscoelastic and plastic behavior as well as various other nonlinear phenomena.

Chapter I of Volume I deals with the notion of stress and strain, Hooke's law, and thermal effects. The author defines the basic boundary-value problems and discusses the standard variational principles, with brief mention of such questions as existence, uniqueness, St. Venant's principle, etc.

Chapter II deals with the notions of plane stress, plane strain, generalized plane stress, and deep beams of variable thickness.

In Chapters III and IV the author introduces the Airy stress function, the Marguerre displacement function, the formulation of Love, and a number of other scalar functions in terms of which the solutions to plane problems may be presented (or approximated).

Chapter V contains various methods for solving or approximating the solution of plane problems, such as complex or hypercomplex-variable methods, variational methods, methods of operational calculus, finite-difference methods, experimental methods, etc.

In Chapter VI the author gives a systematic treatment of straight beams. Much of the chapter is devoted to the technical theory of bending of beams. Some interesting reciprocity theorems are presented.

Chapter VII is devoted to the study of semi-infinite beams, in particular to the study of half-plane, quarter-plane, elastic-strip, and half-strip problems. A number of particular cases of practical importance are examined.

In Chapters VIII, IX, and X a systematic study of deep beams is made. Approximate calculation methods are used, one of which is due to the author.

Chapter XI concerns itself with the treatment of beams on an elastic foundation. Also included is the rigid punch problem. The final chapter discusses the problem of beams subjected to elastic loads.

In the appendices the author presents much helpful information, such as expressions for biharmonic polynomials up to the 13th degree, Fourier-series and Fourier-integral representations of different functions, and lists of various functions encountered frequently throughout the book. In addition to this, there follow a number of useful tables and graphs.

At the end of each chapter the author furnishes an extensive bibliography. References are made to papers not widely known in this country. If this book were written in a language which was more widely understood, it would serve as an excellent reference book for engineers working in the area of theoretical and applied mechanics. Supplemented by other pertinent material it could actually be used as a text for an advanced course in Strength of Materials or a course in Plane Problems in Elasticity.

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85[S, X].—G. Birkhoff & E. P. Wigner, Editors, *Proceedings of Symposia in Applied Mathematics, vol. XI, Nuclear Reactor Theory*, American Mathematical Society, Providence, R.I., 1961, v + 339 p.

This book contains the nineteen papers presented at the Symposium on Nuclear Reactor Theory jointly sponsored by the American Mathematical Society and the Office of Naval Research which was held in New York City, April 23–25, 1959. The expressed purpose of the present volume is to increase the number of mathematicians who will devote "serious effort to the mathematical problems of nuclear reactor theory," by indicating a variety of mathematical problems encountered in this field. There is a considerable diversity in the content and approach taken in the various papers, ranging from papers oriented towards the physical aspects of the problems to those of a purely mathematical nature.

The volume begins with an excellent paper entitled "Reactor Types" by A. M. Weinberg, which furnishes a background for the symposium. As is pointed out there, despite the diversity of neutron chain reactor types, "In every case neutrons induce the basic energy-liberating fission reaction, and they are themselves produced by the fission reaction. It is this property that gives to nuclear reactors their name—'chain reactors'—and to the mathematical theory of nuclear chain reactors a beautiful unity." The general chain reactor equation is set up in terms of the neutron flux as a function of the basic variables of position, energy, velocity direction, and time. In this paper problems associated with the treatment of the general equation are discussed, and various simplifying assumptions appropriate for the several types of reactors are outlined.

E. P. Wigner surveys some of the more interesting mathematical problems of nuclear reactor theory. Papers treating particular mathematical problems associated with the reactor equations and processes include: G. Birkhoff, on "Positivity and Criticality"; G. J. Habetler and M. A. Martino, on "Existence Theorems and Spectral Theory for the Multigroup Diffusion Model"; and a paper by G. M. Wing on spectral theory problems associated with transport theory.

The problem of the deep penetration of radiation, which is important in reactor shielding problems, is discussed in a paper by U. Fano and M. J. Berger.

J. E. Wilkins, Jr. derives the diffusion approximation to the transport equation.

A set of papers on numerical methods includes: R. Ehrlich, concerning one-dimensional multigroup diffusion calculations; R. S. Varga, on solving the multi-dimensional, multigroup diffusion equations; R. D. Richtmyer, concerning the application of Monte Carlo methods; B. Carlson, concerning the solution of the neutron transport equation; and R. Bellman and R. Kalaba, on the application of invariant imbedding to the solution of some one-dimensional problems of neutron multiplication.

The treatment of two problems associated with the determination of the energy