Fourier Series. By Georgi P. Tolstov. Transl. from Russian by Richard A. Silverman. 336 pp. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1962. $13.00. *Reviewed by Ellis H. Dill, University of Washington.*

ALTHOUGH it reads as easily as a novel, this is a thorough and rigorous presentation of Fourier series. The mathematical tools are elementary and the book is suitable as a text for a one-quarter senior course in applied analysis.

The author considers trigonometric Fourier series, theory of orthogonal systems, Bessel functions, and the usual applications of the eigenfunction method. The treatment of trigonometric series is unusually complete and clearly stated, and the subject is viewed with computational aspects in mind. The treatment of orthogonal systems and Bessel functions is minimal.

This book may certainly be recommended as a reference book and even as a bedtime story for research workers and teachers.

Operational Methods for Linear Systems. By Wilfred Kaplan. 577 pp. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1962. $10.75. *Reviewed by T. Teichmann, General Dynamics Corp., General Atomic Division.*

LINEAR differential equations and their application to physical problems have long been one of the most popular subjects for mathematical and applied physics texts, and the appearance of another expository work in this well-cultivated field requires some justification. In the case of Kaplan's book this is provided (subject to the comment below) by the wide span of topics covered from the point of view both of technique and of mathematical depth. The subject matter ranges from existence theorems to the mechanics of the root-locus method, and includes complex-variable theory, Fourier series and integrals, Laplace transforms, and linear differential equations with variable coefficients, all in some detail. Among features particularly worthy of note are fairly extended discussions of finite Fourier and Laplace transforms, a systematic, if brief, discussion of generalized functions (i.e., δ-functions and their derivatives), complemented by a short appendix on the operational calculus of Mikusinski, and a comprehensive and useful discussion of Green's functions and the related "system functions" for linear differential equations with variable coefficients. Each section is accompanied by a number of problems and their answers, and all important tables of transforms are gathered in an appendix as well as included in the text.

While the material covered is extremely comprehensive, in this reviewer's opinion, the author would have done better to have concentrated on those (many) aspects of the work which are not to be found to any appreciable extent in other books of this kind, and to have eschewed the complete presentation of "standard" material. Nevertheless, the almost encyclopedic nature of the contents will make this book very valuable as a reference, and with some self-discipline, it should also be useful as a text.

Group Theory and Its Application to Physical Problems. By Morton Hammermesh. 509 pp. Addison-Wesley Publishing Co., Inc., Reading, Mass., 1962. $15.00. *Reviewed by Carson Flammer, Stanford Research Institute.*

A SUBJECT not usually stressed in the formal education of theoretical scientists is group theory. Fascinating in its own right, it is also an important tool in those aspects of theoretical physics where symmetry is involved. Since their publication in 1931–1932 until quite recently, the German classics by Weyl, Wigner, and van der Waerden were main references for group-theoretical methods in quantum physics. Useful supplements to these, known I am sure to many US scientists, have been sets of notes based on lectures by Dr. Hammermesh at Argonne National Laboratory during the past several years. These notes have now been expanded into a good-sized book that gives a detailed treatment of many aspects of group theory that are of importance for the application of group-theoretical methods to certain quantum-mechanical problems in atomic and nuclear physics.

The book opens with a chapter on the rudiments of the theory of finite groups, but only those aspects that are directly relevant to the future applications are included. As a consequence, such useful and simple group-theoretical concepts as ring and field are not even mentioned. In the excellent second chapter on the so-called symmetry groups, not only the well-known 32 point groups are derived, but also the additional 58 Shubnikov groups (called "color groups" by the author), which together with the point groups yield the 90 magnetic point-symmetry groups that pertain to crystals with a magnetic structure. Several fine chapters on various aspects of the representations of groups follow. Applications are then made to the splitting of degenerate atomic energy levels by a perturbation, to selection rules for optical transitions, and to coupled systems. Next comes a long chapter on the symmetric group that is important in the case of a system of identical particles. Then there is a chapter on continuous groups that contains sections on the structure of Lie groups and their algebras, subjects which are useful, for example, in understanding the structure of various dynamical theories (see E. C. G. Sudarshan, *1961 Brandeis Lectures in Theoretical Physics*, Vol. 2, published by W. A. Benjamin, Inc., New York). A well-done chapter follows on the rotation groups in two and three dimensions with applications to the splitting of atomic levels in crystalline fields for both single- and double-valued representations, and to the coupling of angular momenta. A chapter on irreducible tensors in n-dimensional space is followed by one dealing with applications to atomic and nuclear spectra. The last chapter treats the ray or projective representations, with which quantum mechanics is really concerned, and little groups or the