P(x) is a quadratic form, is considered fully. These topics are of special interest to physicists, as is an appendix (transposed from Volume 5 of the Russian edition) on generalized functions of complex variables.

Numerous applications are given, in varying degrees of depth. Examples: evaluation of divergent integrals; elementary solutions of differential equations; the Cauchy problem (including the formulas of Herglotz-Petrovsky for hyperbolic equations); "operational calculus".

The book is written in a beautifully clear and convincing style; the translation is extremely careful and natural - there are very few misprints, those of the original having been mostly rectified. In short, it is difficult to formulate any complaints about the volume at all; readers who find too little mathematical sophistication need only turn to the second volume.

Colin Clark, University of British Columbia

Generalized Functions and Direct Operational Methods Volume One, by T. P. G. Liverman. Prentice Hall Inc. Englewood Cliffs, N.J., 1964. xii + 338 pages.

The first volume, which is reviewed here, is meant to serve both as an introduction to the theory of generalized functions, via what the author calls the D'_+ space, and to show how this concept can be applied to linear problems in analysis. The applications are devoted primarily to the solution of ordinary differential equations with constant coefficients. As the author states in his preface, the audience at which he aims is applied mathematicians, engineers and physical scientists. The mathematical prerequisites for the mastery of this book are a knowledge of advanced calculus as taught at the third or fourth year level in most U.S. and Canadian universities.

With these rather minimal requirements the author rigorously develops the theory to a considerable extent without clouding over the main ideas. Most of the exposition in this first volume is clear, concise and straightforward. Although there are many clean and neat proofs, there is never any recourse to short obscure proofs. This is one of the book's chief merits. Another is the plentiful supply of graded exercises which allow the reader to develop a mastery of the subject matter. These can, as the author points out in his preface, be broken down into three types:

1. direct applications of material in the text,
2. exercises designed to obtain results by alternate means,
3. exercises designed to develop the theory of other classes of generalized functions by arguments similar to those used for the class D'_+.

The introductory of zeroth chapter is a heuristic description of generalized functions and direct operational methods. It also contains a brief resumé of the development of operational techniques in analysis. In chapters I-IV an easily understood development of generalized functions is presented and the resulting theory is applied to the solution of certain linear problems in analysis, primarily the solution of ordinary differential equations with constant coefficients. Chapters V and VI are more mathematical in nature and are devoted to studying structural properties of generalized functions. In these two chapters the author develops deep structural properties of the D'_+ functions, using as tools techniques of advanced calculus and arguments based on these techniques which he develops in the course of his exposition. One noteworthy example of the latter is the Lebesgue method of resonance in Chapter VI. Chapter VII introduces the Laplace transform of a certain subclass of D'_+, which of course includes the usual functions to which the Laplace transform is applicable in the classical sense. It is then applied to the solution of linear ordinary differential equations, linear difference equations and linear partial differential equations. Chapter VIII is an introduction to periodic generalized functions and the theory of generalized Fourier series. The treatment in this chapter is more cursory than in chapters I-IV because, as the author points out, the exposition here is similar to that of Chapter II.

From a pedagogical point of view this is an exceptionally well written book. It could serve as the basis for an honors or graduate course for engineers and applied mathematicians or for self teaching provided the reader has a background in advanced calculus.

R. Datko, McGill University

Elements of Mathematics Logic, by P. S. Novikov. Translated by L. F. Boron, with Preface and Notes by R. L. Goodstein. Addison-Wesley Publ. Co., 1964. xi + 296 pages. $7.95.

The author of this book is the same Novikov who showed the unsolvability of the word problem for groups and disproved Burnside's famous conjecture. The present book is a textbook in mathematical logic on the upper undergraduate level. The first four chapters are concerned with the predicate calculus, along the lines of the classic treatment of Hilbert and Ackermann, while the last two chapters are concerned with an axiomatic arithmetic and proof theory, including a complete proof of the consistency of a restricted system of number theory. One of the major themes throughout is the distinction between "actual infinity" (that is, the idea of an infinite set whose construction is completed and which can itself be operated on as a distinct entity) and "potential infinity" (that is, the idea of a process which can be carried out an arbitrary number of times to produce distinct objects,