families) of functions which occur in practice. A basic theme, namely completion, is applied to a number of function spaces; e.g. it is shown how the Lebesgue integrable functions may be obtained by completion of a space of step functions. Another application of the method of completion leads to the distributions or generalized functions. Distributions are discussed from the beginning both as (generalized) limits of fundamental sequences of functions and as continuous linear functionals. This method had not been published before; it combines the original approach of S. L. Sobolev and L. Schwartz with those of the more intuitive elementary theories developed by the author and others. Delta sequences, or fundamental sequences belonging to the delta distribution, provide a unifying theme for a large class of theorems on convergence and approximation. Topics: Various kinds of convergence; metric spaces and normed vector spaces; completeness and completion; the Banach spaces L, L^p, $\mathbb{C}$; continuous linear functionals; distributions (two sections); delta sequences and convergence and approximation; spanning sets and Schauder bases.

Chapter Three deals with integration theory. The properties of Lebesgue integrable functions are developed further. Emphasis is on how to operate with Lebesgue integrals, and thus on theorems dealing with termwise integration, inversion in the order of integration, differentiation under the integral sign, and change of variables. Stieltjes integrals are introduced for the discussion of line integrals. Among the applications is a fairly general form of Green's Theorem in the plane not found in other books, which leads directly to the general form of Cauchy's Theorem for line integrals in the complex domain. "The brief and to some extent original sketch of complex analysis at the end of the chapter will be sufficient for the applications in Volume 2." Topics: Definition of the Lebesgue integral; approximation of integrable functions and applications (among the latter: Riemann-Lebesgue Theorem, improper Lebesgue integrals); integration of sequences and series; Lebesgue measure; functions of bounded variation and the Stieltjes integral; "rules based on the use of indefinite integrals" (indefinite Lebesgue integrals, absolute continuity, fundamental theorem of calculus, etc.); multiple integrals; curves and line integrals; holomorphic functions and integrals in the complex plane.

The reviewer can only recommend this book very highly: as a text in formal courses, as a source of reference for students and workers in the physical sciences or engineering, and for reviewing purposes for anyone interested in "applied mathematics". He is eagerly awaiting publication of Volume 2.

Eberhard Gerlach (Vancouver, B.C.)

Wahrscheinlichkeitstheorie und Grundzüge der Maßtheorie, by Heinz Bauer. Walter de Gruyter and Co., Berlin, 1968. 342 pages. DM 32.

This is an introductory but fairly high-level text on measure and probability theory. The two subjects of the book are well-balanced although not all of the material on measures is actually needed in the sections on probability.

The first part, on integration theory, treats measures as set functions in spaces without a topology, and leads up to the product of finitely many measures. It is followed by the basic concepts of probability theory including independence and various laws of large numbers. Next, measures in topological spaces are dealt with in some detail by the Daniell-Stone approach including weak convergence of measures. Here, the underlying spaces are mostly assumed to be Polish or, as in the treatment of compact sets of measures, locally compact with a countable base. After a chapter on Fourier analysis in finite-dimensional euclidean spaces, probability theory proper is taken up again: the Central Limit Theorem and related subjects, conditional expectations and Markovian kernels, and martingales. The last chapter is concerned with the elements of stochastic processes: the construction of the distribution of a process in some space of sample functions, the case of continuous sample functions, the definition of Markov processes and processes with independent increments, the Brownian motion and the Poisson process.

The book is extremely clearly and elegantly written, but sometimes slightly condensed. It seems to be very well suited for anyone with some experience in modern mathematics wishing to learn about either measure or probability theory.

K. Krickeberg

Functions of a complex variable (Constructive theory), by V.I. Smirnov and N.A. Lebedev. Iliffe Books Ltd., London. ix + 488 pages. U.K. 95 s. (net).

This book is an English translation of the Russian original Konstructivnaya Teoria Komplexnovo Premennovo, and is a welcome addition to the literature. Although there are many books in English on complex function theory, there are very few books in English known to the reviewer with similar subject matter. In particular we mention Walsh's book, Interpolation and Approximation by Rational Functions in the Complex Domain, [Colloq. Publ. A.M.S. Vol. 20, 2nd Edition, 1956].

The present work is divided into five chapters. Chapter I deals with the problem of uniform approximation of functions by polynomials and rational functions with special emphasis on those which interpolate a given function at certain suitable points. The Fekete points and Chebyshev points are introduced naturally at the proper place. It is refreshing to see a proof of Fejer's oft-quoted theorem that if f is regular and analytic in $|z| < 1$, continuous in $|z| \leq 1$, then the sequence of Lagrange interpolation polynomials on equidistant abscissae on $|z| = 1$ diverges at $z = 1$. The chapter closes with the proofs of well-known theorems of Mergelyan and Vitushkin. A brief mention of the names of American mathematicians Bishop, Vermer and Rudin, is also made.

Chapter II is devoted to the study of Faber polynomials and to the problem of representing a given function regular in a closed set B of the z-plane whose complement is a simply-connected domain. Chapter III treats mean square approximation on a domain and is devoted to a study of analytic functions which are orthogonal with respect to a domain. In Chapter IV the authors deal with functions which are orthogonal with respect to the boundary of a bounded simply connected domain, the boundary itself being a rectifiable Jordan curve.

The last chapter is concerned with problems of best uniform approximation and contains several interesting results which are generally spread out in Soviet journals.

Each chapter closes with a short note on "Supplemental Literature". In the list of references the titles of books and papers are translated into English leading the reader to believe that the books or papers were in English. Wherever such books or papers are available in English, a little effort on the part of the publishers to find this and to include this information in the references would have increased the value of the book. Thus Natanson's Constructive Theory of Functions has been included in the references, but its English translation is not mentioned. Also a reference of the A.M.S. translations of several results could be more helpful.

On the whole, the book is very readable and the printing is pleasant and