BOOK REVIEWS

Handbuch der Laplace-Transformation. Vol. 1. *Theorie der Laplace-Transformation.* By G. Doetsch. (Mathematische Reihe, vol. 14.) Basel, Birkhäuser, 1950. 15+581 pp.

The theory of the Laplace and of the Laplace-Stieltjes transforms is essentially a creation of the last thirty years though much of the theory may be said to be inspired by the somewhat older theory of Dirichlet series. The organization of the theory of Laplace-Stieltjes transforms some twenty odd years ago unified the theory of Dirichlet series with the much less developed theory of Laplace integrals and with the theory of analytic almost periodic functions. In the unified theory the Laplace transform

$$\mathcal{L}\{F\} = f(s) = \int_0^\infty e^{-st}F(t)dt$$

plays a preferred role owing to its importance for the applications. It enters in a natural manner in the theory of boundary value problems and much of the Heaviside Ars conjectandi can be rationalized by a judicious use of Laplace transforms. There are also close contacts with analytic function theory and with the theory of Fourier transforms. The Laplace transform would seem to be assured of a place in the sun for some time to come merely on the score of its wide range of applications.

Gustav Doetsch has devoted almost thirty years of his life to the theory of Laplace transforms and their applications to boundary value problems, especially for the heat equation. Since his connection with the Technological Institute of Stuttgart in 1924–31 he has always paid much attention to the applications and he seems to have kept close and mutually profitable contacts with engineers and physicists. He writes with an eye to this larger audience and he wants to be understood by people who have an immediate use for the results. Naturally, these are not always the results having significance, for instance, in the theory of locally compact groups, supposedly the standard of excellence in up-to-date analysis.

This is the author's fourth book on Laplace transforms. It was preceded by *Theorie und Anwendung der Laplace-Transformation,* Berlin, Springer, 1937, *Tabellen zur Laplace-Transformation und Anleitung zum Gebrauch,* Berlin and Göttingen, Springer, 1947, jointly with H. Kniess and D. Voelker, and *Die zweidimensionale Laplace-Transformation,* Basel, Birkhäuser, 1950 (volume 12 of the