BOOK REVIEWS

Linear operators. Part II. *Spectral theory.* By Nelson Dunford and Jacob T. Schwartz, with the assistance of William G. Bade and Robert G. Bartle. Interscience, New York, 1963. Pp. 859–1923. $35.

If a mathematical visitor from another century were to visit these shores and inquire about the present state of mathematical analysis, he would not miss much if he limited himself to leafing through the pages of this book. With the long awaited appearance of the second volume, we now see before our eyes a panoramic view, rich in colorful detail, of the whole output of a school of mathematical analysis that started with the work of Volterra and Fréchet near the turn of the century, and reached its peak in Poland, Hungary and the Soviet Union as well as at Chicago and Yale in the thirties and forties.

It is impossible to do justice to this volume by merely listing the contents, as has become customary in a review; we shall instead highlight some of the most valuable and typical parts, referring to Halmos's detailed review of the first volume for a description of the techniques of presentation of the material.

The guiding idea of the entire work is the spectral theory of a single linear operator, and its varied applications. Algebras of operators, specifically B^*-algebras, enter only in an ancillary function as aids in the proof of the spectral theorem, or as convolution algebras. This is all to the good, in view of the emphasis on concrete applications and special linear operators. It is rumored that von Neumann algebras and group representations are to be treated in detail in a separate volume by J. T. Schwartz anyway.

Chapter X, containing a proof of the spectral theorem, and probably written at an early stage, should be read by whoever wants to get the flavor of the exposition. The style is matter-of-fact in a pleasant no-nonsense way; it is a great improvement over certain excesses of rationalistic presentation with which we have become all too familiar. The overwhelming use of intricate notation, also an endemic vice of the day, is carefully avoided; one can open the book at almost any page and easily figure out the meaning of all symbols without having to trace it backwards ad infinitum. Theorems are seldom stated in their full stratospheric generality, but rather at that level where the typical application is to be found. A happy instance of this wise limitation is the treatment of multiplicity theory and spectral