

BOOK REVIEWS

Equations in Linear Spaces, by D. Przeworska-Rolewicz and S. Rolewicz. Polish Scientific Publishers, Warsaw, 1968, 380 pp. \$15.00; *Theory of Generalized Spectral Operators*, by Ion Colojoara and Ciprian Foiaş. Gordon and Breach, New York, 1968, xvi+232 pp. \$14.50; *Analyse harmonique des operateurs de l'espace de Hilbert*, by Bela Sz.-Nagy and Ciprian Foiaş. Masson, Paris, 1967, xi+373 pp.; *Introduction to the Theory of Linear Nonselfadjoint Operators*, by I. C. Goh'berg and M. G. Kreĭn. American Mathematical Society, Providence, 1969, xv+378 pp.

The theory of (mostly) bounded linear operators is the subject of the four books under review. None is, strictly speaking, a textbook; each is rather a monograph on an area of operator theory to which that pair of authors has contributed. The intersection of the books is small and the points of view quite different. All, but the second, present comparatively well-developed theories of recent origin and attempt to reach a wider audience than the specialist. The second book presents a tentative systematization of the rapidly growing study of generalized spectral theory. The last book is the first of three volumes of a very ambitious undertaking with the goal of presenting a large part of the work of the last two decades in operator theory to which the Russians have made crucial contributions.

The earliest results in operator theory were perhaps those attained by Volterra and Fredholm in the study of integral equations. After the extensive contributions of Hilbert, an abstract formulation of certain of the results concerning compact operators was given by F. Riesz in the so called "Fredholm alternative." Later, F. Noether showed using regularization that certain singular integral equations gave rise to Fredholm operators and proved the first "index theorem." The characterization of these operators as the operators which are invertible modulo the compact operators was given by Atkinson. Finally, a detailed and far reaching systematization of the study of this class of operators was made by Goh'berg and Kreĭn. It is mainly an exposition and refinement of this line of development with which the Rolewicz's' book is concerned.

As the title indicates the authors study the problem of solving the equation $Af=g$ for A a linear operator. Linear operators in linear spaces and especially nearly invertible operators or sets of operators are studied in the first third of the book. Algebraic operators are