with discontinuous coefficients and for systems of analytic functions. Also boundary value problems for systems of linear partial differential equations of elliptic type.

The final chapter involves some generalizations. For example a generalized Hilbert problem for several unknown functions and systems of singular integral equations for the case of contours with corner points is considered.

The long delay in the appearance of this book is regrettable. Particularly so, since a number of papers - some by the author - generalize and supplement the results of the monograph. In the preface the author gives a short account of these developments including an admirable bibliography.

H. P. Heinig, McMaster University.

Scattering Theory, by Peter D. Lax and Ralph S. Phillips. Academic Press (1967).

The main purpose of this text is to use a new approach to scattering theory for hyperbolic differential equations.

The authors deal with systems described by a group of unitary operators $\{U(t)\}$ acting on a Hilbert space H in which there are two distinguished subspaces D- and D+ with the property that as t varies from $-\infty$ to $+\infty$, the subspaces U(t)D- and U(t)D+ increase (decrease) monotonically from the zero subspace to the whole space H. With each subspace D- and D+ there is associated a special spectral representation of the group $\{U(t)\}$; in the one D- is represented by functions analytic in the lower half-plane, in the second D+ is represented by functions analytic in the upper half-plane. The two representations are related by a unitary operator-valued multiplicative factor $S(\sigma)$, $-\infty < \sigma < \infty$, called the scattering matrix.

The authors assume a knowledge of spectral theory, harmonic analysis, the theory of semi-groups and partial differential equations. The book contains applications to potential scattering, the Schrödinger equation and the acoustic equation with an indefinite energy form.

There are four appendices dealing with semi-groups of operators, energy decay, energy decay of star-shaped obstacles, and scattering theory for Maxwell's equations.

The text should be of great interest to mathematicians and theoretical physicists as it contains a lot of material which is highly original especially the authors' use of the Radon transform to give a new and more natural formulation of the Sommerfeld radiation condition which is also applicable to general hyperbolic equations.

C. Roth, McGill University.

Perturbation Methods in Applied Mathematics, by Julian D. Cole. Blaisdell Publishing Company, Waltham, Massachusetts, 1968. 260 pages. U.S.$9.50.

This book is concerned with perturbation techniques in the theory of differential equations, written from the point of view of an applied mathematician, i.e. little attention is given to mathematical rigor and physical reasoning is often used to justify steps in the analysis. The main mathematical tools used are asymptotic expansions in terms of a parameter and the idea of matching so called "inner" and "outer" expansions at a boundary layer.

Chapter one is a very brief introduction to asymptotic sequences and expansions.

Chapter two is concerned with singular perturbation problems