Studies in Real and Complex Analysis, by I.I. Hirschman, Jr., ed. Buffalo, The Mathematical Association of America, 1965. 213 pages. $4.00.

This little book, Volume 3 of the Association's "Studies in Mathematics" series, is a collection of seven articles on various areas of analysis. Directed mainly to readers at and beyond the first year graduate level, each article is (with perhaps the odd exception) well adapted to providing a pleasant introduction to the particular aspect of analysis with which it deals, and provides a reasonable starting point for further study.

Brief comments on individual contributions follow:

H. J. Bremermann, "Several Complex Variables". Starts at the most elementary level and quickly and effectively carries the reader to a discussion of such topics as: analogue of Runge's Theorem (for n complex variables), construction of meromorphic functions to locally given poles, local characterization of domains of holomorphy, the Theorem of Oka. There is a bibliography of 51 items.

L.M. Graves, "Nonlinear Mappings Between Banach Spaces". An exposition of some results on explicit function theorems in an abstract setting. Application of the theory to differential equations.

Einar Hille, "What is a Semi-group?" The discussion centers on one-parameter transformation semi-groups. Examples are given, indicating how these arise in various areas of analysis.

I.I. Hirschman and D.V. Widder. "The Laplace Transform, the Stieltjes transform, and Their Generalizations". The close parallel between power series and the Laplace-Stieltjes transform is dealt with at some length. The convolution transform. Schoenberg's theorems on variation - diminishing transforms. The operational calculus is used to derive striking inversion formulae for the Laplace and Stieltjes transforms.

H.H. Schaeffer, "A Brief Introduction to the Lebesgue-Stieltjes Integral". "The Lebesgue-Stieltjes Integral is defined for real-valued functions on n-dimensional euclidean space as the continuous extension of a linear form (viz., the Riemann-Stieltjes integral) on a vector lattice to its completion." (From the author's introduction).

Guido Weiss, "Harmonic Analysis". The L^1 and L^2 theories of Fourier series and integrals. The spectral synthesis problem. Some operators of harmonic analysis. Harmonic analysis on LCA groups. This article represents mathematical writing at its best.

Harold Widom, "Toeplitz Matrices." There are two types of Toeplitz matrices, those discussed here being matrices in which each diagonal has equal entries. To construct such a matrix, start with a

sequence. ..., c_{-2}, c_{-1}, c_0, c_1, c_2, ... (denoted c) and form the matrix $T_c = (a_{m,n})$, where $a_{m,n} = c_{m-n}$. If $a = (a_n)$ and $b = (b_n)$ are appropriately sized vectors, the problem considered here is to find the condition on c which ensures that the equation $T_c a = b$ can always be solved uniquely for a.

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Complex Variable Methods in Science and Technology, by John Cunningham. Van Nostrand Co. Ltd., London, Toronto, New York, Princeton, 1965. viii + 178 pages.

This book of 178 pages succeeds quite well in its main purpose "to provide students who are not primarily pure mathematicians with the basic tools of complex analysis for use in the theoretical study of physical problems" (author's preface). Another quotation "The author believes that the surest method of acquiring mathematical skills is to study examples and then try to apply the methods exemplified to fresh problems" is honestly fulfilled. The examples chosen are taken mostly from examination questions at five British (red-brick) universities. "Technology" in the title could be replaced by "Engineering" in the North-American context.

The listing of chapters shows that the author managed to compress the customary complex analysis material in small number of pages since the topics such as Real Variable Theory (chap.1), Improper Integrals (chap.6), Beta, Gamma and Delta Functions (chap.8) and Differential Equations (chap.9) are also included.

The text is well written; within the self-imposed limitations on rigor most statements are mathematically correct. Intuition and practical sureness are its dominant features. On this continent it can be used in most "applied mathematics" courses where in the hands of an experienced instructor the book can be useful, indeed.

V. Linis, University of Ottawa

A First Course in Partial Differential Equations, by H.F. Weinberger. Blaisdell Publishing Co., New York (Division of Ginn and Co.), 1965. ix + 446 pages.

One way of writing a text on partial differential equations is to assume a sound background in the standard topics of advanced calculus, Fourier series, Laplace transforms, and complex variables. Although the result may be elegant and compact, the student with minimal knowledge of these topics will find the going rather rough. An alternative approach, which is the one followed by the author, is to incorporate in a fairly substantial way this additional material. In the present book,