BOOK REVIEWS

Infinite series. By J. M. Hyslop. New York, Interscience, 1942. 120 pp. $1.75.

This textbook gives a concise presentation of the classic theory of convergence of real sequences and series. It is intended for students having had an elementary course in calculus. The brevity of the text precludes extensive motivation of the definitions and theorems, but numerous examples worked out in the text provide illumination. Problems, with answers given, appear at the end of each chapter.

Chapter 1 (17 pages) treats limits of functions by the ϵ-δ methods, and introduces the σ-O notation. Chapter 2 (7 pages) gives Taylor formulas, with remainders, for several elementary functions. Chapter 3 (11 pages) gives definitions, examples, and fundamental properties of convergence, including the Cauchy-sequence criterion. Chapter 4 (22 pages) gives the integral, comparison, ratio, Cauchy nth root (Cauchy condensation, sic), Kummer, and Raabe tests for convergence of series of nonnegative terms. For positive integers n, the Stirling formula $n! = (2n\pi)^{1/2}n^n e^{-n}[1+O(1/n)]$ is derived. Chapter 5 (10 pages) treats absolute and conditional convergence, giving the Abel and Dirichlet tests and Riemann's theorem on rearrangements. Chapter 6 (18 pages), on series of functions, treats uniform convergence, termwise integration and differentiation, and power series. Chapter 7 (7 pages) treats convergence of "the product series." The product series, defined without motivation, is that of Cauchy; one may feel that the author should have called the series by its familiar name so that the possibility of other interesting product series (Dirichlet, for example) would not be summarily dismissed. Chapter 8 (12 pages) treats infinite products, including those of the sine, cosine, and factorial (gamma) functions.

Chapter 9 (11 pages) treats double series. Summation "by triangles," "by squares," "by rows" and "by columns" are defined; to correct the formulation of the second of these definitions (p. 107, formula 2), replace N by k inside the parentheses and insert $\sum_{k=1}^{N}$ before the first parenthesis. The definition of convergence and divergence of a double series $\sum a_{mn}$ runs as follows: "Naturally, we wish our definition of the sum of a double series to conform as closely as possible to the definition of the sum of a single series. This analogy may be preserved by starting at the top left-hand corner of the array and taking successive groups of terms, where each group consists of only a finite number of terms of the series and contains all the ele-