BOOK REVIEWS

Typical means. By K. Chandrasekharan and S. Minakshisundaram. Oxford University Press, 1952. 10+140 pp. \$6.50.

This book, which is the first of a new series of monographs to be published under the auspices of the Tata Institute of Fundamental Research, Bombay, is concerned entirely with the theory and applications of Riesz summability. In view of the fact that Hardy's *Divergent series* devoted only a little space to Riesz summability, there was room for another book dealing more fully with this particular method. While reasonably complete, the book is not exhaustive; indeed, an account of everything that is known on the subject would be impossible in a book of this size. However, a useful series of notes at the end of each chapter contains numerous references, and also the statement of certain theorems for which room was not found in the main text. The book collects in a convenient form much material which has hitherto been available only in the original papers, and it should prove of great use to anyone who wants to work in this particular field. It is a pity that its usefulness should be diminished by the errors which occur in it.

In the remaining remarks, we use the following notation (which is in line with that used in the book). If $\{\lambda_n\}$ is any sequence of positive numbers increasing to infinity, and if $\sum a_n$ is any given series, we write

$$(1)\quad A(t) = A_\lambda(t) = \sum_{\lambda_\nu \leqq t} a_\nu;$$

$$(2)\quad A^k(t) = A_\lambda^k(t) = \sum_{\lambda_\nu \leqq t} (t - \lambda_\nu)^k a_\nu = k\int_0^t (t-\tau)^{k-1} A(\tau)d\tau \quad (k > 0);$$

$A_\lambda^k(t)$ is the Riesz sum, and $t^{-k}A_\lambda^k(t)$ the Riesz mean, of order k and type λ associated with the series $\sum a_n$. If $t^{-k}A_\lambda^k(t) \to s$ as $t \to \infty$, we say that the series is summable (λ, k) to s. [This is more usually termed summability $(R; \lambda, k)$, but as we are concerned only with Riesz summability there is no harm in omitting the "R."]

Apart from some introductory material, Chapter I deals, broadly speaking, with relations between Riesz means of the same type but different orders. Such topics as limitation theorems and M. Riesz's convexity theorem are dealt with adequately. There follows a section (§1.8) on Tauberian theorems. It may be remarked that this section deals only with those Tauberian theorems in which the hy-