account of the clarity of the exposition, the variety of its subject matter and the elegance in the presentation of what is sometimes rather cumbersome material. Most of them will deem it a privilege to have it on their shelves.

J. M. HYSLOP

SCHWARTZ, L., *Étude des sommes d'exponentielles* (Hermann, Paris, 1959), 152 pp., 1800 F.

This monograph, of considerable interest to the specialist, is a republication, somewhat revised, in three chapters of two works published separately in 1943.

Chapters I and III contain an investigation of the closed linear subspaces of $C(I)$ and $L^p(I)(1 \leqq p \leqq \infty)$ generated by sets of functions $\exp(-2\pi\lambda_\nu z)(\lambda_\nu \varepsilon \Lambda)$. Effectively the numbers λ_ν are real and I is an interval of the real axis (Chapter I) or imaginary axis (Chapter III): in the former case the subspace generated when the system is not total is completely characterised. Functiontheoretic applications are indicated including results on the location of singularities of functions represented in some sense by Dirichlet series.

The treatment involves a combination of transform theory and complex function-theory and is to some extent a development of methods introduced by R. E. A. C. Paley and N. Wiener, N. Levinson and V. Bernstein. Considerable use is made of an inequality for the coefficients, in representations by Dirichlet series, of the same general type as Mandelbrojt's " fundamental inequality ". An important innovation is the introduction of some of the "classical" methods and results of functional analysis, for example the representation of linear functionals on $L^p(I)$.

In the short Chapter II the author considers

$$N_p(k, n, \Lambda) = \operatorname*{Max}_{P} \frac{|a_k|}{\| P \|_{L^p(0, \infty)}}$$

where

$$P(x) = a_0 + \ldots + a_n e^{-2\pi\lambda_n x}.$$

The case $\lambda_n \equiv n$, $p = \infty$ was considered by S. Bernstein. It is shown that, as $n \to \infty$

$$\log N_p \sim 2\lambda_k \sum_{1}^{n} \lambda_p^{-1},$$

and conjectured (proved for $p = 2$) that

$$N_p \sim C_p(k, \Lambda) \exp\left\{2\lambda_k \sum_{1}^{n} \lambda_p^{-1}\right\}.$$

Since the original publication important related results have been obtained by the author and by A. F. Leonteev, S. Mandelbrojt, J. P. Kahane and others. Extra references and a regrettably very brief account of recent work have been added in the new edition.

M. E. NOBLE

MICHAL, A. D., *Le Calcul Différentiel dans les Espaces de Banach*, Tome I (Gauthier-Villars, Paris, 1958), translated by E. Mourier, xiv+150 pp., 70 F.

This book is concerned with the extension of the differential calculus to embrace functions which map one Banach space into another, the basic notion of differentiation being that of the Fréchet differential and the associated Fréchet-Michal derivative. It is based primarily on a series of papers published by the author over the last twenty years, and is the first of two volumes of which the English manuscripts were almost