

ples (2), verification (3), and finding an answer (4). No answers are given. There are no diagrams. A bibliography and an index of symbols are included. The typography is handsome, and the use of boldface and italic type helpful.

The authors are to be congratulated on an ambitious but successful undertaking. Their book is certain to be recognized as a valuable contribution to mathematical literature as both text and reference.

JOHN M. H. OLMSTED

*Grundlagen und Anwendungen der Informationstheorie.* By W. Meyer-Eppler. Kommunikation und Kybernetik in Einzeldarstellungen, vol. 1. Berlin-Göttingen-Heidelberg, Springer, 1959. 18+446 pp. DM 98.

Information theory has provided mathematics with a number of interesting problems and with at least one new idea (the Kolmogorov-Sinai invariant in ergodic theory). These matters will doubtless be of interest for some time to come; they may even find a permanent place on the mathematical scene. The volume under review, the first in Springer's new series on information and control, edited by Mr. Meyer-Eppler, covers most of the topics usually associated with the phrase *information theory* in its broadest meaning. The first six chapters treat Fourier analysis of signals, channels, communication in the presence of noise, and coding theory. The last four chapters deal with the sense organs as links in a communication channel, with optics and acoustics, and with structural linguistics. Since the mathematical treatment is casual, the reader hoping to come to grips with the analytic and probabilistic problems involved will be disappointed. On the other hand, he will find a clear account of the pre-mathematical ideas, together with a vast amount of illustrative material and a large number of interesting applications of information-theoretic notions to such subjects as phonetics and phonemic analysis, morphology, semantics, and the theory of vision. For those of us who are used to reading German in just one field, the book is hard to read because of the breadth of the subject-matter; a translation would find a wide audience.

PATRICK BILLINGSLEY

*An introduction to the geometry of numbers.* By J. W. S. Cassels. Grundlehren der mathematischen Wissenschaften, vol. 99. Berlin-Göttingen-Heidelberg, Springer, 1959. 7+344 pp. DM 64.50; bound, DM 69.

The geometry of numbers deals essentially with an arithmetical