for a property of the order-relation of a partially ordered set (rather than "anti-symmetric") and the symbol $<$ is used for this (reflexive) relation. The term "radius of rotation" on p. 297 is more commonly known here as "radius of gyration". In addition there are some infelicities such as the double meaning of $\Rightarrow$ on p. 124 and the poor layout of the table at the foot of p. 116, as well as a rather large collection of misprints (Pascal triangle on p. 132, omission of the word *no* on p. 249, line 6, reference to p. 000 on p. 356 and others).

The problems for solution (with sketch solutions) are thought-provoking and more open-ended than is usual in a mathematical textbook, but are none the worse for that.

The translation is pleasant and Mrs Silvey is obviously at home with her material although her use of "landing-net" on p. 191 shows that she is no trout-fisher.

M. PETERSON

LEKKERKERKER, C. G., *Geometry of Numbers* (North-Holland Publishing Company, 1969), 510 pp, 210s.

This book gives a systematic account of the present state of knowledge in what might be called the classical field of the geometry of numbers. Analogues of the geometry of numbers in spaces over the field of complex numbers, non-archimedean fields or the ring of adèles are not considered. Some indication of the topics and results included is obtained from the following brief list of some of the chapter and section headings: convex bodies; star bodies; lattices; theorems of Minkowski, Blichfeldt, Rédei and Hlawka, Mordell-Siegel-Hlawka-Rogers, and Macbeath; successive minima of convex bodies and of non-convex sets; reduction theory; inhomogeneous minima; polar reciprocal convex bodies; critical lattices; packings and coverings; the functions $\Delta(S)$, $T(S)$, $f(\Lambda)$, $g(\Lambda)$; reduction of automorphic star bodies; density functions; homogeneous forms; sums of powers and products of linear forms; extreme forms; asymmetric and one-sided inequalities; diophantine approximation. There are $32\frac{1}{2}$ pages of bibliography containing an almost complete list of work published in the field during the period 1935-1965. This has been arranged to knit well with the famous 1935 Ergebnisse report of Koksma. For this enormous task alone the author deserves grateful thanks from all workers in the field and all others interested in this beautiful piece of mathematics.

The author has shown considerable skill in organisation of the work, in selection of results and in choice of proofs. He has throughout emphasised geometric rather than arithmetic and analytic ideas. His historical notes and remarks on related work by various authors are interesting and illuminating. One slight point of criticism might be that in certain places these explanatory paragraphs tend to break the thread of the main development. This could have been avoided by having these paragraphs in different type. However, the book is essentially a text for specialists and they will not object to the undoubtedly heavy task of going through the work in detail.

All concerned with the production of this attractive and much needed volume deserve congratulations.

J. HUNTER

VAN DER WAERDEN, B. L., *Mathematical Statistics* (George Allen & Unwin Ltd., 1969), xi+367 pp., £7, 7s.

This is a translation into English of a book first published in German by Springer-Verlag in 1956. The translators are to be congratulated on the excellence of their work, since there is little if any indication that the book was not written originally in English.

It aims at presenting the mathematics underlying elementary statistical methods. The general methods of estimation discussed are least-squares, maximum-likelihood (including large sample properties) and minimum-chi-squared. Emphasis on test construction is laid on the chi-squared test and the generalised likelihood ratio test is not mentioned. Particular tests considered in some detail are, in their order of occurrence, Kolmogorov's test; t; F; the sign test; Wilcoxon's and the Fisher-Yates' tests. Estimators for which the relevant distribution calculus is given are, again in order of occurrence, sample quantiles; for normal samples, the mean and variance, the correlation coefficient and partial correlation coefficients; and Spearman's rank correlation coefficient. The theory of optimality considered is limited to the Gauss-Markov, Cramér-Rao and Rao-Blackwell theorems, and the Neyman-Pearson theory of hypothesis-testing. A somewhat austere account of probability and random variables is given in the first chapter. There is another chapter on mathematical tools, and a good one on the methods of bio-assay.

The book has a curious inconsistent quality. In some places, there is a complete lack of motivation; elsewhere motivation and illustrative examples are good. Proofs are sometimes complete, sometimes given for particular cases only, and sometimes the reader is referred elsewhere for the proofs of results which are stated. And this seems to occur in a very haphazard fashion. Topics of current interest are discussed alongside others which might now be generally regarded as part of the dead wood of the subject. The organisation of the material is unusual.

These and other inconsistencies make the book unsuitable as a modern textbook. However, it has one extremely good feature. The reader is kept constantly aware that statistics is an applied subject by illustrative examples containing real data and by valuable comments on the practical strengths and weaknesses of different methods. It is a good book for background reading.

S. D. SILVEY

OGG, A., *Modular Forms and Dirichlet Series* (W. A. Benjamin, Inc., New York, 1969), xviii + 173 pp., cloth $15, paper $6.95.

This book evolved from lecture notes given to graduate students at the University of California at Berkeley. It covers in six chapters all the basic results in Hecke's theory of modular forms and associated Dirichlet series and this in itself makes the book worth while, since reading the original papers in German is not an easy task.

Chapter I is a fairly long account of Hecke's work in Dirichlet series while Chapter II is short and contains an easily read discussion of the theory of Hecke Operators for the full modular group by defining them as correspondences on the set of lattices, as well as by the usual method. In the following chapter the author introduces the Petersson inner product on the space of cusp forms and uses it to prove that the (finite dimensional Hilbert) space of cusp forms has an orthogonal basis consisting of eigenfunctions for the ring of Hecke Operators. This is then extended in the next chapter when the subgroups of the modular group considered are congruence subgroups. A recent result due to A. Weil (1967) on the characterisation of modular forms of level N constitutes Chapter V, and finally, in Chapter VI the author touches upon the construction of modular forms of higher level by forming the theta series of positive definite integral quadratic forms.

In the interests of rapid publication this book was produced directly from typescript prepared by the author, who, in the words of the publisher, " takes full responsibility for its content and appearance ". While it must be universally agreed that the author is the person to decide which material should be included in his book, it is regrettable that the publisher himself has seen fit to abdicate his responsibilities concerning the appearance of the finished article and to leave it entirely in the hands of the author.