algebras with 1), a fact which the authors exploit by carrying out the discussion for any power-associative algebra. The reduction to simple algebras is made by means of associative linear forms and the radical is defined in terms of such forms. This leads to a speedy proof of the direct sum decomposition of semisimple algebras, valid for flexible strictly power-associative algebras of characteristic not two, although it postpones the task of actually finding associative forms. Such a form is obtained by looking at the trace of the right-multiplications, but the algebras have to be further restricted by a technical assumption, which is satisfied by Jordan algebras. This treatment enables the authors to cut down on formal calculations, which can so easily proliferate in this subject. However, it restricts the discussion to finite-dimensional algebras, and at times is rather hard to read because the definitions made are frequently not motivated until many pages later. This part, about two-fifths of the total, forms a concise introduction to finite-dimensional power-associative algebras.

The rest of the book concentrates on Jordan algebras, including a brief mention of the non-commutative and the characteristic-two case, but keeping to finite dimensionality throughout. It is shown that the theory developed so far is applicable, and in particular, that the group $\Pi(A)$ generated by the $P(x)$, for invertible x, acts transitively on the units. This emphasises the importance of isotopes, here called mutations, for in a Jordan algebra A, the elements of $\Pi(A)$ are essentially the autotopisms. Now follow some examples of special Jordan algebras; the exceptional case is dealt with in a separate chapter which also includes the basic facts on alternative algebras. There remains the classification of simple algebras. This is prefaced by a chapter on derivations and one on the Peirce decomposition relative to a complete system of idempotents. The structure theorem itself gives the classification of simple Jordan algebras over an algebraically closed field of characteristic not two. The book concludes with a brief treatment of formally-real Jordan algebras. The 15-page bibliography is fairly complete, not only on Jordan, but also on general non-associative algebras.

The authors have given an interesting and in many ways novel treatment of a difficult subject. Clearly the book is a " must " for anyone interested in Jordan algebras, although there are several topics which receive no mention: general Jordan rings, representation theory, Lie triple systems, applications to convex domains. Of these the reviewer regrets most the omission of the last one, about which the authors are particularly well qualified to write. Possibly they felt that this subject deserves a book to itself; this may well be so, and one hopes that it comes to be written soon.

P. M. COHN

GEL'FOND, A. O., AND LINNIK, YU. V., *Elementary Methods in the Analytic Theory of Numbers*, translated by D. E. Brown (Pergamon Press, 1966), xi+232 pp., 63s.

This is one of two translations into English of a book originally published in Russian in 1962, the other translation having been published in 1966 by Allen and Unwin; it seems regrettable to the reviewer that the work involved in a translation should have been duplicated in this way.

The stated and very worth-while aim of the book is to collect, systematise to some extent and simplify where possible solutions by elementary methods (that is, methods which do not use the theory of functions of a complex variable) of some of the problems of analytic number theory, and with this end in view the authors consider a wide collection of well-known problems. The twelve chapters of the book are on the following topics: 1. Additive properties of numbers, 2. Waring's problem, 3. The distribution of primes, 4. The law of distribution of Gaussian primes, 5. The sieve of Eratosthenes, 6. Atle Selberg's method, 7. The distribution of the fractional parts of numerical sequences, 8. Computation of the integral points within contours, 9. The distribution of power residues, 10. Hasse's theorem, 11. Siegel's theorem, 12. The transcendence of certain number classes. Almost all the chapters can be read independently of each other. Three of the chapters were written by contributors other than the authors: A. I. Vinogradov wrote chapters 5 and 6 and Yu. I. Manin contributed; chapter 10 of the remaining chapters 3 and 12 were written by Gel'fond, and Linnik wrote the rest. Some of the proofs given in this book originally appeared in the Russian literature, and thus will now be available to a greater number of readers. Much of the book would be too difficult for most British undergraduates, but any mathematician interested in number theory will find the book a useful addition to the literature.

Unfortunately this translation of the book is marred by a large number of misprints (most of which do not seem to occur in the other translation). Another irritating feature for the reader is the layout of some of the more complicated equations and inequalities; thus one finds in some places (such as in chapter 3, for instance, on p. 45) that the equality or inequality signs occur in the middle of a line but not at the beginning, so that an expression consisting of several terms is split between two lines when this could have been avoided at the expense of just a few extra pages to the book. The translation could be improved in a few places; an outstanding instance is the statement of Lemma 6 on p. 213, which does not make sense until it is rephrased!

E. J. SCOURFIELD

DUTTA, M., AND PAL, S. P., *Theory of Mathematical Probability and Statistics* (World Press, Calcutta, 1963), x + 162 pp., 21s.

Although this book appears to be a brief, clear treatment of well-chosen topics in elementary probability and statistics, it seems unlikely that it will displace the established texts, at any rate for British readers. (Brief mention)