14[65U05, 40A15, 65B10, 41A21].—K. O. Bowman & L. R. Shenton, *Continued Fractions in Statistical Applications*, Statistics: Textbooks and Monographs, Vol. 103, Dekker, New York, 1989, x + 330 pp., $23\frac{1}{2}$ cm. Price $89.75.

This book is a unique addition to the relatively small collection of books on continued fractions. It is also probably the only book devoted to the use of continued fractions in statistical applications. It presents a very readable and enticing account of the authors' extensive research involving application of continued fractions and Padé sequences to convergent and divergent series representations that occur in statistics. The emphasis throughout the book is on computational accuracy with modest computational resources. A valuable and unique feature of the book is that it points out the potential usefulness of computer algebra systems such as MACSYMA or REDUCE for obtaining expressions. Students will find the book very useful because many insightful comments are given as results are developed. Results are not just presented, but motivated and explained in a very personal style. The student reading through the many comments and examples will gain numerical analytic experience and knowledge that are usually only obtained through many hours or years of computational experiment.

The book is self-contained and incorporates the necessary results from many interesting references. It places a great amount of emphasis on the work of Stieltjes. It starts out with an introduction, using statistical examples, to continued fractions, summability theory, and the moment problem. These basic concepts are then successively extended to increasingly complex applications. Complete and computationally detailed examples are used extensively in the book and can serve as references for many applications in statistics. The book does not consider multivariate problems, as the authors found that there are many outstanding problems in the univariate situation. This book should be required reading for all statisticians, and will be informative reading for numerical analysts and engineers. For the mathematically inclined the book reads like a novel, a very good novel.

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15[62-04].—Pete Digby, Nick Galwey & Peter Lane, *Genstat 5: A Second Course*, Clarendon Press, Oxford, 1989, xi + 233 pp., $24\frac{1}{2}$ cm. Price $65.00 hardcover, $29.95 paperback.

This book is a follow-up to *Genstat 5–An Introduction* [1] . It introduces the use of GENSTAT for advanced statistical techniques that the program can carry out directly, and describes how to write procedures in the GENSTAT com-

mand language, enabling the user to define new commands in order to perform operations or analyses for which no canned software is available.

The advanced statistical techniques discussed include regression analysis of grouped data, nonlinear regression, analysis of experimental designs, analysis of contingency tables, principal component analysis, principal coordinate analysis, cluster analysis, and time series analysis.

Unfortunately, the book makes a common mistake of most introductions to the use of statistical software: it gives a pseudo-introduction to the statistical technique, instead of providing appropriate references to textbooks and explaining how GENSTAT can be used to do the numerical calculations. Everyone who has seen students "learn" statistics from an SPSS handbook knows what I mean. This is particularly evident in Chapter 5, entitled "The analysis of variation in several variables", where principal component analysis is introduced and illustrated in a way that will be incomprehensible to the novice, and redundant to those who know the basic notions on which the method is based. In contrast, the more technical chapters on how to write programs and procedures in the GENSTAT language appear to be readable and useful.

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1. Peter Lane, Nick Galwey & Norman Alvey, *Genstat 5–An Introduction*, Clarendon Press, Oxford, 1987. {Review 4, Math. Comp. **52** (1989), 252.}

16[94-01, 94Bxx, 05B05].—VERA PLESS, *Introduction to the Theory of Error-Correcting Codes*, 2nd ed., Wiley, New York, 1989, xiii + 201 pp., $23\frac{1}{2}$ cm. Price $34.95.

This is the second edition of a book which has already secured a prominent place in the textbook literature on algebraic coding theory. The attractive feature of the first edition, namely that of providing a leisurely introduction to the field which is at the same time mathematically rigorous, is again present here. New sections on BCH codes, on Reed-Muller codes, and on the binary Golay code have been added in the second edition, and the bibliography has been updated. There is a certain stress on cyclic codes, and there is ample material on self-dual codes, a subject that is apparently close to the heart of the author. An appendix contains the necessary background in linear algebra. The author manages to convey the beauty and the elegance of the subject, and she writes in an engaging style. The book can be strongly recommended as a course textbook and for self-study. My only criticism concerns the layout which is not optimal: for instance, on pp. 126–127 the statement of Theorem 80 is interrupted by Table 8.1, and