to this edition. The material has been somewhat rearranged and the computer drawn illustrations have been substantially enhanced making this an even more fascinating book to glance through.

The most serious defect of the earlier edition unfortunately remains. The fundamental concept of the book, Hausdorff dimension, is introduced in too abstract a way for an average undergraduate to absorb at a first reading. It would have been possible to provide a concrete approach to this unfamiliar concept had the raw numerical data of Richardson’s empirical studies of coastlines and boundaries been provided instead of a log log graph and an algebraic summary of his results.

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Cyclic groups are well understood. So it makes sense to use them as building blocks. The group $G$ is said to be polycyclic if it has a finite series of subgroups $1 = G_0 < G_1 < \ldots < G_{n-1} < G_n = G$ with each $G_{i+1}$ normal in $G_i$ and the factor group $G_i/G_{i-1}$ cyclic (finite or infinite).

Why is a monograph on this special aspect of group theory necessary? The answer lies in the tremendous expansion of the theory in recent years. In the case of polycyclic groups construction of the theory began with a series of papers by K. Hirsch, the first in 1938. Others who have made significant contributions are the Cambridge mathematician Philip Hall and the author himself.

It would be a pity if readers of the Gazette ignored this volume. It could be said that it approaches the upper limit of their range. But it is an excellent work, up-to-date, well organised and written with style and verve. The mathematics it contains is as interesting and important for its techniques as for its results.

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Having derived great benefit in the past from Introduction to the theory of statistics by Mood and Graybill, I was rather disappointed in the style of this book. In large measure it consists of a succession of theorems and their proofs, presented in a formal (and forbidding?) manner. There is some motivation of topics, but it is often minimal. Of course, linear algebra proofs are often of necessity rather lengthy. Also the author states that a prerequisite is to have had ‘one undergraduate course in matrix or linear algebra’.

The main aim of the book is to develop those matrix techniques of use in the areas of multivariate analysis and the linear model. The statistical applications presented are relatively few, the treatment usually being quite short; most of the book is concerned with a variety of advanced techniques in matrix and vector algebra. The first three chapters (of twelve), however, summarise the necessary ‘elementary’ ideas of matrix and vector theory, including basic work on eigenvalues and eigenvectors (here called ‘characteristic’ roots and vectors). (The author acknowledges that the material of the three chapters is to a large extent taken from Max Stein’s Introduction to Matrices and Determinants, the original intention having