MARJORAM, D. T. E., *Exercises in Modern Mathematics* (Pergamon Press, 1964), xiii+250 pp., 15s.

This book provides an elementary treatment of sets, logic, linear programming, scales of notation, groups, matrices, vectors, probability and statistics, and topology along with a plentiful supply of simple exercises on these topics. The very elementary standard sustained throughout the text and in the exercises would suit sixth-form pupils who have been reared on the more traditional school mathematics and who desire an elementary introduction to the above topics before leaving school.

However, there are blemishes in terminology which would be liable to confuse the reader unfamiliar with the basic ideas of abstract algebra. If these were corrected the book would be a useful introduction to some of the newer topics coming into school mathematics syllabuses. W. T. BLACKBURN

LINDLEY, D. V., *Introduction to Probability and Statistics from a Bayesian Viewpoint* (Cambridge University Press, 1965), Vol. I, xii+260 pp. 40s.; Vol. II, xiv+292 pp. 45s.

There is by now a fairly well established pattern for introductory books on probability and statistics. On the probability side, an axiomatic treatment of probability and some discussion of probability calculus is followed by a rather dull and unmotivated section on random variables and distributions which sets up the apparatus used later in inference problems. On the inference side there is more variability in presentation, depending on the emphasis which the author lays on principle and general methods as opposed to the derivation of the classical procedures, largely based on the assumption of normal distributions, which are still the most widely used tools of the practising statistician.

One might have expected Professor Lindley's book, written from the unorthodox Bayesian viewpoint, to have departed considerably from this traditional pattern and the immediate reaction is one of disappointment that it does not do so. One point of departure is the publication of the book in two volumes and it is convenient to treat these separately.

Part 1 deals with probability. Apart from a twelve-page section in the first chapter discussing probability as a degree of belief, and a final chapter on simple stochastic processes, this part follows very closely the traditional pattern outlined above. The axiomatic structure adopted is one based on conditional rather than absolute probabilities and the treatment of this is excellent. Axioms are well motivated and there is no measure-theoretic fuss which is irrelevant for a book at this mathematical level.

Chapters 2 and 3 which comprise the bulk of Part 1 are concerned with random variables and distributions and all the apparatus associated with these which is necessary in the subsequent study of statistics. Everything that one could reasonably expect is included here. The mathematical level adopted enforces the separate study of discrete and continuous cases, as no knowledge of measure theory is assumed. Explanations are careful and detailed. As mentioned above, this aspect of the subject tends to be rather dull and while the author has made some attempt to relieve the monotony of definition upon definition by the introduction of the Poisson process and the simple random walk, the overall impression left by this section is that it is extremely competent but unexciting.

The final chapter of Part 1 uses the apparatus previously developed in an introduction to stochastic processes, and includes discussion of immigration-emigration processes, queuing theory, renewal theory and Markov chains. This, of course, is basically much more interesting and it seems a good idea to include it as it helps to give point to Chapters 2 and 3. Again explanations are extremely clear and proofs easy to follow, so that this chapter provides an excellent introduction to the kinds of problem that arise in stochastic processes.

Whether or not one agrees that an introductory course on probability for undergraduates in mathematics should follow the pattern of Part 1 of Professor Lindley's book, there is no doubt that this part could be recommended to such students either by Bayesians or by non-Bayesians. An additional feature that is relevant in this context is the excellent set of examples at the end of each chapter.

The fact that the book is written from a Bayesian point of view does not affect Part I greatly. But the situation is quite different as regards Part II which is concerned with inference. This part remains traditional, indeed almost old-fashioned, in the sense that it is directed towards the derivation of the classical procedures in everyday use—tests and confidence intervals for normal means and variances, goodness-of-fit tests, etc., and it includes a discussion of the classical methods of maximum-likelihood and least squares. It is in the derivation and interpretation of these procedures that the Bayesian viewpoint makes itself felt. Prior distributions are chosen which give approximate agreement between orthodox and Bayesian solutions and while one can sympathise with the author's intention of reconciling Bayesian theory and standard practice, it does result in a certain degree of artificiality.

Is Part II a satisfactory introductory text on inference for the mathematics undergraduates at whom it is aimed? The reviewer certainly would not recommend it as such. This is not because of its unorthodoxy since the Bayesian viewpoint has many attractive features. But it treats a very limited and not very exciting aspect of the theoretical side of the subject, and while it is written in an extremely lucid style it leaves the impression that the subject is dull. S. D. SILVEY

MOORE, THERAL O., *Elementary General Topology* (Prentice-Hall), 174 pp., 48s.

It is reasonable to suggest that this book should succeed in its aim " to provide a systematic survey of the standard topics of general topology which the beginner can follow with minimum effort and maximum results ". I admit that I have doubts about the order of presentation. The general definition of a topological space comes virtually without warning, several pages before anything which could reasonably be described as motivation. Of course the order " general definitions first and explanations afterwards " is popular with many modern mathematical authors. It is true, as the present author claims, that early theorems are often easier when proved in full generality and that there is a real economy in doing the general case first and applying it afterwards. But I cannot help feeling that some beginners are bound to react against this treatment by saying " Yes, this is a very simple definition, but what is the point of it? ". Indeed, I feel that this is what the reaction *ought* to be. It is a pity that some of the statements on p. 72, which certainly help to rectify the situation, have not been placed earlier in the book.

I have no other adverse criticisms. Indeed, I wish to praise this book very highly. The material is presented in a most interesting fashion and one which should hold the attention of the diligent reader. Working through the text and doing all the exercises as they come should pay dividends. The author forces the reader to play an active part by persuading him to supply his own proofs of some of the standard results, but at the same time does include proofs, so that the reader is not left to flounder on his own. This is an excellent device and it is enhanced by the author's sympathetic asides.

Emphasis is placed in this book on those topics in Topology which are relevant to Mathematical Analysis. The first chapter is devoted to Elementary Set Theory, further items from which appear as they are needed later on. Topological Spaces are then introduced in full generality. The third Chapter is devoted to the idea of