mathematical rigor while ignoring the purpose for which these topics are meant.

Characteristic functions and generating functions, which are always a delight to the mathematics minded student, are conspicuous by their absence. The section on multivariate normal distributions somehow does not fit into the book. Topics like the analysis of variance are treated scrappily and no sufficient motivation for its inclusion is presented. On page 164 the author has a section on simple hypothesis vs. simple alternative. It is here that the term "simple" should be explained, but the disappointed reader does not get the meaning until he reaches page 183 where the terms "simple" and "composite" are defined.

A few misprints are found in the book. On page 32 line 7, $a \in [X \leq x - 2^{-m}]$ should read $w \in [X \leq x - 2^{-m}]$. On page 52 line 8, $y \leq \min \{n-x, r\}$ should read $y \leq \min \{n-x, w\}$.

Finally, the reviewer feels that the topics on random variables, the distinction between discrete and absolutely continuous distributions, and limit theorems have been treated exceedingly well and the author deserves praise.

V. Seshadri

The Essence of Biometry, by J. Stanley. McGill University Press, Montreal, 1963. xiii + 147 pages. $5.00.

This book addresses biologists; they will be pleasantly surprised to see how little and how elementary mathematics is required to understand the simple statistical techniques which form the basis of the methods applied in all but the most refined research in biology. They will derive satisfaction from the surprising amount of information such simple methods can extract from their data.

While the book contains nothing of interest for the mathematician, the reviewer feels that it should be read by statisticians. It teaches them by its own example the language they should use in the discussion of problems with practical biologists who had only little training in analysis and algebra.

In order to achieve these aims the author often employs unconventional notation and, warning the reader about his unorthodoxy, adheres consistently to his own grammar of formulae. It might be pointed out that the avoidance of the avoidance of the well established notation $\hat{}$ (hat) above parameter symbols denoting the estimators could be a handicap for further reading (mainly the book by C. R. Rao and papers by E. S. Pearson and E. J. G. Pitman). The unorthodoxy

in the notation appears excessive when the commonly known statistic "Students' t" (lower case t) is printed as T, as the latter symbol usually denotes a different (although related) statistic in more advanced biometrics ("Hotelling's T").

These, however, are minor blemishes of the book which on the whole must be considered as a valuable addition to statistical-biological literature.

F. E. Binet, C. S. I. R. O., Melbourne, Australia

Applied Dynamic Programming, by Richard E. Bellman and Stuart E. Dreyfus. Princeton University Press, Princeton, New Jersey, 1962. xxii + 363 pages.

Contents: One-dimensional allocation processes, multidimensional allocation processes, one-dimensional smoothing and scheduling processes, optimal search techniques, dynamic programming and the calculus of variations, optimal trajectories, multistage production processes utilizing complexes of industries, feedback control processes, linear equations and quadratic criteria, Markovian decision processes, numerical analysis. There are also five appendices: on a transcendental curve (O. Gross); a new approach to the duality theory of mathematical programming (S. Dreyfus and M. Freimer); a computational technique based on successive approximations in policy space (S. Dreyfus); on a new functional transform in analysis: the maximum transform (R. Bellman and W. Karush); the RAND Johnniac computer (S. Dreyfus).

Many readers will no doubt be familiar with the senior author's previous books on this subject: the basic Dynamic Programming (1957) and Adaptive Control Processes: A Guided Tour (1961), both published by Princeton University Press. During the past few years considerable effort has been devoted to exploiting the techniques of dynamic programming in a large variety of problems coming under the general heading of multi-stage processes. One of the major aims of the present work is to give detailed accounts of the application of dynamic programming techniques to the numerical solution of optimization problems. Computations were carried out on the RAND Johnniac computer.

The book contains a wealth of information which will be welcomed by the specialist. The authors' felicitous and unhurried style also makes the book eminently suitable as an introduction for those without previous knowledge of this subject. As we have come to expect from Bellman, each chapter terminates with some informative comments and a far-ranging bibliography. The publishers deserve praise for the excellent format.

H. Kaufman, McGill University