## BOOK REVIEW

Norman T. J. Bailey, *Statistical Methods in Biology*, 2nd ed., Halsted Press, John Wiley & Co., New York, 216 pp. index, $12.95 paperback.

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This very readable book presents a good basic discussion of many of the most commonly used basic statistical procedures. It would not be the most appropriate choice for a text in an elementary statistics course, owing to the lack of problems, but it would provide good supplemental reading. It has an informal discussion style that motivates the statistical methods well by giving specific biological settings calling for their use. Only the briefest mention of survey methods is included. The book is clearly intended for readers involved in experimental studies.

The book assumes some familiarity with biological contexts. Readers are also assumed to have some facility with arithmetic and algebraic manipulations. Factorials and exponentials are included in some formulas without explanation. In some examples, arithmetic is done using a coding of the original observations. This is not defined explicitly. Instead, mention is made of a "working origin" and of "working units," which are then uncoded to give the sample mean and standard deviation on the original scale of the data.

A strong point of the book is its introduction of the practical methods and formulas first, with later refinements developed for small sample sizes. Warnings about inappropriate data are frequent, with the advice that if complications arise the investigator should consult a professional statistician. An unusual suggestion is the use of Shepard's correction to the variance when calculated from grouped data. This is not often found and is generally an unnecessary complication. Also, the use of Yates' correction for two by two contingency tables is recommended, even though the most recent research on this somewhat controversial topic shows that this correction is overly conservative.

One serious omission is any discussion of power for hypothesis testing situations. This omission and the failure to at least define the standard Type I and Type II errors may leave some readers in difficulty in interpreting statistical results presented in other research. These omissions detract from an otherwise excellent discussion of the logic of statistical hypothesis testing.

The attention given to designs of experiments is to be commended. Rationales for various designs are clearly given, and the reader is led to consider the features of his experiment that would lead to the choice of an appropriate design. One desirable addition would be more discussion of pairwise comparisons and the concept of an experimentwise error rate.




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The distribution-free methods of Chapter 15 are related well to their parametric counterparts, although earlier reference to them as possible alternatives if the data do not meet the distributional assumptions of normal theory procedures might be helpful. The author restricts attention to hypothesis testing with distribution-free statistics, despite the fact that parameter estimation and confidence interval construction is straightforward and easily accomplished for all of the procedures mentioned in this book.

The compilation of statistical formulas, together with information describing each method, its uses and cautions, will make the text a very useful reference. The book is somewhat skimpy on statistical tables, but any serious user would need a separate book of tables in any event.

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