potheses which, had each been tested, would not have been rejected). They rely on resampling ideas as the way to check robustness, but do not directly discuss it. They worry about multiple testing and getting the degrees of freedom right in F-tests.

These methods have well-known deficiencies. Standard test statistics are consistent, which means that if the null hypothesis is false (and it almost always is), as the sample size grows ultimately the test will reject. Indeed, with a small sample size nothing is significant, with a large one everything is. They know this too (p. 259), but do not acknowledge the damage it does to their methods of inference. So what is being measured is sample size, for which we have much more direct information. Resampling is an interesting idea, but it relies heavily on independence. Resampling a time series, on the other hand, is not straightforward.

There are alternative methods (Bayesian) I think are better. I could go on and on about them; indeed I have (Kadane 2011). I think Bayesian methods come closer to "careful, logical, and correct reasoning."

Do I think, then, that Hubert and Wainer have written an unethical book? Not at all. The debate between sampling and Bayesian ideas has been going on for a long time, and I anticipate that it will, and should, continue. There is much to be learned from each other, and that communication is better pursued in an atmosphere of mutual respect.

Hubert and Wainer are very good in pointing out selection effects, missing variables in regression problems, and confounding in the context of legal cases, psychological studies, and medical and social applications. However, I am disappointed in their discussion of a meta-analysis showing slight effects of child sexual abuse on college students (p. 346 ff). If there are some abused youngsters who get over it, perform well, and get into college, and others who do not, it could be that abuse causes great harm but you would not observe it by studying abused college students.

I find the discussion of medical ethics perfunctory (Chapter 16), but the Horrigan "personal paper" (pp. 215–222) is startling and well worth thinking about. Horrigan's argument is that large clinical trials of rapidly lethal diseases are inherently unethical because the benefit to the patient is likely to be very small. The incentives to drug companies lead them to test drugs they control, even if the expected benefits are small, rather than common remedies that might have much larger benefits (and hence could be tested with smaller sample sizes). There is a serious ethical issue in the design of clinical trials in balancing the interests of the patients in the trial against those of patients treated after the trial is over. But this book sheds no new light on this issue.

As a scholarly work, I found the frequent references to Wikipedia to be unfortunate. No one signs these, and they reflect only the opinion of the last person to edit the entry. I counted 87 such references in the bibliography. In addition, there is a lot of reprinted material here. In places it reads more like a scrapbook than a statistics book.

Ethics is a specialized field characterized by people working just as hard and carefully as do statisticians. It is right for statisticians to criticize the errors made by those who are using statistics in faulty ways, and this book is full of such examples. It is also right for ethicists to demand the same respect for their field, and to oppose sloppy ethical reasoning by others.

In summary, I think this book is a useful adjunct to statistical courses aimed at behavioral, social, and clinical scientists. I also think that putting this book forward as a book about ethics was a mistake.

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REFERENCE

Kadane, J. (ed.) (2011), *Bayesian Methods and Ethics in a Clinical Trial Design*, New York: Wiley.

A Primer of Ecological Statistics, 2nd Edition.

Nicholas J. GOTELLI and Aaron M. ELLISON. Sunderland, MA: Sinauer Associates, 2012, xxi + 614 pp., $59.95 (P), ISBN: 978-1-605-35064-6.

The breadth and depth of quantitative and statistical training needed by ecologists continues to grow while undergraduate and graduate students entering the fields of biology and ecology often have relatively weak quantitative backgrounds. Many ecology-related degrees require only a single statistics course, leaving a wide gap between students' knowledge and what they need to know. Even recently graduated students identified their need to be exposed to a range of statistical approaches early in their training (Butcher et al. 2007).

Gotelli's and Ellison's book—written by ecologists with extensive experience teaching graduate and undergraduate statistics courses—helps fill this gap. The book is a stand-alone primer providing a practical introduction to probability theory, assumptions of hypothesis testing and statistical inference as well as typical ecological designs and analyses, without emphasizing the mathematical detail. I have found this book, aided by the very easy writing style of the authors, is equally well received by graduate and undergraduate students as a textbook in courses on ecological analyses, particularly when used as a bridge to more advanced books on specific topics. The book uses ecological data throughout, much of it collected by the authors, and all data are available on the book's web site, making it easy to use those data in labs. Students consistently find the appendix on matrix algebra useful.

The Primer is organized in four parts. Part I (Chapters 1–5) introduces the fundamentals of probability with chapters on probability, random variables and probability distributions, measures of location and spread, the framing and testing of hypotheses, and an overview of Monte Carlo, parametric, and Bayesian analyses. Part II (Chapters 6–8) addresses designing experiments with comprehensive chapters on designing field studies and experimental and sampling designs. Part III, on data analysis (Chapters 9–12), covers many forms of analysis of variance (ANOVA) as well as the analysis of categorical data and concludes with an overview of multivariate analyses.

These first three parts of the second edition are essentially identical to the first edition, with some redress of minor errors. The second edition, however, features a new "Part IV" (two chapters) on estimation. The themes of extrapolation and interpolation continue through the new material, as does the rich use of vignettes. Chapter 13 is a good introduction to estimation of species richness, rarefaction, and species density. Chapter 14 is about detecting populations and estimating their size. The chapter covers both occupancy models and mark–recapture models, with some discussion of extending these models in a hierarchical framework. Detecting populations and estimating their size is a field of much recent growth and the information in this chapter, particularly on occupancy, is a good (re)introduction to the topic. Both new chapters end with sections of available software.

With the addition of the new estimation chapters, it is unlikely that a single course would draw on all of the material in the second edition, but the book is more than just a potential textbook and the second edition extends the range of topics for which the reader is primed. Some of the criticisms of the first edition in terms of simplicity and approach remain in this edition—packages now easily handle unbalanced designs, mixed models can handle nested designs, missing data in block designs can be handled—but the book is an excellent primer to traditional methods in statistics and for designing experiments correctly from the outset. This book does a good job of helping practitioners understand one of the most difficult subjects for many ecologists.

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REFERENCE

Butcher, J. A., Groce, J. E., Litunia, C. M., Cocimano, M. C., Sanchez-Johnson, Y., Campomizzi, A. J., Pope, T. L., Reyna, K. S., and Knipps, A. C. S. (2007), "Persistent Controversy in Statistical Approaches in Wildlife Sciences: A Perspective of Students," *Journal of Wildlife Management*, 71, 2142–2144.

Statistics in Medicine, 3rd Edition.

Robert H. RIFFENBURGH. Waltham, MA: Academic Press, 2012, xlviii + 690 pp., $74.95 (H), ISBN: 978-0-123-84864-2.

The first two editions of *Statistics in Medicine* started with 10 chapters for a course of fundamentals and 16 more for a reference guide. In this third edition, the topics seem to be connected more closely and the contents flow better. Some structural changes from the second edition to the third edition are readily noticeable. The second edition started with "Data, Notation, and Some Basic Terms" in Chapter 1 and moved right into "Distributions" in Chapter 2 while