dissection as a procedure in treating breast cancer. The chapter on chronic disease modeling also discusses breast cancer.

The book provides a lot of text before giving mathematical statements for the Bayesian methods. It also pays adequate attention to computing considerations. The case studies emanate from the author's experiences in graduate study and university consulting.

REFERENCES

Webster, R., and Oliver, M. (2001), *Geostatistics for Environmental Scientists*, Chichester, UK: Wiley.

Ziegel, E. (2001), Editor's Report on *Geostatistics for Environmental Scientists*, by R. Webster and M. Oliver, *Technometrics*, 43, 499.

Multilevel Modelling of Health Statistics, edited by A. H. LEYLAND and H. GOLDSTEIN, New York: Wiley, 2001, ISBN 0-471-99890-7, xvii + 217 pp., $95.00.

In the Preface the editors note that "early application of multilevel modeling tended to be concerned with educational and social rather than health data" (p. xi). This book is a collection of chapters that intended to be "a self-contained general reference for graduate and higher-level courses for those with a knowledge of basic regression modeling" (ibid.). Each chapter focuses on practical applications in the health sciences.

The book comprises 12 chapters. Multilevel models are introduced in Chapter 1, where the author characterizes the applicable data structures as "multilevel or hierarchical." The familiar application of repeated measures and longitudinal data is the focus of Chapter 2. Chapters 3 and 4 consider situations in which the response measurements are not continuous. The methodology is further expanded into multivariate generalizations in Chapter 5. Diagnostics for all of these models are discussed in Chapter 6.

The book's second half deals with various extensions, applications, and supporting methodology. Chapter subjects include modeling, nonhierarchical structures, multinomial regression, modeling of institutional performance, applications in spatial analysis, sampling and study design, meta-analysis, and modeling for survival data. A final chapter discusses the use of software. Most of the software comes from specialized programs, but there is also a presentation of the multilevel capabilities in the BMDP (5-V) and SAS (PROC MIXED) software systems. Overall, this is a very readable book whose audience does not seem to be limited to statisticians.

Applied Statistics in the Pharmaceutical Industry, edited by Steven MILLARD and Andreas KRAUSE, New York: Springer-Verlag, 2002, 0-387-98814-9, xviii + 513 pp., $79.95.

This is a book of chapters written by different authors. The book is organized into seven parts that successively move the statistical applications from basic pharmaceutical research through all levels of clinical testing and steps in regulatory approval to large-scale manufacturing. It covers the application of statistics to the complete life cycle of the drug development process. In the Preface the editors state that "Statisticians are involved in every phase of this process; between the years 1960 and 2000, the number of statisticians working in the pharmaceutical industry grew from less than 100 to over 2500." The industry is certainly the focus of many of the current developments in applied industrial statistics, as well as the source of most of the good jobs.

Subtitled *With Case Studies Using S-PLUS*, the book had its origin in a short course taught at Merck Research Laboratories. (This may explain why Merck's people were so disdainful about my being a SAS user during my visit a couple of years ago for a job interview.) The two editors have excellent pedigrees for this task. One editor co-authored the book by Millard and Neerchal (1998), one of the significant S-PLUS applications textbooks. This author also was the developer of the environmental statistics module in S-PLUS (see Lumley 2001 for a review). The other editor is one of the authors of the text by Krause and Olson (2000), an excellent introduction to the use of S-PLUS in statistical computing (see Ziegel 2001 for a report on the second edition).

Part 1 (Chap. 1) of the book provides an overview of the use of statistics in the drug development process. Part 2 (Chap. 2) discusses the use of statistics in preclinical one-factor comparative studies. This chapter was written by Merck statistician Bill Pikounis. Part 3 comprises two chapters on preclinical safety assessment, both of which are concerned with animal studies. Part 4, covering Phase I studies, makes up more than one-third of the book and comprises six chapters devoted to the design, analysis, and presentation of results for Phase I trials. Equally long is Part 5, Phase II and Phase III Clinical Trials. Two of this part's six chapters deal with sample size calculations. Additional chapter topics include treatment comparisons, permutation tests, meta-analyses, and even a comparison of doing ANOVA using SAS and S-PLUS. The author of this chapter concludes that "there's no reason not to use S-PLUS for ANOVA models, and a few reasons you should."

Part 6 comprises a single chapter on health economic data. Two chapters on manufacturing and production conclude. One of these deals with the use of sterilization processes, and the other is concerned with acceptance sampling. The book was written before the release of Version 6 of S-PLUS and is focused entirely on the use of the S-PLUS language. Presumably one can carry out many of the analyses using the GUI interface in Version 6, the best single reason to become an S-PLUS user.

REFERENCES

Krause, A., and Olson, M. (2000), *The Basics of S and S-PLUS* (2nd ed.), New York: Springer-Verlag.

Lumley, T. (2001), Review of *Environmental Statistics With S-PLUS*, by S. Millard and N. Neerchal, *Technometrics*, 43, 495.

Millard, S., and Neerchal, N. (1998), *Environmental Statistics With S-PLUS*, Boca Raton, FL: CRC Press.

Ziegel, E. (2001), Editor's Report on *The Basics of S and S-PLUS* (2nd ed.), by A. Krause and M. Olson, *Technometrics*, 43, 249.

The Ultimate Six Sigma, by Keki R. BHOTE, New York: AMACOM, 2002, ISBN 0-8144-0677-7, xxxvi + 404 pp., $99.95.

Readers of my numerous reports on Six Sigma books will have learned that the text by Pande et al. (2000) (reported in Ziegel 2002), has been the "ultimate" Six Sigma book that I have found. The subtitle for this new book, *Beyond Quality Excellence to Total Business Excellence*, indicates that the word "ultimate" has a somewhat different context here. Readers of my reports may also recall that I was not complimentary about one of this author's previous books (Bhote and Bhote 2000, reported in Ziegel 2001), which claims to have found the "ultimate" design of experiments methodology.

Although this text is burdened with the price of a technical book, there is plenty of the hype of a popular business book on the jacket. "Unveils a radical expansion of applications," "known worldwide as one of the fathers of the Six Sigma model," and especially "consultant emeritus at Motorola" were my favorites. Now I have a new career goal at BP. The author did get former Motorola CEO Robert Galvin to write a Foreword claiming that Bhote has "more than 400 companies as his worldwide clients" (p. xxii). Galvin describes the thrust of the book as "excellence beyond product quality." He did not mention why my Motorola stock is only worth about 20% of its former value.

The author notes in the Preface (p. xxvi) that "the Ultimate Six Sigma was launched as an alternative, both to the venerable Motorola Six Sigma and the machinations of certain Six Sigma consultants." In his opening quote to his first chapter, he talks about "Six Sigma Houdinis" (p. 3). In Chapter 4, one encounters "The Hyped Six Sigma: From the Pure Six Sigma to the Sick Six Sigma." "Hyped" is a euphemism for the programs of any of the other Six Sigma consultants. The hyperbole of the Motorola story and the critical evaluation of Six Sigma actually create interesting and informative chapters in the first part of the book.

The author differentiates the Ultimate Six Sigma as not being as limited as conventional Six Sigma, which "stops at quality," "is limited to customer satisfaction," and "concentrates primarily on product" (p. 46). That has never been my perception, although I am not part of a Six Sigma organization. Bhote has 12 focus areas: customer, leadership, organization, employees, measurement, tools for the 21st century, design, supply chain management, manufacturing, field operations, support services, and primary results. It all sounds like "same-old same-old" to me.

The remaining 80% of the book contains one chapter on each area. There is much good reading here, and it is certainly beneficial, if not always entertaining, for any Six Sigma aficionado to consider this author's



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