

# Short Book Reviews

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Editor Dr. A.M. Herzberg

## REVIEWS

STATISTICIANS OF THE CENTURIES. C.C. Heyde and E. Seneta (Eds.). P. Crépel, S.E. Fienberg and J. Gani (Associate Eds.). New York: Springer-Verlag, 2001, pp. xii + 500, US\$45.95/DM100.00.

### Contents:

- Alphabetical listing of statisticians
- 16th century (1 entry)
- 17th century (7 entries)
- 18th century (10 entries)
- 19th century (32 entries)
- 20th century (54 entries)

Readership: Very general

This book arose out of an International Statistical Institute initiative. Its objective is stated to be to demonstrate the achievement of statistics to a broad audience and to commemorate the work of celebrated statisticians. This demanding objective has been outstandingly well met. The choice of individuals for inclusion, taken from those born before 31 December 1900, has been wisely wide-ranging and includes individuals like Keynes and Hurst, who would be thought of as an economist and a civil engineer respectively, but whose work had an important and influential statistical component. Most entries have a photograph, a very short abstract and typically a four or five page essay, although a few are longer, followed by a short bibliography. The essays are lucid, informative, sympathetic to their subject (there are no hatchet jobs) and most contain a pleasing mixture of technical and personal detail. The editorial team and the contributors are to be congratulated on an important and enjoyable contribution to the general literature on our subject.

Nuffield College  
Oxford, U.K.

D.R. Cox

WEIGHING THE ODDS. A COURSE IN PROBABILITY AND STATISTICS. D. Williams. Cambridge University Press, 2001, pp.xvii + 547, £70.00/US\$100.00Cloth; £24.95/US\$37.95 Paper.

### Contents:

1. Introduction
2. Events and probabilities
3. Random variables, means and variances
4. Conditioning and independence
5. Generating functions; and the central limit theorem
6. Confidence intervals for one-parameter models
7. Conditional pdfs and multi-parameter Bayesian statistics

8. Linear models, ANOVA, etc.
9. Some further probability
10. Quantum probability and quantum computing

APPENDIX A: Some Prerequisites and Addenda  
APPENDIX B: Discussion of Some Selected Exercises  
APPENDIX C: Tables  
APPENDIX D: A Small Sample of the Literature

Readership: Students of the subject who need a coherent framework to develop elementary methods to extend and broaden their knowledge; mathematicians who seek a serious formal introduction to the subject with real-world motivation

This is an excellent mathematical introduction to its subject and I am somewhat envious that I was myself trained on a rather more classical diet! The exercises and motivating examples here are extremely thought provoking and the author is refreshingly honest in addressing controversial issues and points of difficulty. The range is very large - from the 'law of average' and 'car and goats' to gambling, martingales and a whole chapter on quantum computing, for which previous knowledge of quantum theory is not assumed.

The developing role of computer packages in applications to real data is recognized, but the author warns against the dangers of over-elaboration in modelling that can result from being seduced by modern computational efficiency. The style of the book is very attractive and the book has been very well produced.

Imperial College of Science,  
Technology and Medicine  
London, U.K.

F.H. Berkshire

CHAOTIC ELECTIONS! D.G. Saari. Providence, Rhode Island: American Mathematical Society, 2001, pp.xiii + 159.

### Contents:

1. A mess of an election
2. Voter preferences, or the procedure?
3. Chaotic election outcomes
4. How to be strategic
5. What do the voters want?
6. Other procedures; Other assumptions

Readership: Everyone who does, or should, vote (about anything)

It has often been said that 'the voters are always right' and likewise that 'the trouble with

democracy is that you do not know who is going to win.' The difficulty is that there are paradoxes and problems associated with voting and other aggregation procedures, which have been addressed by mathematicians since the eighteenth century. One surprising and disturbing feature is that such procedures can be sensitive to small changes in individual votes or procedures associated in dynamics with the concept of chaos.

The author is well known for research in problems of Newtonian dynamics (the 'gravitational n-body problem') and his interest in voting systems began as a 'hobby'. However, this evidently turned into an obsession and also gave him a promotional device to attract mathematicians into the social sciences.

This book has a particular purpose: to explain even to a general reader, with only a modest mathematical background, what can go wrong in elections/gradings, and why. There are examples galore and naturally the year 2000 US Presidential election exerts a brutal, but very entertaining, fascination. It is disturbing that, for all the interplay among the counts, courts, re-counts, chads and defective ballots, the real problem is with the voting system itself.

They may always be 'right', but mathematics identifies what the phrase 'what the voters really want' might mean and how to set up a voting method, which produces the right outcome. This book is great and important reading for all - not only for the citizens of Florida.

Imperial College of Science,  
Technology and Medicine  
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F.H. Berkshire

PROBABILITY AND RANDOM PROCESSES, 3rd edition.

G. Grimmett and D. Stirzaker. Oxford University Press,  
2001, pp. xii + 596, £60.00 Cloth; £29.95 Paper.

Contents:

1. Events and their probabilities
2. Random variables and their distributions
3. Discrete random variables
4. Continuous random variables
5. Generating functions and their applications
6. Markov chains
7. Convergence of random variables
8. Random processes
9. Stationary processes
10. Renewals
11. Queues
12. Martingales
13. Diffusion processes

Readership: Advanced undergraduates, postgraduates  
and researchers in applied probability and  
statistics

This is a new edition of a textbook that since its first edition has been my first port of call for clarification and recall of definitions and proofs in probability and stochastic processes [[Short Book Reviews](#), Vol. 13, p.4]. This new edition includes new sections on sampling, MCMC, coupling, geometrical probability, spatial Poisson processes, renewal-reward, queueing networks, stochastic calculus, and option pricing in the Black-Scholes model, as well as more than four hundred new exercises. We are given no more than brief introductions to these new topics, but they will prove valuable to readers already in possession of the previous edition, showing as they do how these advanced topics may be presented at

an intermediate level. I recommend this book wholeheartedly.

Imperial College of Science,  
Technology and Medicine  
London, U.K.

R. Coleman

ONE THOUSAND EXERCISES IN PROBABILITY.

G. Grimmett and D. Stirzaker. Oxford University Press,  
2001, pp. x + 438, £27.50 Paper.

Contents:

1. Events and their probabilities
2. Random variables and their distributions
3. Discrete random variables
4. Continuous random variables
5. Generating functions and their applications
6. Markov chains
7. Convergence of random variables
8. Random processes
9. Stationary processes
10. Renewals
11. Queues
12. Martingales
13. Diffusion processes

Readership: Advanced undergraduates, postgraduates  
and researchers in applied probability and  
statistics

This is an enlargement of the authors' earlier book *Probability and Random Processes: Problems and Solutions*, which gave all the exercises and solutions for the second edition of their *Probability and Random Processes*. This does the same for its third edition. The first one hundred and thirty-three pages give the exercises and problems, the remaining three hundred pages their solutions. Clearly there is no room for more than directions and answers, so we need have no fear from the fallout resulting from the book getting into the hands of students. Indeed, converting the "easily seen that" into model answers will offer sufficient challenge. The authors themselves acknowledge having found some of their problems rather tricky.

Imperial Collage of Science,  
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R. Coleman

PRINCIPLES OF DATA MINING. D. Hand, H. Mannila and

P. Smyth. Cambridge Massachusetts: MIT Press, 2001,  
pp. xxxii + 546, US\$50.00/£34.95.

Contents:

1. Introduction
2. Measurement and data
3. Visualizing and exploring data
4. Data analysis and uncertainty
5. A systematic overview of data mining algorithms
6. Models and patterns
7. Score functions for data mining algorithms
8. Search and optimization methods
9. Descriptive modeling
10. Predictive modeling for classification
11. Predictive modeling for regression
12. Data organization and databases
13. Finding patterns and rules
14. Retrieval by content

APPENDIX: Random Variables

Readership: Applied statisticians, computer scientists, upper-year undergraduate students, first or second-year graduate students

Data mining is the science of extracting useful information from large sets of data or databases. It encompasses several disciplines: statistics, machine learning, pattern recognition, databases and artificial intelligence. This very good book is one of the first inter-disciplinary approaches to the area, with the authors' areas of expertise spanning statistics, databases and computer science. The book takes a modular approach, focusing separately on model structure, score functions, optimization and data management. After considering these areas, specific data mining tasks are discussed. These include clustering, regression, and classification, and the less (statistically) familiar topics of finding patterns and retrieval by context. From the statistical perspective, much of the material is familiar, amounting to exploratory and adaptive modeling techniques for very large sets of data. One of the exciting things about data mining (and this book) is its interdisciplinary nature.

University of Waterloo  
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H.A. Chipman

THE ELEMENTS OF STATISTICAL LEARNING. T. Hastie, R. Tibshirani and J. Friedman. New York: Springer-Verlag, 2001, pp.xvi + 533, US\$74.95/DM159.90.

Contents:

1. Introduction
2. Overview of supervised learning
3. Linear methods for regression
4. Linear methods for classification
5. Basis expansions and regularization
6. Kernel methods
7. Model assessment and selection
8. Model inference and averaging
9. Additive models, trees, and related methods
10. Boosting and additive trees
11. Neural networks
12. Support vector machines and flexible discriminants
13. Prototype methods and nearest neighbors
14. Unsupervised learning

Readership: Students of statistics, data analysis, data mining and machine learning, and anyone who wishes an accessible, clear and authoritative introduction to these areas

This book describes modern tools for data analysis. With the exception of the last chapter, it is concerned with 'supervised' methods - those methods in which a sample of cases is available, including values of an outcome variable, and on which one can build a model allowing one to predict the value of the outcome variable for new cases. The authors are amongst the leaders in this area, having developed many of the modern tools. Such methods have seen extraordinary development in recent decades, primarily because of progress in computer technology, but also because of the huge range of applications. Furthermore, the practical development of these modeling and inferential tools has resulted in a deeper theoretical understanding of the modeling process. The (72 page) last chapter of the book describes unsupervised methods, which model distribution without being told known values of some outcome variable.

The book includes many special cases and examples, which give insights into the ideas and methods. It explains very clearly the relationships between the methods, and covers both standard statistical staples, such as linear and logistic regression, as well as modern tools. It is not overburdened with unnecessary mathematics but uses only what is necessary for the practical application of the methods.

The index is fairly brief, and does not do justice to a book covering such a range of ideas. There are exercises at the end of each chapter, although these are primarily of a theoretical rather than a data analytic nature. The book would make an ideal course text, but would need to be supplemented by practical details of how to use software tools to implement the methods (such as, for example, S-plus or R).

The book has been beautifully produced. It was a pleasure to read. I strongly recommend it.

Imperial College of Science,  
Technology and Medicine  
London, U.K.

D.J.Hand

CAUSALITY: MODELS REASONING AND INFERENCE.

J. Pearl. Cambridge University Press, 2001, pp. xvi + 384, £25.00/US\$39.95.

Contents:

1. Introduction to probabilities, graphs and causal models
2. A theory of inferred causation
3. Causal diagrams and the identification of causal effects
4. Actions, plans and direct effects
5. Causality and structural models in social science and economics
6. Simpson's paradox, confounding and collapsibility
7. The logic of structure based counterfactuals
8. Imperfect experiments; Bounding effects and counterfactuals
9. Probability of causation: interpretation and identification
10. The actual cause

Epilogue: The art and science of cause and effect

Readership: Artificial intelligence researchers, cognitive scientists, social scientists, statisticians

Causality is a complex and contested notion. This book does two things: it provides a brief, historical overview and offers intelligent, pragmatic help for researchers. It will particularly help clarify the thoughts of researchers in fields who are struggling to make sense of messy, noisy environments and need tools and reassurance. As Pearl writes in the context of visual preception (p.60), "How safe are our predictions...? ...Not absolutely safe, but good enough to tell a tree from a house...." That is not a purist view, but it is an intensely practical one and necessary as a way of making a first cut description. Pearl's chapter on counterfactuals is perhaps the most important for those not expert in the topic (Chapter 7), providing a clear account of the underlying logic. Indeed, concepts and reasoning are explained with great care throughout. The Epilogue, which is also a summary and can usefully be read first, is highly entertaining, reflecting the author's generally confident and outgoing approach.

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B. Farbey

THEORIE DES SONDAGES: Echantillonnage et estimation en population finie. Y. Tillé. Paris: Dunod, 2001, pp. xii + 284.

Table des matières:

1. Introduction
2. Une histoire des idées en théorie des sondages
3. Les fondements de la théorie des sondages
4. Plans simples
5. Plans à probabilités inégales
6. Echantillonnage par scission et estimation de variance
7. Stratification
8. Plans équilibrés
9. Plans par grappes, à plusieurs degrés et à deux phases
10. Estimation avec informations auxiliaires et plans simples
11. Estimation avec informations auxiliaires et plans complexes
12. Estimation de variance par linéarisation
13. Traitements des non-réponses

Readership: Étudiants de deuxième cycle en mathématiques et sciences appliquées

Ce livre trouve ses origines dans des notes de cours pour étudiants mais beaucoup de nouveaux résultats de recherche ont été ajoutés. Il est encore toujours intéressant pour utiliser dans l'enseignement, surtout grâce aux exercices (avec solutions). Le sujet de l'ouvrage est très intéressant en actuel: la théorie des sondages, les méthodes d'estimation des paramètres et le traitement des non-réponses. Le niveau de l'ouvrage est relativement mathématique mais grâce à une bibliographie excellente, beaucoup de détails techniques ont été écartés du texte.

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N.D.C. Veraverbeke

THE BAYESIAN CHOICE. From Decision-Theoretic Foundations to Computational Implementation, 2nd edition. C.P. Robert. New York: Springer-Verlag, 2001, pp. xxiii + 604, US\$79.95/DM183.00.

Contents:

1. Introduction
2. Decision-theoretic foundations
3. From prior information to prior distributions
4. Bayesian point estimation
5. Tests and confidence regions
6. Bayesian calculations
7. Model choice
8. Admissibility and complete classes
9. Invariance, Haar measures, and equivariant estimators
10. Hierarchical and empirical Bayes extensions
11. A defense of the Bayesian choice

Readership: Undergraduate and postgraduate students of Bayesian statistics

The first edition [Short Book Reviews, Vol. 15, p.27] of this book was a translation, by the author, of his book in French, and this second expanded edition advances from an introductory level to cover recent work in the Bayesian area. The text reads fluently and beautifully throughout, with light, good-humoured touches that warm the reader without being intrusive. There are many examples and exercises, some of which draw out the essence of the work of other authors. Each

chapter ends with a "Notes" section containing further brief descriptions of research papers. A reference section lists about eight hundred and sixty references. Each chapter begins with a quotation from *The Wheel of Time* a sequence of books by Robert Jordan. Only a few displays and equations have numbers attached. This is an extremely fine, exceptional text of the highest quality.

University of Wisconsin  
Madison, U.S.A.

N.R. Draper

SUBJECTIVE PROBABILITY MODELS FOR LIFETIMES.

F. Spizzichino. Boca Raton, Florida: Chapman and Hall/CRC 2001, pp. xx + 248, £39.99/US\$59.95.

Contents:

1. Exchangeability and subjective probability
2. Exchangeable lifetimes
3. Some concepts of dependence and aging
4. Bayesian models of aging
5. Bayesian decisions, orderings, and majorization

Readership: Academia (Statistics and Operational Research, Biostatistics, Epidemiology), Industry (Reliability Research)

The book reflects a fairly committed type of Bayesian approach, for example, 'any unknown quantity is treated as a random variable' (Preface). The level is postgraduate in that it assumes a background in calculus of several variables, probability at an intermediate level, basic elements of stochastic processes, etc. (Preface). The style is fairly mathematical, punctuated throughout by Definition, Remark, Proposition, Example, Lemma and Theorem. That said, there is also much clear and helpful explanation of concepts. The material is mainly theoretical - one will not find practical analyses of data sets here. Each chapter ends with Exercises and Bibliography, which will be particularly useful for research students.

Imperial College of Science,  
Technology and Medicine  
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M. Crowder

BAYESIAN SURVIVAL ANALYSIS. J.G. Ibrahim, M.H. Chen and D. Sinha. New York: Springer-Verlag, 2001, pp. xiv + 479, US\$79.95/DM183.00.

Contents:

1. Introduction
2. Parametric models
3. Semiparametric models
4. Frailty models
5. Cure rate models
6. Model comparison
7. Joint models for longitudinal and survival data
8. Missing covariate data
9. Design and monitoring of randomized clinical trials
10. Other topics

Readership: Graduate students in biostatistics and statistics

The analysis of time-to-event data arises naturally in many fields of study. This book focuses exclusively on medicine and public health but the methods presented can be applied in a number of other areas, including biology, economics and engineering.

Although several previously published texts address survival analysis from a frequentist perspective, this book examines solely Bayesian approaches to survival analysis. Recent advances in computing and

practical methods for prior elicitation have now made Bayesian survival analysis of complex models feasible. This book provides a comprehensive and modern treatment of the subject. In addition, the authors demonstrate the use of the statistical package BUGS for several of the models and methodologies discussed in the book. The authors provide a collection of theoretical and applied problems in the exercises at the end of each chapter. Whilst BUGS is a very useful software package, there are a number of ways in which it might be extended and the authors discuss some of these towards the end of the book.

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C.M. O'Brien

CLASSICAL COMPETING RISKS. M.J. Crowder. Boca Raton: Chapman and Hall/CRC, 2001, pp. iii + 186.

Contents:

1. Continuous failure times and their causes
2. Parametric likelihood inference
3. Latent failure times: Probability distributions
4. Likelihood functions for univariate survival data
5. Discrete failure times in competing risks
6. Hazard-based methods for continuous failure times
7. Latent failure times: Identifiability crises
8. Martingale counting processes in survival data

APPENDIX A: Numerical Maximisation of Likelihood Functions

APPENDIX B: Bayesian Computation

Readership: Statisticians, engineers, scientists

This short book gives an excellent self-contained treatment of competing risks and performance of survival analysis. The coverage is quite comprehensive, with parametric, nonparametric, and semi-parametric methods discussed and illustrated on a variety of sets of data from the literature. The chapter on identifiability issues collects results, which are not much discussed in other books on survival analysis. Finally, the book is fun to read, with occasional outbreaks of breezy style and references to sages such as Sherlock Holmes and Peter Sellers.

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J.F. Lawless

REGRESSION BASICS. L.H. Kahane. Thousand Oaks, California: Sage, 2001, pp. xi + 202, £21.00.

Contents:

1. An introduction to the linear regression model
2. The least-squares estimation method: Fitting lines to data
3. Model performance and evaluation
4. Multiple regression analysis
5. Non-linear, dummy, interaction and time variables
6. Some common problems in regression analysis
7. Where to go from HERE

Readership: Regression beginners in econometrics

The Sage publishing philosophy appears to be one of taking a subject (like regression analysis, for example) and splitting it up into many small pieces. This is one such small piece; the book "comes to an end" on page 138 and the Appendices follow. It is written by an economist, as a simple introductory manual and "is intended to be a companion to a more comprehensive

textbook", which seeks to demonstrate the value of regression in research. It refers to twenty-six other publications in a reference list: ten papers, nine other Sage books, and seven more books, mostly econometrics oriented. There are twenty exercises. The narrow vision of this book is both its main virtue and its major drawback.

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Madison, U.S.A.

N.R. Draper

ADVANCED LINEAR MODELING. Multivariate, Time Series, and Spatial Data; Nonparametric Regression and Response Surface Maximization. R. Christensen. New York: Springer-Verlag, 2001, pp. xii + 398, US\$79.95/DM182.00.

Contents:

1. Multivariate linear models
2. Discrimination and allocation
3. Principal components and factor analysis
4. Frequency analysis of time series
5. Time domain analysis
6. Linear models for spatial data: Kriging
7. Nonparametric regression
8. Response surface maximization

Readership: Mathematical statisticians

This book is the second edition of *Linear Models for Multivariate, Time Series and Spatial Data* (1991) (Short Book Reviews 11, p.47). The main change is the addition of Chapter 7 on nonparametric regression (orthogonal series approximations, splines, regression trees... and Chapter 8 on response surface maximization. The emphasis in this work is on the linear model theory, which unifies three major fields in statistics: multivariate analysis, time series and spatial data. Most chapters end with a selection of exercises, which makes the book also interesting for teaching purposes.

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N.D.C. Veraverbeke

ANALYSIS OF MESSY DATA. Volume III. Analysis of Covariance. G.A. Milliken and D.E. Johnson. Boca Raton, Florida: Chapman and Hall/CRC, 2002, pp. xv + 605, US\$69.95/£46.99.

Contents:

1. Introduction to the analysis of covariance
2. One-way analysis of covariance - one covariate in a completely randomized design structure
3. Examples for Chapter 2
4. Multiple covariates in a one way treatment structure in a completely randomized design structure
5. Two-way treatment structure and analysis of covariance in a completely randomized design structure
6. Beta-hat models
7. Variable selection in the analysis of covariance model
8. Comparing models for several treatments
9. Two treatments in a randomized complete block design structure
10. More than two treatments in a blocked design structure
11. Covariate measured on the block in RCB and incomplete block design structures
12. Random effects models with covariates

13. Mixed models
14. Analysis of covariance models with heterogeneous errors
15. Analysis of covariance for split-plot and strip-plot design structures
16. Analysis of covariance for repeated measure designs
17. Analysis of covariance for nonreplicated experiments
18. Special applications of analysis of covariance

Readership: Applied statisticians, experimenters, graduate students

This is the authors' third *Analysis of Messy Data* volume, following on from their 1984 Volume 1 [[Short Book Reviews](#), Vol. 5, p. 18] and their 1989 Volume 2 [[Short Book Reviews](#), Vol. 9, p.21]. We owe them a huge debt for their twenty-five years (since they began writing) of persistence. As with the previous volumes, the authors go systematically and solidly through their material, in this volume analysis of covariance. Their displays rely mostly on the SAS<sup>R</sup> system software, with a leavening of JMP<sup>R</sup> tables. This should not deter users of other systems who will easily follow and adapt what they see. A few references are given at the end of each chapter, but there is no collected bibliography. The data in most of the examples "were generated to simulate real world applications that we have encountered in our consulting experiences." Each chapter has a few exercises. The book as a whole has many sets of data. In the years to come, many consulting statisticians will say to their clients, "Why don't we see what Milliken and Johnson have to say on that?" as they pull this book from their shelves.

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Madison, U.S.A.

N.R. Draper

MEASUREMENT ERROR AND LATENT VARIABLES IN  
ECONOMETRICS. T. Wansbeek and E. Meijer.  
Amsterdam: Elsevier, 2000, pp. xii + 440,  
NLG195.00/EURO88.49/US\$102.00.

Contents:

1. Introduction
2. Regression and measurement error
3. Bounds on the parameters
4. Identification
5. Consistent adjusted least squares
6. Instrumental variables
7. Factor analysis and related methods
8. Structural equation models
9. Generalized method of moments
10. Model evaluation
11. Nonlinear latent variable models

Readership: Econometricians, government statisticians, graduate econometrics students and researchers in regression modelling

This text presents a unified approach to dealing with two apparently different problems resulting in regressor variables being unobservable. These two kinds of 'unobservable' variables are those that are subject to measurement error or 'noise', possibly introduced as part of the data collection process, and latent variables, these are conceptual or idealistic variables that cannot be measured directly. The book begins with a discussion of what goes wrong, in the sense of inconsistency of the estimators, when regressors in a multiple regression

model are subject to error. This is recognized as an identification problem where no consistent estimator may exist. The use of additional information to enable the development of reliable consistent estimators and the construction of instruments from the available data are covered in Chapters 5 and 6. These ideas are extended to the multiple equations setting through the use of factor analysis models in Chapter 7. The important general class of structural equation models and the use of the generalized method of moments form the basis of later chapters. Polynomial models and non-linear models with ordered categorical variables are considered in the final chapter.

The approach relies heavily on the extensive use of matrix algebra as associated with fitting linear regression models and on the statistical results involved particularly with the distributions of quadratic forms. Most of the required results in algebra, calculus and statistics are brought together in two detailed appendices. Each chapter concludes with an interesting set of bibliographical notes that ties up any loose ends and identifies sources of additional material. Relatively few numerical examples are included but there is an extensive thirty-four-page list of references.

University of Southampton  
Southampton, U.K.

P. Prescott

THE ECONOMETRIC ANALYSIS OF SEASONAL TIME  
SERIES. E. Ghysels and D.R. Osborn.  
Cambridge University Press, 2001, pp. xxi + 228,  
£4750/US\$69.95 Cloth; £17.95/US\$24.95 Paper.

Contents:

1. Introduction to seasonal processes
  2. Deterministic seasonality
  3. Seasonal unit root processes
  4. Seasonal adjustment programs
  5. Estimation and hypothesis testing with unfiltered and filtered data
  6. Periodic processes
  7. Some non-linear seasonal models
- Epilogue

Readership: Economists, government statisticians, advanced graduate students

The book contains recent developments in the theory and practice of seasonal adjustment. The authors describe various test procedures for unit root models and compared these procedures by Monte Carlo methods. This is a very useful book for economists and econometricians working in this area who are interested to learn all the up-to-date methods. My only criticism with this book is that the authors did not illustrate the techniques with a large number of real time series. One feels that the book is written for theoreticians rather than for practitioners.

University of Manchester Institute of  
Science and Technology  
Manchester, U.K.

T. Subba Rao

MULTIVARIATE ANALYSIS OF QUALITY, AN  
INTRODUCTION. H. Martens and M. Martens.  
Chichester: Wiley, 2001, pp. xx + 445, £85.00.

Contents:

- PART I: Overview  
PART II: Methodology

PART III: Applications  
PART IV: Appendices

Readership: Chemometricians, food scientists,  
sensometricians, data analysts

Traditional multivariate analysis deals predominantly with "tall thin" data matrices having more individuals than variables. Computerized measurements as found in chemometrics, food science, sensory studies and related areas, however, produce "short fat" data matrices having many more variables than individuals. Traditional methods often hit problems with such matrices, so a numerical approach termed *soft modelling* has been popularized in these areas. Central to this approach is the bi-linear model, with iterative partial least squares and cross-validation, which provides the tools for estimation and assessment.

This book presents a wide-ranging account of these methods. While certainly of general interest to statisticians, its main target is the research scientist working in these substantive areas. There is extensive discussion of design and experimentation issues as well as those of analysis. The authors adopt an application-driven, user-friendly and graphically oriented presentation, with most technical mathematics relegated to the appendices. It should prove a very useful text for this target readership.

University of Exeter  
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W.J. Krzanowski

ANALYSIS OF TIME SERIES STRUCTURE. SSA AND RELATED TECHNIQUES. N. Golyandina, V. Nekrutkin and A. Zhigljavsky. Boca Raton, Florida: Chapman and Hall/CRC, 2001, pp. xi + 305, US\$79.95/£49.99.

Contents:

- Introduction
- PART I
  1. Basic SSA
  2. SSA forecasting
  3. SSA detection of structural changes
- PART II: SSA Theory
  4. Singular value decomposition
  5. Time series of finite rank
  6. SVD for stationary series

Readership: Statisticians, graduate students of statistics, econometricists, multivariate analysts

"Singular-Spectrum Analysis" (SSA) offers an intriguing view of time series analysis and forecasting developed mainly by physicists and meteorologists. It is an approach that is different from the traditional Box-Jenkins and spectral (frequency domain) methods familiar to statisticians.

Part I is devoted entirely to illustrating the theory by detailed analyses of a number of time series by SSA. The examples include some well-known series such as the sunspot data. Each example illustrates some special features. The practical choices which have to be made when applying the theory are discussed. The explanations give much insight into the method.

In Part II the formal mathematical theory, which underpins the method, is laid out with admirable clarity. The authors have performed a service to the statistical community by writing this book. It is likely to become

the standard reference to SSA; helpful to the applied statistician who wishes to analyse a times series and also to the theoretician who may wish to develop this interesting approach to time series analysis further.

University of Cape Town  
Rondebosch, South Africa

J.M. Juritz

MULTIVARIATE PERMUTATION TESTS: WITH APPLICATIONS IN BIostatISTICS. F. Pesarin. Chichester, U.K.: Wiley, 2001, pp. xxvi + 408, £55.00.

Contents:

1. Introduction
2. Discussion of a simple testing problem
3. Theory of permutation tests for one-sample problems
4. Examples of univariate multi-sample problems
5. Theory of permutation tests for multi-sample problems
6. Nonparametric combination methodology
7. Examples of nonparametric combination
8. Permutation analysis in factorial designs
9. Permutation testing with missing data
10. The Behrens-Fisher permutation problem
11. Permutation testing for repeated measurements
12. Further applications

Readership: Professional statisticians, graduate students, researchers and practitioners facing complex testing problems

This text carefully presents a concise and mathematically rigorous treatment of permutation testing in univariate and multivariate situations. In the Introduction, the author points out that there are two approaches to the construction of permutation tests; the first is the heuristic or intuitive approach, which is often used for simple problems; the second is based on the concept of conditioning with respect to a set of sufficient statistics in the null hypothesis. The basic ideas are introduced through a simple two-sample testing problem. More involved problems are developed in subsequent chapters, each illustrated with practical examples and concluding with a set of exercises. Later chapters deal with quite complex problems including the use of synchronized tests in factorial designs and the discussion of permutation testing in situations, such as repeated measures analyses, longitudinal studies, the analysis of panel data and response trajectories, which can be re-presented as multivariate problems.

The computationally intensive methods are carried out using conditional Monte Carlo (CMC) methods. Programs and macros for these methods, suitable for running in SAS and S-Plus, together with a demonstration copy of NPC Test 2.0 and all the data sets used in the text, are available from the Internet.

The text could be used for a mathematically orientated graduate class but it is more likely that the book will form a source of recent reference material for research workers in the area of permutation testing. Many of the references, twenty-seven pages in all, are to publications within the last two or three years.

University of Southampton  
Southampton, U.K.

P.Prescott

STATISTICAL METHODS IN BIOINFORMATICS - AN INTRODUCTION. W.J. Ewens and G.R. Grant, New York: Springer-Verlag, 2001, pp. xix + 475, US\$79.95/DM177.00.

Contents:

1. Probability theory (i): One random variable
2. Probability theory (ii): Many random variables
3. Statistics (i): An introduction to statistical inference
4. Stochastic processes (i): Poisson process and Markov chains
5. The analysis of one DNA sequence
6. The analysis of multiple DNA or protein sequences
7. Stochastic processes (ii): Random walks
8. Statistics (ii): Classical estimation and hypothesis testing
9. BLAST
10. Stochastic processes (iii): Markov chains
11. Hidden Markov chains
12. Computationally intensive methods
13. Evolutionary models
14. Phylogenetic tree estimation

APPENDIX A: Basic Notions in Biology

APPENDIX B: Mathematical Formulae

APPENDIX C: Computational Aspects of the Binomial and Generalized Geometric Distribution Function

APPENDIX D: Sum of Normalized Scores

Readership: Biostatisticians and statisticians who want to learn about bioinformatics

The book is self-contained and even includes a few pieces from calculus. The first four chapters are a solid introduction to basic probability theory, stochastic processes and statistics. The material is well seasoned with examples and problems related to genetics. Starting with Chapter 6, the authors focus their efforts on modeling and DNA and protein sequences. Often they digress (Chapters 7 and 8, for instance) towards mathematical statistics with the strong emphasis on numerical techniques. The software package BLAST is the most cited item but I have failed to satisfy my curiosity and to find the origin of the acronym.

The book is a very substantial and highly professional contribution to bioinformatics and applied statistics.

GlaxoSmithkline  
Collegeville, U.S.A.

V.V. Fedorov

SAMPLING AND MONITORING IN CROP PROTECTION.

M.R. Binns, J.P. Nyrop and W. van der Werf. Wallingford, U.K., CABI Publishing, 2000, pp. xi + 284, US\$90.00/£49.95.

Contents:

1. Basic concepts of decision-making in pest management
2. Basic concepts of sampling for pest management
3. Classifying pest density
4. Distributions
5. Sequential sampling for classification
6. Enhancing and evaluating the usefulness of sampling plans
7. Binomial counts
8. Multiple sources of variation
9. Resampling to evaluate the properties of sampling plans
10. Sampling over time to classify or estimate a population growth curve

11. Monitoring pest populations through time

Readership: Graduates and final-year undergraduates in pest management

There are pests in your fields. You go out into those fields and sample the pests. You study your data. You decide to (a) do nothing; (b) introduce, or reintroduce, natural enemies; (c) apply a pesticide; (d) wait and take another sample soon. Or you (e) realize that, before you went out into the fields, you should have consulted this book. The correct decision is, of course (e), after which you can dispense with choice (e). To appreciate this volume, you will need some statistical knowledge, basic college mathematics, some knowledge of pests and crops, and the ability to work with computer software made available as electronic chapters on the Internet. The authors have succeeded in producing an excellent, workmanlike volume that takes account of recent literature on these topics.

University of Wisconsin  
Madison, U.S.A.

N.R. Draper

WAHRSCHEINLICHKEITSTHEORIE UND STATISTIK.

A. Irie. Stuttgart: Teubner, 2001, pp. 378, DM62.00/ÖS453.00/S.F.54.50.

Contents:

1. Zufallsexperimente
2. Wahrscheinlichkeitsräume
3. Umgang mit Wahrscheinlichkeiten
4. Bedingte Wahrscheinlichkeiten
5. Diskrete Wahrscheinlichkeitsmasse
6. Reelle Wahrscheinlichkeitsmasse
7. Zufallsvariablen
8. Erwartungswerte und Integrale
9. Momente und Ungleichungen
10. Stochastische Unabhängigkeit
11. Gesetze der grossen Zahlen
12. Der zentrale Grenzwertsatz
13. Die statistische Modellbildung
14. Statistisches Entscheiden
15. Zur Struktur statistischer Experimente
16. Optimale Schätzer
17. Das lineare Modell
18. Maximum-Likelihood-Schätzung
19. Optimale Tests
20. Spezielle Tests und Konfidenzbereiche

Readership: Undergraduate students in mathematics and engineering

The first twelve chapters of this book give a classical introduction to probability theory, starting from Kolmogorov's axioms and ending with the strong law of large numbers and central limit theorem. The next eight chapters provide an introduction to statistical inference with discussion of optimality of estimators and tests. An interesting feature of the book is that each chapter is split up in two parts. In the first part, the main concepts, methods and examples are given. The second parts give a more in-depth study of certain aspects, usually involving more mathematical techniques. The book is well suited as a textbook for a first course at a good level. Unfortunately there are no exercises included in the text.

Limburgs Universitair Centrum  
Diepenbeek, Belgium

N.D.C. Veraverbeke

STATISTICAL INFERENCE, 2nd edition. G. Casella and R.L. Berger. Pacific Grove, California: Duxbury, 2001, pp. xxviii + 660.

Contents:

1. Probability theory
2. Transformations and expectations
3. Common families of distributions
4. Multiple random variables
5. Properties of a random sample
6. Principles of data reduction
7. Point estimation
8. Hypotheses testing
9. Interval estimation
10. Asymptotic evaluations
11. Analysis of variance and regression
12. Regression models

Readership: Probabilists, statisticians, teachers, students

This is most welcome second edition of an already popular book that emphasizes usefulness while keeping a distinct level of rigour in the development. Compared to the first edition there is more emphasis on computing aspects and at the same time more applicable techniques have been expanded. Many special features make this a fine book to have on one's desk. There are some three hundred examples sprinkled all over the manuscript. More than one hundred pages of exercises of varying degrees of difficulty are included. Each chapter ends with a section titled miscellanea that guides the reader to relevant aspects not covered in the book but hinted at in the extensive bibliography. This is a re-freshing book that can be strongly recommended to students as well as to teachers.

Katholieke Universiteit Leuven  
Heverlee, Belgium

J.L. Teugels

#### FUNDAMENTALS OF MODERN STATISTICAL

METHODS: Substantially Improving Power and Accuracy.  
R.R. Wilcox. New York: Springer-Verlag, 2001, pp.xiii + 258, US\$49.95.

Contents:

1. Introduction
2. Getting started
3. The normal curve and outlier detection
4. Accuracy and inference
5. Hypothesis testing and small sample sizes
6. The bootstrap
7. A fundamental problem
8. Robust measures of location
9. Inferences about robust measures of location
10. Measures of association
11. Robust regression
12. Alternate strategies

Readership: Applied researchers interested in current day statistical methods

This book tries to bridge the gap between state-of-the-art statistical methods *versus* techniques commonly used. The first part of the manuscript covers Chapters 2 to 7 and is non-mathematical. It provides a verbal and graphical explanation of why standard statistical methods can be highly misleading. At the same time, an intuitive understanding of the practical advantage of modern techniques is highlighted. In the second part, the author describes a subset of modern

techniques that are usually only covered in high-level publications; by this token, these techniques and their advantages remain hardly accessible to an applied, but non-statistically trained, researcher. By data from actual studies, many examples are included to illustrate the practical problems with conventional procedures and how more modern methods can make a substantial difference in the conclusions reached in many areas of statistical research.

Katholieke Universiteit Leuven  
Heverlee, Belgium

J.L. Teugels

#### MODELLING AND QUANTITATIVE METHODS IN

FISHERIES. M. Haddon. Boca Raton, Florida: Chapman and Hall/CRC, 2001, pp. xvi + 406, US\$69.95/£29.99.

Contents:

1. Fisheries, population dynamics, and modelling
2. Simple population models
3. Model parameter estimation
4. Computer intensive methods
5. Randomization tests
6. Statistical bootstrap methods
7. Monte Carlo modelling
8. Growth of individuals
9. Stock-recruitment relationships
10. Surplus production models
11. Age-structured models

Readership: Students of undergraduate courses in biology, marine ecology and statistics

This book has been produced from a series of short and intensive courses on modelling and quantitative methods that the author has given at fisheries laboratories and universities around Australia.

The main objective of the book is to provide a text that details the analytical methods currently being used in quantitative biology and fisheries science. I might disagree with this as risk assessment receives only a cursory mention. In contrast, age-structured models are explained in simple terms but the exposition suffers from a lack of recent references to the published literature.

A major aim of the author was to focus on the details of how to perform the analyses described but this has been at the expense of an integrated development of the subject matter. The text does include Microsoft Excel workbooks relating to each example and problem discussed. Undoubtedly, this will assist the novice but will be of annoyance to the more experienced practitioner.

The book would be greatly enhanced by the addition of an author index; this would enable the inquiring student to pursue a course of independent study.

CEFAS Lowestoft Laboratory  
Lowestoft, U.K.

C.M. O'Brien

#### MAXIMUM PENALIZED LIKELIHOOD ESTIMATION.

Volume I: Density Estimation. P.P.B. Eggermont and V.N. LaRiccia. New York: Springer-Verlag, 2001, pp. xvii + 510, US\$84.95/DM196.00.

Contents:

- PART I: Parametric Estimation  
PART II: Nonparametric Estimation  
PART III: Convexity

Readership: Graduate students and researchers in statistics

This is the first volume in a two-part project on maximum penalized likelihood estimation. It deals with parametric and nonparametric density estimation and also with convex estimation. The theoretical chapters give a detailed account of asymptotic properties (consistency, rates of convergence asymptotic normality,...), optimality properties, computational aspects and band-width choice. The mathematical level is quite high, but most of the required tools, like martingales, exponential inequalities, Fourier analysis, Banach spaces, etc. are explained in the text. An interesting feature of the book is also that each part ends with an "in action" chapter in which the estimation procedures are put to work and small sample performance is discussed. The book can be used for classes and seminars, particularly because of the presence of numerous exercises and tasks.

Limburgs Universitair Centrum  
Diepenbeek, Belgium

N.D.C. Veraverbeke

STATISTICAL TECHNIQUES IN BIOASSAY, 2nd revised and enlarged edition. Z. Govindarajulu. Basel: Karger, 2001, pp. xvii + 234, SwFr. 98.00/DM127.00/ US\$85.25.

Contents:

1. Introduction
2. Preliminaries
3. Algebraic dose-response relationships
4. The logit approach
5. Other methods of estimating the parameters
6. The angular response curve and other topics
7. Estimation of points on the quantal response function
8. Sequential up and down methods
9. Estimation of 'Safe Doses'
10. Bayesian bioassay
11. Radioimmunoassays
12. Sequential estimation of the mean logistic response function

Readership: Experimental scientists, statisticians

This is a revised and enlarged version of the 1988 edition [Short Book Reviews, Vol. 9, p.3]. The scope is wide, though there is no detailed coverage of robust methods, nor of overdispersion, and little material on times to response, especially with regard to the material of Chapters 8 - 11, and historical work. It is claimed that readers only need a basic course in inference, but there is much algebraic detail. There are only five figures, with the first not appearing until page 119. It is curious that the first mention of GLIM is not until page 95, and there appears to be no explicit mention of generalized linear models; the sole reference to Gibbs sampling is an aside on the last page of Chapter 10. More guidance, more selection, and less detail would have resulted in a book that was less encyclopedic, but probably more practically useful.

University of Kent  
Canterbury, U.K.

B.J.T. Morgan

EXPERIMENTAL DESIGN WITH APPLICATIONS IN MANAGEMENT, ENGINEERING, AND THE SCIENCES. P.D. Berger and R.E. Maurer. Belmont, California: Wadsworth/Thomson Learning, 2002, pp. xvi + 480.

Contents:

- PART I: Primary Focus on Factors Under Study  
PART II: Primary Focus on the Number of Levels of a Factor

PART III: Response-Surface Methods, Other Topics, and the Literature of Experimental Design

Readership: Students of quantitative methods in business

This is a largely traditional treatment of experimental design with an interesting overlay of scenarios from the authors' experience in business. The presentation is more algebraic than geometric or graphical;  $\bar{y}$ -double-dot notation appears seven pages prior to the first table of illustrative data, and seventeen pages before these data are first compared *via* box plots. The dearth of pictures is surprising for a modern textbook. I am also concerned that analysis of variance and significance testing are given such emphasis as core methods of interpretation. Confidence intervals for means and effects are treated very briefly.

The end-of-chapter exercises are an important part of the book. Some of the methodologies are illustrated with software output from JMP and SPSS, and data sets accompanying the text are available to download at the publisher's web site.

One can sense from reading the text that the authors are convincing expositors in their classrooms. They offer many good insights in their written narratives, but an impatient reader may miss these. The book will be more effective as a course text (accompanied by lectures) than as a reference for self-tutoring. Most students will need a strong instructor to bring perspective to the algebraic forest.

Brookfield, U.S.A.

C.A. Fung

APPLIED STOCHASTIC MODELLING. B.J.T. Morgan. London: Arnold, 2000, pp. xxi + 297, £19.99.

Contents:

1. Introduction and examples
2. Basic model fitting
3. Function optimisation
4. Basic likelihood tools
5. General principles
6. Simulation techniques
7. Bayesian methods and Markov chain Monte Carlo
8. General families of models

Readership: Final year undergraduates, first year mathematics and statistics postgraduate students, scientific researchers using modern statistical methods

This volume provides both the methodology and the underlying theory (without formal proofs) for applying stochastic models to a very broad range of problems. It is driven by real data and problems. The pre-requisite is a typical second-year level course on probability and statistics at a British university. The approach is modern and very computer-oriented; MATLAB is the chosen computer package for analyzing the illustrative data. General topics such as choice of model, parameter transformation and over-parameterization are discussed. Amongst the various methodologies described are deterministic and stochastic search algorithms, profile likelihoods, the EM algorithm and some of its generalizations, bootstrapping, the Gibbs sampler and Metropolis-Hastings algorithms, GLM, GLMM, and GAM models. Appendix A contains some reference material on probability and statistics. Appendix B describes various

aspects of MATLAB. Appendix C summarizes the basic ideas on kernel density estimation. There are lots of exercises plus unusually detailed solutions and comments for selected exercises. The list of references is comprehensive and up-to-date; the subject index is thorough. The book's sets of data and the relevant MATLAB programs are available on its website ([www.arnold-publishers.com/support/stochastic](http://www.arnold-publishers.com/support/stochastic)). I enjoyed reading this book. It should appeal to a wide audience.

University of St Andrews  
St Andrews, U.K.

C.D.Kemp

#### STOCHASTIC PROCESSES: AN INTRODUCTION.

P.W. Jones and P. Smith. London: Arnold/Oxford University Press, 2001, pp. xii + 259, £19.99.

##### Contents:

1. Some background on probability
2. Some gambling problems
3. Random walks
4. Markov chains
5. Poisson processes
6. Birth and death processes
7. Queues
8. Reliability and renewal
9. Branching and other random processes
10. Computer simulations and projects

Readership: Second or third year undergraduates in mathematics, statistics or combined studies with a mathematical content

This is a straightforward introduction for mathematics students to the basic mathematics of stochastic processes. It is the course that has been given for as long as I can remember by most university mathematics departments throughout the English-speaking world. It is well done as far as it goes, and the exercises are well chosen. A concession to modernity is a short section on stopping rules and another giving computer simulation exercises and projects.

This book grew out of a course given again and again over the past twenty years. This alas has not prevented glaring howlers. In an example on the normal distribution moment generating function, the expected area  $E(X_1 X_2)/2$  of a right triangle with independent identically distributed normal perpendicular sides is calculated as  $E(X^2)/2$ , the coefficient of  $t^2$  in the expansion of the moment generating factor. Assiduous editing would also have avoided the discrete uniform distribution on the  $n$  values  $r$  to  $r + n - 1$  having mean  $(n + 1)/2$ , an error repeated in the appendix. I could also have done without oft-repeated recalculation of the means of the exponential (sometimes called negative exponential), geometric, Poisson and uniform distributions.

Imperial College of Science,  
Technology and Medicine  
London, U.K.

R. Coleman

#### MONTE CARLO STRATEGIES IN SCIENTIFIC

COMPUTING. J.S. Liu. New York: Springer-Verlag, 2001, pp. xvi + 343, US\$69.95/DM160.00.

##### Contents:

1. Introduction and examples
2. Basic principles: Rejection, weighting and others
3. Theory of sequential Monte Carlo
4. Sequential Monte Carlo in action
5. Metropolis algorithm and beyond

6. The Gibbs sampler
7. Cluster algorithms for the Ising model
8. General conditional sampling
9. Molecular dynamics and hybrid Monte Carlo
10. Multilevel sampling and optimization methods
11. Population-based Monte Carlo methods
12. Markov chains and their convergence
13. Selected theoretical topics

Readership: Researchers using Monte Carlo methods

This book begins with a brief discussion of standard Monte Carlo methods such as rejection and importance sampling and graduates very quickly to the more recent advances in the subject. The methodology is applied and illustrated through Bayesian missing data problems, molecular simulation, bioinformatics, dynamic system analysis, and self-avoiding random walks. The last half of the book concentrates on Markov Chain based Monte Carlo strategies (the Gibbs sampler, MCMC) and modifications designed to improve the efficiency. There is a brief discussion of coupling methods and perfect sampling and some theoretical topics related to MCMC discussed at the end of the book. This is a worthwhile reference to recent advances in sequential Monte Carlo, primarily Bayesian and Markov Chain methods. To those with an interest in these topics, it is worth a read.

University of Waterloo  
Waterloo, Canada

D.L. McLeish

#### LUNDBERG APPROXIMATIONS FOR COMPOUND DISTRIBUTIONS WITH INSURANCE APPLICATIONS.

G.E. Willmot and X.S. Lin. New York: Springer-Verlag, 2000, pp. x + 250.

##### Contents:

1. Introduction
2. Reliability background
3. Mixed Poisson distributions
4. Compound distributions
5. Bounds based on reliability classifications
6. Parametric bounds
7. Compound geometric and related distributions
8. Tijms approximations
9. Defective renewal equations
10. The severity of ruin
11. Renewal risk processes

Readership: Probabilists, ruin and risk theorists, actuaries, insurers

The monograph studies in careful detail Lundberg-type inequalities for the tail of a compound distribution, based on assumptions both on the mixing sequence and on the mixed distribution. These bounds are mainly of three types, exponentially light tails, heavy Pareto-type tails or intermediate medium-heavy tails and they are derived i.a. when the mixing distribution is based on an underlying Poisson, a mixed-Poisson or a renewal counting process. Also two-sided inequalities are obtained using properties of life distributions that are familiar in reliability theory. This area therefore plays a structuring role in the entire monograph. Other approaches are based on mathematical induction or on martingale theory.

Apart from direct applicability to estimation of compound distributions for the total claim amount in an insurance portfolio, the monograph has a number of special features and illustrations. For example, ruin pro-

babilities re treated both in discrete and continuous time. Further risk quantities like the time of ruin, the severity of ruin and the duration of negative surplus under ruin are discussed in detail.

Katholieke Universiteit Leuven  
Heverlee, Belgium

J.L. Teugels

COMPUTER INTRUSION DETECTION AND  
MONITORING: A STATISTICAL VIEWPOINT.

D.J. Marchette. New York: Springer-Verlag, 2001, pp. xvii  
+ 331, US\$64.95/DM145.00.

Contents:

PART I: Networking Basics  
PART II: Intrusion Detection  
PART III: Viruses and Other Creatures

Readership: Statisticians who wish to become involved in the data analytic aspects of computer security and computer scientists who wish to expand their toolbox of techniques for detecting intruders

This book is about one of those areas that provides rich opportunities for statisticians, where statistics plays an essential role, and where statisticians can have a substantial impact. It is also an area at the interface with computer science. History shows that statisticians are often slow to grasp such opportunities (neural networks, expert systems and data mining spring to mind as three other such areas). The tools for computer intrusion detection are essentially statistical, though considerable familiarity with the application area is needed to be able to apply them; the areas of genomics and proteomics are similar in this regard. This book effectively provides the necessary background material for this intensely jargon-strewn area. The book includes many real examples - along with repeated pleas for the reader not to try the attacks, viruses, worms, etc. described in the book. The statistical tools used in this book include graphical methods, supervised classification and assessment methods such as ROC analysis, cluster analysis, probability models, outlier detection, mixture models, kernel estimators, functional data analysis, neural networks, hidden Markov models, and epidemiological models. The area is characterized by having large sets of data, models which often need to run in real time, and methods which may require adaptive updating estimation algorithms.

The book provides an excellent introduction to the area. I recommend it to any computer- (and Unix-) literate statistician who wishes to make an impact in an area, which will continue to be of great importance.

Imperial College of Science,  
Technology and Medicine  
London, U.K.

D.J. Hand

ELEMENTS OF DISCLOSURE CONTROL. L. Willenborg  
and T. de Waal. New York: Springer-Verlag, 2001, pp. xv  
+ 261, US\$59.00.

Contents:

1. Overview of the area
2. Disclosure risks for microdata
3. Data analytic impact of SDC techniques on microdata
4. Applications of non-perturbative SDC techniques for microdata
5. Applications of perturbative SDC techniques for microdata
6. Disclosure risk for tabular data
7. Information loss in tabular data
8. Applications of non-perturbative techniques for tabular data
9. Applications of perturbative techniques for tabular data

Readership: Official, social and medical statisticians and others involved in releasing personal or business data for statistical use

Statistical disclosure control (SDC) is the discipline concerned with modifying data in such a way that either statistical summaries or microdata may be released without permitting identities of individuals to be deduced - that is, so that confidentiality is preserved.

This book describes the theoretical and methodological issues of SDC, and does not discuss any of the specialized software now available. After an introductory chapter, the next four chapters deal with microdata and the final four with tabular data. The book discusses criteria for determining when data are safe, and distinguishes between 'non-perturbative' methods (recoding, subsampling, table redesign, etc.). There are subtleties: modifying data runs the risk of introducing inconsistencies, and these, in themselves, may permit someone to deduce what kind of modification has been made.

The area is still a rich one for research, with important work remaining to be done. Some such issues are pointed out by the authors. A statistician on the verge of a research career could do worse than consider this area, which has opportunities for theoretical work of practical importance, and which bridges a range of application domains. This book provides a good starting point.

Imperial College of Science  
Technology and Medicine  
London, U.K.

D.J. Hand

PECCAVIMUS

The name of the first author of the book *Correlation and Dependence* was unfortunately incorrectly written; it should have been D. Drouet-Mari. The editor regrets and apologizes for any inconvenience this may have caused.

## NOTES

HOMAGE TO GAIA. The life of an Independent Scientist. J. Lovelock. Oxford University Press, 2001, pp. xxiii + 428, £9.99.

From the book jacket: "For over 35 years, James Lovelock has been producing world-class science from his village home. His work has led to the founding of the Green Movement and his famous Gaia theory has changed the way we think about the Earth.

"This most unusual scientist tells us of his childhood, apprenticeship, and the development of his many influential ideas; the invention of the Electron Capture Detector that revealed that pesticides and harmful chemicals were polluting on a global scale; the discovery that CFCs were accumulating in Earth's atmosphere and endangering the ozone layer; and most importantly, his persistent quest for Gaia."

DARWIN'S MENTOR. John Stevens Henslow, 1796-1861. S.M. Walters and E.A. Stow. Cambridge University Press, 2001, pp. xx + 338, £40.00/US\$59.95.

From the book jacket: "John Stevens Henslow is known for his formative influence on Charles Darwin, who described their meeting as the one event 'which influenced my career more than any other'. As Professor of Botany at Cambridge University, Henslow was Darwin's teacher and eventual life-long friend, but what of the man himself? In this new biography, much previously unpublished material has been carefully sifted and selected to produce a rounded picture of a remarkable philanthropist of the Georgian and Early Victorian periods who made a lasting contribution to the University and to the education system of his day."

THINGS A COMPUTER SCIENTIST RARELY TALKS ABOUT. D.E. Knuth. Stanford, California: CSLI Publications, 2001, pp. xi + 257, US\$35.00/£22.50.

In a series of six lectures, D.E. Knuth aspires the relationship between his vocation and his faith.

GEOSPHERE - BIOSPHERE INTERACTIONS AND CLIMATE. L.O. Bengtsson and C.U. Hammer (Eds.). Cambridge University Press, 2001, pp. xvi + 302, £50.00/US\$74.95.

From the book cover: "*Geosphere-Biosphere Interactions and Climate* brings together many of the world's leading environmental scientists to discuss the interaction between the geosphere-biosphere and climate. The volume arises from a working group of the prestigious Pontifical Academy of Sciences and the International Geosphere-Biosphere Programme. The chapters give a state-of-the-art summary of our current understanding of the present climate and environment by exploring Earth's past, analyzing human influence on the climate, describing climate and its relation to the Earth's surface, ocean, and atmosphere, and making future predictions of climate variability."

SHOTS IN THE DARK. The Wayward Search For An AIDS Vaccine. J. Cohen. New York: Norton, 2001, pp. xvii + 440, US\$27.95.

From the book jacket: "As HIV continues its death march around the globe, now infecting 40 million people, an AIDS vaccine still remains an elusive goal.

"When scientists first proved in 1984 that HIV causes AIDS, a vaccine race quickly spun into action with high hopes that the world would soon have a means to stop this modern plague. But the race to develop an AIDS vaccine now more closely resembles a crawl.

"[The author] tells how the forces inside and outside the world of science have hindered the AIDS vaccine search. He reveals the complicated obstacles that stymie researchers, the uncertain marketplace that confronts pharmaceutical and biotechnology companies, the haphazard political response, and the ethical dilemmas that give pause to everyone involved. He goes behind the scenes at academic labs, companies, government agencies, scientific meetings, and investment houses and documents how promising leads go nowhere as scientists jump from one fashionable idea to the next. Beyond the critique of the current methods and strategies, Cohen offers a persuasive plan for coordinating the scientific efforts, the business interests, and the governmental responsibility in order to achieve more effectively the desired goal of an AIDS vaccine."

BEING GOOD. A Short Introduction to Ethics. S. Blackburn. Oxford University Press, 2001, pp. x + 162

From the book jacket: "It is not only in our dark hours that scepticism, relativism, hypocrisy, and nihilism dog ethics. Whether it is a matter of giving to charity, or sticking to duty, or insisting on our rights, we can be confused, or paralysed by the fear that our principles are groundless. Many are afraid that in a Godless world science has unmasked us as creatures fated by our genes to be selfish and tribalistic, or competitive and aggressive.

"[Blackburn] structures this short introduction around these and other threats to ethics."

THE ETHICS OF MEDICAL RESEARCH ON HUMANS. C. Foster. Foreword by D. Weatherall. Cambridge University Press, 2001, pp. xiii + 159, £50.00/US\$74.95 Cloth; £17.95/US\$24.95 Paper.

From the book jacket: "One of the most difficult problems that confronts clinicians and medical professionals is how to apply ethical principles to real decisions affecting patients. In this even-handed book, Claire Foster examines the three main approaches to moral decision making: goal-based, duty-based and rights-based. ... She also looks at the problematic boundaries where treatment ends and experimentation begins."

INNOVATION IN CHINESE MEDICINE. E. Hsu (Ed.). Cambridge University Press, 2001, pp. xv + 426, £55.00/US\$80.00.

From the book jacket: "In the West ideas about Chinese medicine are commonly associated with traditional therapies and ancient practices which have been in place, unchanging, since time immemorial. This volume ... demonstrates that this is far from the reality. In a series of pioneering case studies, twelve contributors, from a range of disciplines, explore the history of

Chinese medicine and the transformations that have taken place during the course of that history from the fourth century BC to the present day. Topics of discussion cover diagnostic and therapeutic techniques, pharmacotherapy, the creation of new genres of medical writing and schools of doctrine. Given the growing interest in Chinese medicine, the volume promises to make a valuable and innovative contribution. Its interdisciplinarity, a hallmark of the field, will ensure a wide readership amongst scholars and practitioners."

#### THEMES IN THE ECONOMICS OF AGING.

D.A. Wise (Ed.) University of Chicago Press, 2001, pp. ix + 402, US\$75.00.

From the book jacket: "In the past few years, the economic ramifications of aging have garnered close attention from a group of NBER researchers led by David A. Wise. In this volume, Wise and his collaborators continue to analyze a nexus of age-related issues.

"This volume begins by looking at the implications of private and public personal retirement plans, focusing in particular on the impact of 401(k) programs on retirement strategies in light of potential social security reform and factors such as annuitization and asset accumulation. Next, the often-observed relationship between health and wealth is dissected from two different perspectives and correlated with striking increases in health-care spending over the past two decades, despite the improved health of older populations. The volume concludes with an investigation of the retirement effects of various social security provisions in both U.S. and German systems.

"This carefully developed collection expands the current investigative focus and broadens the dialogue on a rapidly growing area of social and economic concern."

#### REGIONAL AND GLOBAL CAPITAL FLOWS.

Macroeconomic Causes and Consequences.

T. Ito and A.O. Krueger (Eds.) University of Chicago Press, 2001, pp. ix + 395, US\$75.00.

From the book jacket: "The volume of capital flows between industrial and developing countries has grown dramatically in the past decade and has become a major issue in a world that is increasingly globalized. In this book, [the authors], two leading experts on this topic, have assembled a group of scholars who address different types of capital flows - bank - lending, direct foreign investment - and the implications they hold for economic performance. By concentrating on macroeconomic issues concerning the flow of private capital to and from the East Asian economies during the currency crises of 1997, the commentary aims to help policy makers avoid such crises in the future. The analyses undertaken here deal with a variety of questions, focusing especially on the "economic fundamentals" of the affected economies and on the irrational "herd behavior" of investors. With its particular focus on the Asian financial crises, this work presents a new model in thinking about the role of private capital flows for policy makers everywhere."

#### WHO OWNS THE SKY? Our Common Assets and the

Future of Capitalism. P. Barnes. Washington, D.C.: Island Press, 2001, pp. xix + 172, US\$22.95.

From the book jacket: "Global warming has finally made clear the true costs of using our atmosphere to soak up unwanted by-products of industrial activity. As nations, businesses, and citizens seek workable yet fair solutions for reducing carbon emissions, the question of who should pay - and how - looms large. Yet the sur-

prising truth is that a system for protecting the atmosphere could be devised that would yield cash benefits to us all.

"...[The author]... redefines the debate about the costs and benefits of addressing climate change. He proposes a market-based institution called a Sky Trust that would set limits on carbon emissions and pay dividends to all of us, who collectively own the atmosphere as a commons. The Trust would be funded by requiring polluters to pay for the right to emit carbon dioxide and managed by a nongovernmental agency. Dividends would be paid annually, in much the same way that residents of Alaska today receive cash benefits from oil companies that drill in their state.

"Employing the same spirit of innovation that brought millions of dollars to the nonprofit sector through his company, Working Assets, Barnes sets forth a practical new approach to our shared inheritance - not only the atmosphere, but water, forests, and other life-sustaining and economically valuable common resources as well. He shows how we can use markets and property rights not only to preserve and share from it, but also to pass it on, undiminished, to future generations."

#### WHEN FORMALITY WORKS. Authority and Abstraction in

Law and Organizations. A.L. Stinchcombe. University of Chicago Press, 2001, pp. ix + 208, US\$16.00/£10.50.

From the book cover: "In this innovative exploration of the concept of formality, or governing by abstraction, [the author] breathes new life into an idea that scholars have all but ignored in recent years.

"We have come to assume that governing our special activities by advance planning - by creating abstract descriptions of what ought to happen and adjusting these descriptions as situations change - is not as efficient and responsive as dealing directly with the real substance of the situation at hand. Stinchcombe argues the opposite. When a plan is designed to correct itself and keep up with the reality it is meant to govern, it can be remarkably successful. In a series of wide-ranging examples, he shows how formalities successfully govern construction blueprints, the denial of rights to a hearing in immigration law, the construction of common law by appeals courts, Fannie Mae's building of a secondary mortgage market, and the formalization of scientific paradigms and programs. Arguing that formality has been misconceived as consisting mainly of its defects, Stinchcombe shows how formality, at its best, can serve us much better than ritual obedience to poorly laid plans or a romantic appeal to 'real life'."

#### KNOWING WHAT STUDENTS KNOW. The Science and

Design of Educational Assessment. J.W. Pellegrino, N. Chudowsky and R. Glaser (Eds.). Washington, D.C.: National Academy Press, 2001, pp. xiv + 366, US\$39.95/CAN\$58.95.

From the book jacket: "*Knowing What Students Know* explains how expanding knowledge in the scientific fields of human learning and educational measurement can advance suggest ways that the tar-gets of assessment — what students know and how well they know it — as well as the methods used to make instructionally useful. Principles for designing and using these new kinds of assessments are presented...."

#### AMERICAN FOUNDATIONS. An Investigative History.

M. Dowie. Cambridge, Massachusetts: The MIT Press, 2001, pp. xl + 320.

From the book jacket: "*In American Foundations*, Marc Dowie argues that organized philanthropy is on the verge of an evolutionary shift that will transform America's nearly 50,000 foundations from covert to overt mediators of public policy, from polite arbiters of knowledge and culture to aggressive creators of new orthodoxy. He questions the wisdom of placing so much power at the disposal of nondemocratic institutions."

EDUCATING INTUITION. R.M. Hogarth. University of Chicago Press, 2001, pp. xii + 335, US\$30.00.£19.00.

From the book jacket: "Every day we make intuitive decisions - from the mundane choice of what clothes to wear to more important judgments such as which new car "feels right" or which person would be "good" for a particular job. To varying degrees, logic plays a role in these decisions, but at a certain point all of us rely on intuition, our sixth sense. Is this the right way to decide? Should we trust our gut feelings? When intuition conflicts with logic, what should we do?"

"In *Educating Intuition*, Robin M. Hogarth lays bare this mysterious process so fundamental to daily life by offering the first comprehensive overview of what the science of psychology can tell us about intuition - where it comes from, how it works, whether we can trust it. From this literature and his own research, Hogarth finds that intuition is a normal and important component of thought that has its roots in processes of tacit learning. Environment, attention, experience, expertise, and the success of the scientific method all form part of Hogarth's perspective on intuition, leading him to the surprising - but natural - conclusion that we can educate our sixth sense. To this end he offers concrete suggestions and exercises to help readers develop their intuitive skills and habits for learning the "right" lessons from experience."

FAST FOOD NATION. The Dark Side of the All-American Meal. E. Schlosser. Boston, Massachusetts: Houghton Mifflin Company, 2001, pp. 356, US\$25.00.

From the book jacket: *Fast Food Nation* is a groundbreaking work of investigation and cultural history that may change the way America thinks about the way it eats.

THE STORY OF TAXOL. Nature and Politics in the Pursuit of an Anti-cancer Drug. J. Goodman and V. Walsh. Cambridge University Press, 2001, pp. xiii+282, £18.95/US\$27.95.

From the book jacket: "Taxol is arguably the most celebrated, talked about, and controversial natural product

in recent years: Celebrated because of its efficacy as an anti-cancer drug and because its discovery has provided powerful support for policies concerned with biodiversity. Talked about because in the late 1980s and early 1990s, the American public was bombarded with news reports about the molecule and its host, the slow-growing Pacific yew. Controversial because the drug and the tree became embroiled in several sensitive political issues with broad public policy implications.

"Taxol has revolutionized the treatment options for patients with advanced forms of breast and ovarian cancers and some types of leukemia; it shows promise for treating AIDS-related Kaposi's sarcoma. It is the best-selling anti-cancer drug ever, with world sales of \$1.2 billion in 1998 and expected to grow. Goodman and Walsh's careful study of how taxol was discovered, researched, and brought to market documents the complexities and conflicting interests in the ongoing process to find effective treatments. From a broader perspective, *The Story of Taxol* uses the discovery and development of taxol as a paradigm to address current issues in the history and sociology of science and medicine."

THE SKEPTICAL ENVIRONMENTALIST. Measuring the Real State of the World. B. Lomborg. Cambridge University Press, 2001, pp. xxiii + 515, £47.50 Cloth, £17.95 Paper.

From the book: "*The Skeptical Environmentalist* challenges widely held beliefs that the environmental situation is getting worse and worse. The author, himself a former member of Greenpeace, is critical of the way in which many environmental organizations make selective and misleading use of the scientific evidence. Using the best available statistical information from internationally recognized research institutes, Bjørn Lomborg systematically examines a range of major environmental problems that feature prominently in headline news across the world. His arguments are presented in non-technical, accessible language and are carefully backed up by over 2,900 notes allowing readers to check sources for themselves. Concluding that there are more reasons for optimism than pessimism, Bjørn Lomborg stresses the need for clear-headed prioritization of resources to tackle real, not imagined problems.

"*The Skeptical Environmentalist* offers readers a non-partisan stocktaking exercise that serves as a useful corrective to the more alarmist accounts favoured by campaign groups and the media. It is essential reading for anybody with a serious interest in current environmental debates."

## NEW EDITIONS, PAPER EDITIONS OR REPRINTS

A HANDBOOK OF STATISTICAL ANALYSES USING SAS, 2nd edition. G. Der and B.S. Everitt. Boca Raton, Florida: Chapman and Hall/CRC, 2002, pp.xi + 360, US\$41.99/£24.99.

AN INTRODUCTION TO GENERALIZED LINEAR MODELS, 2nd edition. A.J. Dobson. Boca Raton, Florida: Chapman and Hall/CRC, 2002, pp. vii + 225, [Original, 1990; Short Book Reviews, Vol. 10 p.28]

APPLYING AND INTERPRETING STATISTICS. A Comprehensive Guide, 2nd edition. G. McPherson. New York: Springer-Verlag, 2001, pp. xxviii + 640, US\$79.95/CAN\$122.75/DM177.00 [Original, 1990; Short Book Reviews Vol. 10, p.43]

ASYMPTOTIC APPROXIMATIONS OF INTEGRALS. R. Wong. Philadelphia: Society for Industrial and Applied Mathematics, 2001, pp. xvii + 543. [Original, 1989]

- BAYESIAN METHODS. An Analysis for Statisticians and Interdisciplinary Researches. T. Leonard and J.S.J. Hsu. Cambridge University Press, 2001, pp. xiv + 333, £23.95/US\$34.95 Paper. [Original, 1999; Short Book Reviews, Vol. 20 p.25]
- FINITE ELEMENT SOLUTION OF BOUNDARY VALUE PROBLEMS. Theory and Computation. O. Axelsson and V. A. Barker. Philadelphia, PA: Society for industrial and Applied Mathematics, 2001, pp. xxiii + 432. [Original, 1984]
- KNOTS AND PHYSICS, 3rd edition. L. H. Kauffman. Singapore: World Scientific, 2001, pp. xvi + 770, US\$90.00.
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- PROBABILITY, RANDOM VARIABLES, AND STOCHASTIC PROCESSES, 4th edition. A. Paoulis and S.U. Pillai. Boston: McGraw Hill, 2002, pp. x + 852.
- RANDOM GRAPHS, 2nd edition. B. Bollobás. Cambridge University Press, 2001, pp. xviii + 498, US\$120.00/£75.00 Cloth; £29.95/US\$44.95 Paper.
- STATISTICS FOR LAWYERS, 2nd edition. M.O. Finkelstein and B. Levin. New York: Springer-Verlag, 2001, pp. xxx + 617, US\$79.95/DM177.00. [Original, 1990; Short Book Reviews, Vol. 10 p.42]
- TELEPHONE SURVEY METHODOLOGY. R.M. Goves, P.P. Biemer, L.E. Lyberg, J.T. Massey, W.I. Nicholls II and J. Waksberg (Eds.). New York: Wiley, 2001, pp. xx + 581, £62.95 [Original, 1988]
- THE HANDBOOK OF STATISTICAL ANALYSES USING S-PLUS, 2nd edition. B.S. Everitt. Boca Raton, Florida: Chapman and Hall/CRC, 2002, pp. xiii + 240. [Original, 1994; Short Book Review, Vol. 19, p.42]
- TIME SERIES. Data Analysis and Theory. D.R. Brillinger. Philadelphia: Society for Industrial and Applied Mathematics, 2001, pp. xx + 540. [Original, 1981; Short Book Reviews, Vol. 1, p. 12]

### GOVERNMENT PUBLICATIONS

- STATISTICS NORWAY. Annual Report 2000. Oslo: Statistics Norway, 2001, pp.44

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- DEMOGRAPHIC YEARBOOK 1999. Fifty-first issue. ST/ESA/STAT/SER.R/30, 2001, U.N. Sales No. E/F.01.XIII.1, pp. viii + 609.
- 1998 ENERGY STATISTICS YEARBOOK. ST/ESA/STAT/SER.J/42, 2001, U.N. Sales No. E/F.01.XVII.12, pp. liii + 516.
- HANDBOOK ON POPULATION AND HOUSING CENSUS EDITING. Studies in Methods, Series F. No. 82. ST/ESA/STAT/SER.F/82, 2001, U.N. Sales No. E.00.XVII.9, pp. xiv + 124.
- POPULATION AND VITAL STATISTICS REPORT. Statistical Papers Series A. Vol. LIII, No. 3. Data available as of 1 July 2001. ST/ESA/STAT/SER. A/218, 2001, pp. 19.
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- BIOSTATISTICAL METHODS. S.W. Looney (Ed.). Totowa, New Jersey: Humana Press, 2002, pp. xii + 214, US\$89.50.
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- TIME AND CHANCE. D.Z. Albert. Cambridge, Massachusetts: Harvard University Press, 2000, pp. xi + 172, £20.50.
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- VIRTUAL AUTOMATION ENVIRONMENTS. Design, Modeling, Visualization, Simulation. H. Mayr. New York: Dekker, 2002, pp. xxii + 275, US\$85.00.

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