
Contents: 
PART I: Collecting Data 
1. School-based drug prevention: Challenges in designing and analyzing social experiments 
2. The health insurance experiment: Design using the finite selection model 
3. Counting the homeless: Sampling difficult populations 
PART II: Defecting Effects 
4. Periodicity in the global mean temperature series? 
5. Racial bias in death sentencing: Assessing the statistical evidence 
6. Malpractice and the impaired physician: An application of matching 
PART III: Understanding Relationships 
7. Supply delays for F-14 jet engine repair parts: Developing and applying effective data graphics 
8. Hospital mortality rates: Comparing with adjustments for case mix and sample size 
9. Eye-care supply and need: Confronting uncertainty 
10. Modeling block grant formulas for substance abuse treatment 

Readership: Advanced undergraduate and graduate students of statistics and/or public policy, and empirical researchers and policy makers (especially at government and other research institutes) 

RAND is a research institute created by the U.S. Air Force originally with a mandate “to provide objective research on national security issues.” It is now an independent research organization that through grants and contracts from a variety of sources provides a research resource for public policy makers. The RAND Statistics Group was formed in 1976 and this book is a collection of some of their case studies. 

AuthToken: The authors are the statistical investigators, each chapter lays out a statistical case study in a common nine section format: Executive Summary, 1. Introduction (always comprised of A. Policy Problem, B. Research Questions, C. Statistical Questions, and D. Summary of Data and Methods), 2. Design, Data Collection, Description of Data Sources and Description of Data, 3. Datafile Creation, Destructive Stats and Exploratory Analysis, 4. Statistical Methods and Models, 5. Results, 6. Discussion (covering policy implications and statistical issues), 7. Exercises and finally further RAND Reading (accessible at www.rand.org). 

The sets of data for each chapter and errata are available on the Web (www.rand.org/centers/stat/casebook). 

As with any collection of papers, some chapters are better than others; as with any statistical investigation, different approaches might have been taken in each case. Rather than detract from the book, these make the book a more interesting resource to be enlivened by an instructor of an advanced undergraduate or graduate course in statistics. Students of public policy might find the statistical aspects of the case studies somewhat challenging. 

I strongly recommend it as a resource to instructors in statistics. Its breadth of applications and its organization of topics within papers make the book an important contribution to the growing collection of books on case studies in statistics. 

University of Waterloo 
Waterloo, Canada R.W. Oldford 

THE PURSUIT OF PERFECT PACKING. T. Aste and D. Weaire. Bristol, Philadelphia: Institute of Physics, 2000, pp. xi + 136, £45.00/US$45.00 Cloth; £17.50/US$29.00 Paper. 

Contents: 
1. How many sweets in the jar? 
2. Loose change and tight packing 
3. Hard problems with hard spheres 
4. Proof positive? 
5. Peas and pips 
6. Enthusiastic admiration: The honeycomb 
7. Toils and troubles with bubbles 
8. The architecture of the world of atoms 
9. Apollonius and concrete 
10. The giant’s causeway 
11. Soccer balls, golf balls and buckyballs 
12. Packing and kisses in high dimensions 
13. Odds and ends 
14. Conclusion 

Readership: An entertaining introduction to the field for both specialists and the more general public 

AuthToken: This book is packed with examples of ‘packing’ in mathematics, physics, biology and engineering. In 1998 a solution was claimed (by Thomas Hales) to the long-standing Kepler conjecture – that no arrangement of spheres of equal radius in three-dimensional space has density greater than that of the face-centred cubic packing.
This remarkable result would provide a resolution, where many previous attempts have been found wanting. The Kepler conjecture is, in fact, a particular part of the eighteenth of the famous twenty-three problems posed by David Hilbert in 1900 to guide mathematical research.

The style of this book is concise and informal, but the material which is included, together with key references, will enable the curious reader to follow up the conjecture in its historical context and a large number of related problems with extensive applications. This is an excellent read!

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

New York: Springer-Verlag, 2000, pp. xxi + 353, US$69.95/DM129.00/£46.84.

Contents:
1. Uncertainty, intuition, and expectation
2. Expectation
3. Probability
4. Some basic models
5. Conditioning
6. Applications of the independence concept
7. The two basic limit theorems
8. Continuous random variables and their transformations
9. Markov processes in discrete time
10. Markov processes in continuous time
11. Action optimization: Dynamic programming
12. Optimal resource allocation
13. Finance: ‘Risk-Free’ trading and option pricing
14. Second-order theory
15. Consistency and extension: The finite-dimensional case
16. Stochastic convergence
17. Martingales
18. Large-deviation theory
19. Extension: Examples of the infinite-dimensional case
20. Quantum mechanics

Readership: Students with a basic mathematical faculty, interested in probability

The fourth edition still honours the statement made in the Preface to the 1970 Russian Edition: "When this text was published in 1970 I was aware of its unorthodoxy, and uncertain of its reception. Nevertheless, I was resolved to let it speak for itself, and not to advocate further the case there presented." The four editions have indeed spoken out loudly: a clear success in its unorthodoxy, presented. "The four editions have indeed spoken out loudly: a clear success in its unorthodoxy, presented. Nevertheless, I was resolved to let it speak for itself, and not to advocate further the case there presented."

This remarkable result would provide a resolution, where many previous attempts have been found wanting. The Kepler conjecture is, in fact, a particular part of the eighteenth of the famous twenty-three problems posed by David Hilbert in 1900 to guide mathematical research.

ETH-Zürich
Zürich, Switzerland P.A.L. Embrechts

PROBABILITY FOR STATISTICIANS, G.R. Shorack.
New York: Springer-Verlag, 2000, pp. xviii + 565, US$79.95/DM159.00/£52.95

Contents:
1. Measures
2. Measurable functions and convergence
3. Integration
4. Derivatives via signed measures
5. Measures and processes on products
6. General topology and Hilbert space
7. Distribution and quantile functions
8. Independence and conditional distributions
9. Special distributions
10. WLLN, SLLN, and series
11. Convergence in distribution
12. Brownian motion and empirical processes
13. Characteristic functions
14. CLTs via characteristic functions
15. Infinitely divisible and stable distributions
16. Asymptotics via empirical processes
17. Asymptotics via Stein’s approach
18. Martingales
19. Convergence in law on metric spaces

APPENDIX A: Distribution Summaries

Readership: Faculty, researchers and postgraduate students interested in mathematical statistics

This book offers a rigorous introduction to measure-theoretic probability with particular attention to topics of interest to mathematical statisticians. There is an unusual coverage with more attention to those probabilistic results used in mathematical statistics and asymptotics, including properties of the quantile and the empirical process, L- and R-statistics, U-statistics, the bootstrap and Skorokhod embedding. The style is mathematical while liberally interspersed with parenthetical remarks (e.g. "Nice!", "Everything else is even more trivial!") and acronyms, even in chapter headings. This goes well beyond the traditional results in a first course in probability including Stein's approach on the Central Limit Theorem and is recommended for anyone interested in the probability underlying modern statistics.

University of Waterloo
Waterloo, Canada D.L. McLeish


Contents:
PART I: Fundamental Quality Improvement and Statistical Concepts
1. Introduction
2. Basic tools for improving quality
3. Basic concepts in statistics and probability

PART II: Control Charts and Process Capability
4. Control charts for measurements with subgrouping (for one variable)
5. Control charts for measurements without subgrouping (for one variable)
6. Control charts for attributes
7. Process capability
8. Alternatives to Shewhart charts
9. Multivariate control charts for measurement data
10. Miscellaneous control chart topics

PART III: Beyond Control Charts: Graphical and Statistical Methods
11. Other graphical methods
12. Linear regression
13. Design of experiments
14. Contributions of Genichi Taguchi and alternative approaches
15. Evolutionary operation
16. Analysis of means
17. Using combinations of quality improvement tools

Readership: Students in applied statistics and quality engineering; practicing statisticians and engineers in industry

This is a significant update of Professor Ryan's textbook from 1988. The chapters on statistical process control and process capability have been expanded considerably to include recent research in the field. The chapter on design of experiments is also longer, with the inclusion of robust design issues. The book is very well written.

While acknowledging the fashions of the day (Six Sigma in this edition, and "Japan's Approach" in the first edition), the author keeps his focus on the statistical issues that are at the heart of quality improvement. Most of the book is dedicated to control charting, process capability, and design of experiments—including Evolutionary Operation.

This book would be suitable for a second course for statistics students who are interested in a career in industry. Many references are provided, giving an up-to-date starting point for getting to know the literature.

Brookfield, U.S.A. C.A. Fung

STATISTICAL PROCESS CONTROL IN INDUSTRY:
IMPLEMENTATION AND ASSURANCE OF SPC

Contents:
Introduction
1. SPC: A historical perspective
2. SPC as part of quality policy
3. Implementation plans for SPC
4. Introducing SPC with teams
5. The plan of action for introducing SPC
6. Principles of the Shewhart type of control charts
7. Designing control charts to support improvement
8. Control charts
9. Tools for solving problems
10. From control to assurance
11. Software for SPC
12. SPC competition and self-evaluation

Readership: Managers and engineers seeking guidance on how to initiate statistical process control in manufacturing

This book is a revised translation of the original Dutch work from 1996. It presents statistical process control (SPC) as a philosophy for operations management on the shop floor. The statistical methods employed are the standard, simple, well-established ones. The work is more a prescription for management strategy than a statistical textbook. The authors offer a plan of activities by which companies with no prior experience with SPC can get started, developed from their experiences with three Dutch companies. Examples are given of SPC in mass production, in low volume production, and in very low volume production. The main value of the book is in the direction it can offer to non-statistical managers who want to help introducing SPC, but the reader will need to take care to adapt the authors' recommendations to their own companies' cultures.

Statistics itself occupies less than half the book. Not much numeracy is expected of the reader, but there are occasional, surprising, excursions into statistical theory in this volume which presumably was aimed at managers. The book would be a useful companion to be read together with a more traditional SPC text.

Brookfield, U.S.A. C.A. Fung

STATISTICAL MODELLING WITH QUANTILE FUNCTIONS.

Contents:
1. An overview
2. Describing a sample
3. Describing a population
4. Statistical foundations
5. Foundation distributions
6. Distributional model building
7. Future distributions
8. Identification
9. Estimation
10. Applications
11. Regression quantile models
12. Bivariate quantile distributions
13. A postscript

APPENDIX 1: Some Useful Mathematical Results
APPENDIX 2: Further Studies in the Method of Maximum Likelihood
APPENDIX 3: Bivariate Transformations

Readership: Statisticians, scientists working with statistical modelling

From the book preface: “This book looks at statistical modelling from a different perspective.” The book deals with the steps of the statistical modelling process, using quantile methods, as a tool for problem solving. In the first chapter, the author gives a very good overview of the subject covering an overall process of background construction, identification, estimation, validation and application to show “the wood for the trees”. No attempt has been made to apply the recommended approaches to a real large set of data as a sample. The reason mentioned by the author (p. 167) is for the sake of saving space, but it would have been worth while to have added some extra pages. Beyond minor typographical and some notational errors, the book is a good introduction to the subject and will serve statisticians, researchers, etc. in their modelling work. The researchers will undoubtedly gain a lot of knowledge and insight of the core modelling ideas and techniques by reading this book.

I enjoyed reading this book; it is well written, easy to read and it would be worth considering as a text for honour students or as a seminar course at a graduate level.

Isfahan University of Technology
Isfahan, Iran A. Parsian

Contents:
PART I: Basic Theory
1. Bootstrap sampling distributions
2. Subsampling in the I.I.D. case
3. Subsampling for stationary time series
4. Subsampling for nonstationary time series
5. Subsampling for random fields
6. Subsampling marked point processes
7. Confidence sets for general parameters

PART II: Extensions, Practical Issues, and Applications
8. Subsampling with unknown convergence rate
9. Choice of block size
10. Extrapolation, interpolation, and higher order accuracy
11. Subsampling the mean with heavy tails
12. Subsampling the autoregressive parameter
13. Subsampling stock returns

Readership: Statisticians working on subsampling theory

On an intuitive level, the subsampling techniques are based on the assumption that a sample, which we exercise with, is a valid “image” of the original population/ probability space. Believing in that, we can consider this sample as a finite “population” and forget about its origin. Instead of experimenting with the real population we resort to experimenting with the latter. All experiments/subsamplings (like jackknifing, bootstrapping, moving blocks bootstrapping, etc.) can be done on the computer at a relative low expense. Those experiments generate some statistics and the authors are mainly concerned with their asymptotic behaviour when the size of “real” sample increases infinitely. They describe assumptions which must be imposed on the original sampling (for instance, weak convergence of the empirical distribution to the original distribution) to guarantee the reasonable asymptotic behaviour of the statistics based on extensive experiments with a smaller world – the sample in our hands. The book is one of the most comprehensive texts in the subsampling realm and provides a solid background for researchers working the related areas of statistics.

SmithKline Beecham
Collegeville, U.S.A.

V.V. Fedorov


Contents:
1. Prologue
2. Regression methods
3. Adaptive LAD+LS regression
4. Adaptive LAD+TLS regression
5. Adaptive LAD+ M-regression
6. Adaptive LS+TLS regression
7. Adaptive choice of trimming
8. Adaptive combination of tests
9. Computational aspects
10. Some asymptotic results
11. Epilogue

Readership: Statisticians

This book deals with nonstandard techniques of regression estimation. Starting with well-known methods for regression estimation such as the least squares (LS) method, trimmed least-squares (TLS) method, least-absolute deviation (LAD) method, and Huber’s robust M-method, the authors concentrate on adaptive estimators which minimize loss-functions that are convex combinations of loss-functions of two corresponding estimators. The detailed analysis of methods, as well as numerical illustrations, are presented.

AT&T
Redbank, U.S.A.

and Royal Holloway College
London, U.K.

V.N. Vapnik


Contents:
1. Some regression examples
2. Regression and the forward search
3. Regression
4. Transformations to normality
5. Nonlinear least squares
6. Generalized linear models

Readership: Regression practitioners, and students of regression with knowledge of matrix algebra

This very down-to-earth volume explores regression models via a “forward search” technique in which samples of increasing size are taken from the data, and plots are made to show off characteristic features. An initial fit uses a best-fitting, robustly estimated model chosen from fits to small subsets of the data. The subset size is increased by one (sometimes one fresh point is added, sometimes two are added and one leaves, and so on). The fitting continues until all data are included. For each best subset choice we thus have residuals available and their loci, as subset size changes, can be plotted and examined. Other plots (for example, of R2, Cook’s statistics, t-statistics) can also be made. Programming was done in GAUSS, and S-Plus functions have been developed. A web site provides programs and data, and is expected to grow. These methods provide additional analysis techniques for regression practitioners, and the book is a welcome addition to the literature.

University of Wisconsin
Madison, U.S.A.

N.R. Draper


Contents:
1. Preliminaries
2. Univariate normal model
3. Multivariate normal model
4. Regression models
5. Gamma model
6. Exponential model
7. Discrete models

Readership: Theoretical and applied statisticians, quality control engineers and economists as well as graduate students in statistics

The change-point problem can be considered one of the central problems of statistical inference linking together theory of estimation and testing hypotheses, frequentist and Bayesian approaches, fixed sample and sequential procedures and parametric and nonparametric methods. This book deals with three parametric methods for fixed sample change-point inference: likelihood ratio procedure, informational approach and Bayesian approach. All but the most basic models are carefully developed with
detailed proofs of asymptotic null distributions, and illustrated by using a number of data sets. The binary segmentation procedure is used to reduce the general problem of detecting and localization of many change points to the case of a single change point. Although all results are based on asymptotic theory, no Monte-Carlo results comparing the small sample performance of the procedures are presented. The book would make ideal reading for anyone contemplating undertaking research in the area.

GlaxoSmithKline
Collegeville, U.S.A. V. Dragalin

STATISTICAL PATTERN RECOGNITION A. Webb.

Contents:
1. Introduction to statistical pattern recognition
2. Estimation
3. Density estimation
4. Linear discriminant analysis
5. Nonlinear discriminant analysis – neural networks
6. Nonlinear discriminant analysis – statistical methods
7. Classification analysis
8. Feature selection and extraction
9. Clustering
10. Additional topics

APPENDIX A: Measures of Dissimilarity
APPENDIX B: Parameters Estimation
APPENDIX C: Linear Algebra
APPENDIX D: Data
APPENDIX E: Probability Theory

Readership: Graduate students; teachers; researchers and practitioners in engineering, statistics, computer science, information technology and the social sciences who need an up-to-date account of the topic

This book deals mainly with classifier design. It contains descriptions of many of the most useful of today's pattern processing techniques including many of the recent advances in nonparametric approaches to discrimination.

Chapters 2 to 9 study the problems of data transformation and supervised classification (discrimination) and unsupervised classification (clustering) procedures. These chapters end with the subsections: application studies, summary and discussion, recommendations, notes and references, and exercises. Chapter 10 briefly addresses the classifier performance assessment and the problems with data: mixed variables, outliers, missing values and unreliable labelling. The exercises at the ends of Chapters 2 to 10 vary from 'open book' questions to more lengthy computer projects. Most of the illustrative examples to help guide the reader through the techniques presented come from real-world applications studies. More than seven hundred references (including references published in 1999) are provided where further details on applications, comparative studies and theoretical developments may be obtained. Four appendices largely cover background material and material appropriate if the book is used as a text for a 'conversion course'. All chapters begin with a theoretical overview, and most relevant electronic contact addresses are provided. However, an overview and a brief evaluation of the software packages available could also be very interesting for the practitioners and the other targeted readers too.

In conclusion, the book indeed provides a comprehensive account of the most recent advances in statistical pattern recognition techniques with emphasis on methods and algorithms for discrimination and classification. It will be very useful as an informed and thought-provoking source of reference, as well as a text for lecture courses.

Technical University of Lisbon
Lisbon, Portugal M. R. Ramalho

MODELLING SURVIVAL DATA: EXTENDING THE COX MODEL T.M. Therneau and P.M. Gamsbch.
New York: Springer-Verlag, 2000, pp. xii + 350, US$69.95/DM152.00.

Contents
1. Introduction
2. Estimating the survival and hazard function
3. The Cox model
4. Residuals
5. Functional form
6. Testing proportional hazards
7. Influence
8. Multiple events per subject
9. Fraility models
10. Expected survival

APPENDIX A: Introduction to SAS and S-Plus
APPENDIX B: SAS Macros
APPENDIX C: S Functions
APPENDIX D: Data Sets
APPENDIX E: Test Data

Readership: Professional statisticians, statistical practitioners, graduate students of statistics

The Kaplan-Meier estimator and Cox's proportional hazards model are the standard techniques for handling censored survival data. Over recent years an alternative view, based on counting processes and martingale theory, has enabled these models to be extended to more complex situations such as non-proportional hazards, multiple outcomes, subject-specific or fraility models. These methods are mathematically sophisticated. The authors do not shrink the mathematics but the emphasis is on concepts, and above all, on showing how to fit the models to data with SAS or S-Plus.

Of course fragments of computer code are given, but this is not a black-box approach. The authors go far beyond this. They have laid out for us the wealth of their practical experience at all levels; the numerical aspects; computer algorithms; evaluation of different methods and connections between them; possible pitfalls; and interpretation of the results. Remarkable insights abound.

This book complements that of P. Hougaard [Short Book Reviews, Vol. 21, p. 6] by giving much detail on the actual fitting of the models discussed by him. It will serve two audiences: the busy practitioner who has not had time to catch up with martingale theory and counting processes and the graduate student who has just completed such a course and who needs to be introduced to the practicalities and judgements needed in data analysis. It is likely to become a well-thumbed copy on the statistician's desk and statistical practice will be the better for it.

University of Cape Town
Rondebosch, South Africa J.M. Juritz

ANALYSIS OF MULTIVARIATE SURVIVAL DATA

In conclusion, the book indeed provides a comprehensive account of the most recent advances in statistical pattern recognition techniques with emphasis on methods and algorithms for discrimination and classification. It will be very useful as an informed and thought-provoking source of reference, as well as a text for lecture courses.

Technical University of Lisbon
Lisbon, Portugal M. R. Ramalho
Contents:

1. Introduction
2. Univariate survival data
3. Dependence structures
4. Bivariate dependent measures
5. Probability aspects of multi-state models
6. Statistical inference for multi-state models
7. Shared frailty models
8. Statistical inference for shared frailty models
9. Shared frailty models for recurrent events
10. Multivariate frailty models
11. Instantaneous and short term frailty models
12. Competing risks
13. Marginal and copula modeling
14. Multivariate non-parametric estimates
15. Summary

Readership: Statisticians, graduate students of statistics, research workers in survival analysis

Over the last decade there have been vast developments in methods for the analysis of survival data, especially when independence between survival times cannot be assumed. The author has brought these developments together in a book that is destined to become the professional statistician’s reference and the standard text for a graduate study of the subject. Exercises to sharpen the intuition and indicate further results are included at the end of each chapter.

In the first chapter, a number of examples of survival data are presented, each exhibiting a particular type of dependence. In some sets, the survival times are related within a group but independent between groups giving rise naturally to random effects or frailty models; in others dependence arises through multiple events and lead to multi-state models. Some of the sets of data exhibit both features. These and other sets of data are used to motivate models, either ones of increasing complexity and/or others that highlight different aspects of the data. Each model is discussed in detail, interpreted, evaluated and compared with others. Both parametric and non-parametric models are considered and the purpose of each model is made clear. The author has a remarkable gift of illustrating abstract concepts with concrete examples. Detailed cross-referencing make the text easy to read. Many of the models cannot be fitted with commercially available software but sufficient detail and comment on the numerical behaviour is given to enable a competent programmer to implement them.

This book, however, is much more than a compendium of useful models for survival data. The author’s discussion of time scales, the effect of censoring and the role of covariates touch the very heart of survival analysis. His insights into the nature of dependence extend far beyond survival analysis and touch on some of the most fundamental aspects of our discipline.

The book by Therneau and Grambsch, [Short Book Reviews, Vol.21, p. 5] has shown what can be done today with widely available statistical software. Hougaard’s book shows why we do it and points to what we shall be able to do tomorrow. Together these books will have a wide impact on the use of a statistical technique whose importance is beginning to be appreciated far beyond the medical and industrial fields that originally motivated it.

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J.M. Juritz


Contents:

PART A: Meta-Analysis Methodology: The Basics
1. Introduction meta-analysis: Its development and uses
2. Defining outcome measures used for combining via meta-analysis
3. Assessing between study heterogeneity
4. Fixed effects methods for combining study estimates
5. Random effects models for combining study estimates
6. Exploring between study heterogeneity
7. Publication Bias
8. Study quality
9. Sensitivity analysis
10. Reporting the results of a meta-analysis

PART B: Advanced and Specialized Meta-Analysis Topics
11. Bayesian methods in meta-analysis
12. Meta-analysis of individual patient data
13. Missing data
14. Meta-analysis of different types of data
15. Meta-analysis of multiple and correlated outcome measures
16. Meta-analysis of epidemiological and other observational studies
17. Generalized synthesis of evidence-combining different sources of evidence
18. Meta-analysis of survival data
19. Cumulative meta-analysis
20. Miscellaneous and developing areas of application in meta-analysis

APPENDIX I: Software Used for Examples in this Book

Readership: Medical statisticians, medical researchers using meta-analysis

This book represents an expansion of the authors’ review paper on methodology for meta-analysis published in 1998. The review material has been revised, updated and worked examples have been added. In addition, a description of how to carry out each illustrative example is included in an Appendix and a companion website for the book has been developed.

The very readable book will be very useful as an introduction to methods for meta-analysis and as a reference volume. The discussion in the book is well balanced and a thorough initial reading of the book, before using it as a reference for individual topics, would be a good investment of time. The brief discussion/summary comments on NNT (number needed to treat), the comparison of random and fixed effect models, and the use of individual patient data provide good examples of the authors’ insight. However, for a few topics, some readers may feel the book stops short and gives less attention than appropriate to more general issues and methods. For example, likelihood based methods and general regression models receive relatively brief treatment and a reference is given for Zelen’s exact test for homogeneity of an odds ratio without pointing out that the asymptotic version given in the same paper is known to be flawed. References for further reading are given frequently however.

Some concern about the current status of meta-analysis in medical research may be justified. However, it is widely used and this excellent book should improve the quality of its application.

University College London
London, U.K.
V.T. Farewell
The book’s basic premise is that (i) science is concerned with repeatable experiments; (ii) the data y can be modeled as coming from a hypothetical infinite population of possible observations having probabilities f(y,θ); (iii) once y has been observed, probability statements are no longer relevant and all that matters is the likelihood function f(y,θ) as a function of θ.

The principal tools for inference concerning θ are the graph of the likelihood function and sets of “plausible” values of θ, i.e. values for which the likelihood exceeds a given constant. Connections between such likelihood intervals and confidence, fiducial and Bayes intervals are established through the consideration of pivotal quantities. In addition to inferences about θ, the problem of testing the model is considered. The tests are carried out in terms of traditional p-values.

On this basis the author builds an unconventional but rich and cohesive approach with applications to many of the standard problems considered in more traditional texts. The material is presented as a first course, with a probability but no statistics prerequisite. However, I believe that it is more suitable for students with previous exposure to a more traditional treatment. For such a reader it can be highly recommended as an enjoyable and stimulating introduction to an alternative point of view.

University of California Berkeley, U.S.A. E.L. Lehmann

STOCHASTIC PROCESSES. INFERENCE THEORY.

Contents
1. Introduction and preliminaries
2. Some principles of hypothesis testing
3. Parameter estimation and asymptotics
4. Inferences for classes of processes
5. Likelihood ratios for processes
6. Sampling methods for processes
7. More on stochastic inference
8. Prediction and filtering of processes
9. Nonparametric estimation for processes

Readership: Mathematical statisticians

This is an impressive book dealing with the classical statistical inference for stochastic processes. General versions of the maximum likelihood principle of Fisher and the fundamental lemma of Neyman and Pearson are the basis for parameter estimation and hypothesis testing. The classes of stochastic processes considered are: Gaussian, infinitely divisible, jump Markov, diffusion and adaptive. The work is of a high mathematical quality and is written in a format with theorems and proofs. Each chapter ends with bibliographical notes, complements and exercises. The latter make the book also interesting for teaching graduate courses.

Limburgs Universitair Centrum Diepenbeek, Belgium N.D.C. Veraverbeke

ASYMPTOTICS IN STATISTICS. SOME BASIC CONCEPTS.

Contents
1. Introduction
3. Local asymptotic normality
7. Independent, identically distributed observations
8. On Bayes procedures

Readership: Mathematical statisticians

Lucien Le Cam, one of the founding fathers of modern asymptotic theory for statistical inference, completed this second edition of the 1990 book just before his death on April 25, 2000. It is co-authored with Grace Lo Yang, and as they say in the introduction, it is “revised and enlarged”. The main change is the inclusion of a new Chapter 4 of about twenty-five pages on ‘Gaussian Shift and Poisson Experiments’. They are very important in modelling and also as limits of other experiments. Several other chapters have been augmented with new material, and various proofs have been reworked. Some important topics have not been taken up in this monograph, but references to recent books have been given. It is a very valuable book giving a coherent view of the basic concept and tools of the asymptotic theory in statistical inference.

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N.D.C. Veraverbeke

ASYMPTOTIC THEORY OF STATISTICAL INFERENCE FOR

Contents:
1. Elements of stochastic processes
2. Local asymptotic normality for stochastic processes
3. Asymptotic theory of estimation and testing for stochastic processes
4. Higher order asymptotic theory for stochastic processes
5. Asymptotic theory for long-memory processes
6. Statistical analysis based on functionals of spectra
7. Discriminant analysis for stationary time series
8. Large deviation theory and saddlepoint approximation for stochastic processes

Readership: Mathematical statisticians

This book is a thorough survey of statistical inference methods for various classes of stochastic processes. The inference methods are based on asymptotics and include testing, estimation, discriminant and cluster analysis, nonparametric methods, large deviation results, saddle-point approximations, etc. Le Cam’s concept of local asymptotic normality plays a fundamental role in the approach. There is a rich bibliography with more than four hundred items. The problem sections at the end of each chapter make the book also suitable for advanced coursework in stochastic processes.

Limburgs Universitair Centrum
Diepenbeek, Belgium
N.D.C. Veraverbeke

MARKOV POINT PROCESSES AND THEIR APPLICATIONS.
M.N.M. van Lieshout. London: Imperial College Press, 2000, pp. viii + 175, £30.00.

Contents:
1. Point processes
2. Markov point processes
3. Statistical inference

Readership: Mathematical statisticians

In an increasing number of important areas of application, the basic data are spatial in nature. In this monograph, a brief overview of one class of probability models for such data is given that permits interactions between points, as long as the inter-point dependencies are determined by neighbours. The requisite background in general point processes is included. Some applications are used throughout for motivation, with more than half of the book devoted to topics of statistical inference (including Monte Carlo and maximum likelihood methods) and subsequent detailed and instructive applications. This book will be a useful reference in an area of considerable current activity.

University of Washington
Seattle, U.S.A.

R. Pyke

COUPLING, STATIONARITY, AND REGENERATION.

Contents:
1. Random variables
2. Markov chains and random walks
3. Random elements
4. Stochastic processes
5. Shift-coupling
6. Markov processes
7. Transformation coupling
8. Stationarity, the Palm dualities
9. The Palm dualities in higher dimensions
10. Regeneration

Readership: Probabilists, theoretical statisticians working in Markov chain Monte Carlo

Coupling has been a tool in the probabilist’s workbox for many years now. While tremendously useful for the expert, its use can meet resistance. Mathematicians are prone to claim “that’s cheating” when confronted by a construction of two random processes carefully chosen to be independent in such a way as to make a proof easy. This book begins with an overview of some important examples of coupling (Chapters 1 and 2), then proceeds to a careful exposition of measure-theoretic details (Chapters 3 to 6) which is ideal for the purpose of silencing idle mathematical hecklers. Already in these chapters the author brings in some of his own gifts to coupling theory (equivalences between various kinds of coupling, asymptotics, and $\sigma$-algebra properties).

The book is completed by three long chapters (Chapters 8, 9 and 10) providing sustained accounts of the author’s particular contributions; invaluable and stimulating reading. The book is not, nor is it intended to be, an encyclopaedia of the wide diversity of coupling methods, nor is it intended to give an authoritative historical overview (there are useful remarks in the notes, but the author confesses to having sacrificed historical completeness to the end of actually getting the book published in finite time). What the book does offer is a careful, stimulating, and original discussion of major themes in coupling. As such, it will be invaluable to probabilists and also to the increasing number of statisticians working on Markov Chain Monte Carlo and especially perfect simulation.

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W.S. Kendall
corrected formulae are tested on some real examples. Price with respect to the price of the underlying. The third and fourth derivative of the classical Black-Scholes epsilon and kappa, are introduced. They correspond to the used to correct the pricing and hedging formulae in the these empirical facts, an asymptotic expansion approach is proof of volatility bursts and fast mean reversion. Based on this, the authors pencil in the statistical introduction to the probabilistic theory of stochastic volatility discusses the latter. Its first half contains a very readable stochastic volatility models emerged. The present book consequence, the world of GARCH modelling together with only an approximative one. Early on, smile effects pointed at Merton (BSM) approach to option pricing and hedging was conditions on constant volatility in the basic Black-Scholes-Merton (BSM) approach to option pricing and hedging was only an approximative one. Early on, smile effects pointed at a need to model beyond this constant volatility. As a result, the world of GARCH modelling together with stochastic volatility models emerged. The present book discusses the latter. Its first half contains a very readable introduction to the probabilistic theory of stochastic volatility modelling. Gradually, the authors pencil in the statistical proofs of volatility bursts and fast mean reversion. Based on these empirical facts, an asymptotic expansion approach is used to correct the pricing and hedging formulae in the classical BSM world. Along the way, two new "Greens", epsilon and kappa, are introduced. They correspond to the third and fourth derivative of the classical Black-Scholes price with respect to the price of the underlying. The corrected formulae are tested on some real examples including more exotic options. The book is well written and makes ideal reading for a graduate course on mathematical finance. The authors took great care in making their ideas clear. I support this text strongly and recommend it for the intended audience.

ETH-Zürich
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P.A.L. Embrechts

NONLINEAR TIME SERIES MODELS IN EMPIRICAL FINANCE. P.H. Franses and D. van Dijk. Cambridge University Press, 2000, pp. xvi + 280, £55.00/US$90.00 Cloth; £19.95/US$31.95 Paper.

Contents:
1. Introduction
2. Some concepts in time series analysis
3. Regime-switching models for returns
4. Regime-switching models for volatility
5. Artificial neural networks for returns
6. Conclusions

Readership: Advanced undergraduate or graduate students having a background in mathematics and econometrics, academics and time-series practitioners seeking an introduction to nonlinear modelling

This textbook provides an up-to-date guide to recently developed models incorporating non-linearity, in particular regime-switching models and artificial neural networks. Nonlinear models allow for the atypical events and asymmetry seen in financial series. A wide range of financial data series are used to illustrate the application of these methods to describe returns on assets and associated volatilities. The models incorporate autoregressive modelling: switching between AR models, with GARCH and its extensions for volatility analysis. Reasons for choosing the models described are given, and this will encourage judicious choices from the massive number of potential nonlinear models. This should reduce dependence on the systematic testing of recipes for a good fit. I can think of no better introduction to nonlinear statistical modelling

Imperial College of Science, Technology and Medicine
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STOCHASTIC CALCULUS AND FINANCIAL APPLICATIONS.

Contents:
1. Random walks and first step analysis
2. First martingale steps
3. Brownian motion
4. Martingales: The next steps
5. Richness of paths
6. Itô integration
7. Localization and Itô’s integral
8. Itô’s formula
9. Stochastic differential equations
10. Arbitrage and SDEs
11. The diffusion equation
12. Representation theorems
13. Girsanov theory
14. Arbitrage and martingales
15. The Feynman-Kac connection
**APPENDIX I: Mathematical Tools**

**APPENDIX II: Comments and Credits**

**Readership:** Anyone with an interest in probability and finance, university level mathematics and probability theory

This is a world of "lovely exercises" that are "very good for the soul", "honest martingales", "bedrock approximations", portfolios that are "born to lose", "intuitive but bogus arguments", and "embarrassingly crude insights". In short, this is a book on stochastic calculus of a different flavour. Intuition is not sacrificed for rigour nor rigour for intuition. The main results are reinforced with simple special cases, and only when the intuitive foundations are laid does the author resort to the formalism of probability. The coverage is limited to the essentials but nevertheless includes topics that will catch the eye of experts (such as the wavelet construction of Brownian motion). This is one of the most interesting and easiest reads in the discipline; a gem of a book.

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Waterloo, Canada
D.L. McLeish

**OPTIMIZATION: FOUNDATIONS AND APPLICATIONS.**


**Contents:**

PART I: Foundations: Linear Methods
1. Matrix algebra
2. Systems of linear equations

PART II: Foundations: Nonlinear Methods
3. Unconstrained maximization and minimization
4. Constrained maximization and minimization

PART III: Applications: Iterative Methods for Nonlinear Problems
5. Solving nonlinear equations
6. Solving unconstrained maximization and minimization problems

PART IV: Applications: Constrained Optimization in Linear Models
7. Linear programming: Fundamentals
8. Linear programming: Extensions
9. Linear programming: Interior point methods

PART V: Applications: Constrained Optimization in Nonlinear Models
10. Nonlinear programming: Fundamentals
11. Nonlinear programming: Duality and computational methods

**Readership:** Operational researchers, mathematical programmers

A more appropriate title for this text would be "Optimization: Foundations and Algorithms"; applications only occur in the exercises. This is a modern book in that it covers linear and nonlinear programming and so is able to include a valuable section on Interior Point Methods. The material is presented in an informal fashion using, where possible, geometric interpretations to support the algebra. The algorithms are described in a well-blended mixture of algebraic and numerical examples. The author is concerned about neither mathematical proofs of convergence nor a practitioner’s interest in when convergence will happen. The author’s extensive teaching experience is reflected in his upbeat, relaxed writing style and presentation. Should you have to teach undergraduate optimization to non-mathematicians this book would be useful. At the end of each chapter there are references and problems. It is a pity that many of the recent survey books and articles are not included in the references.

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S. Powell

**NOTES**


Philip J. Davis is Professor Emeritus of Applied Mathematics at Brown University. He is the author of many books and papers. This volume is in the main his autobiography.

From the book jacket: "The light-hearted anecdotal style entertains while the analytical, yet generally optimistic, approach presents us with monumental questions about the role of mathematics in war and peace and the interaction between mathematics and society. His speculations on the future of mathematics in the light of recent technological possibilities open the question of whether the field will advance or suffer as a result. "Davis’ accounts span the past eighty years, as well as several countries, wars, and changes of societal philosophy. He has studied under Norbert Wiener, worked side-by-side with Ralph Boas, Jr, and was a personal friend of Otto Neugebauer."


From the book jacket: "William Osler was born in a parsonage in backwoods Canada on July 12, 1849. In a life lasting seventy years, he practiced, taught, and wrote about medicine at Canada’s McGill University, America’s Johns Hopkins University, and finally as Regius Professor at Oxford. At the time of his death in England in 1919, many considered him to be the greatest doctor in the world. "Osler, who was a brilliant, innovative teacher and a scholar of the natural history of disease, revolutionized the art of practicing medicine at the bedside of his patients. He was idolized by two generations of medical students and practitioners for whom he came to personify the ideal doctor. But much more than a physician, Osler was a supremely intelligent humanist. In both his writings and his personal life, and through the prism of the tragedy of the Great War, he embodied the art of living. It was perhaps his legendary compassion that elevated his healing talents to an art form and attracted to his private practice students, colleagues, poets (Walt Whitman for example) politicians, royalty, and nameless ordinary people with extraordinary conditions. "William Osler’s life lucidly illuminates the times in which he lived. Indeed, this is a book not only about the evolution of modern medicine, the training of doctors, holism in medical thought, and the doctor-patient relationship, but also about humanism, Victorianism, the Great War, and much else. Meticulously researched, drawing on many new sources and offering new interpretations, William Osler: A Life in Medicine brings to life both a fascinating man and the formative age of twentieth-century medicine. It is a classic biography of a classic life, both authoritative and highly readable."
CARL SAGAN’S COSMIC CONNECTION art and discipline related to early attempts by scholars to society. The astrology of that time is presented as an empirical humously in 1663). Grafton’s book is an engaging scholarly physics, and probability (in a work that appeared post- contributions to mathematics (especially algebra), medicine, the greatest storyteller ever to occupy the Oval Office, Reagan created a compelling public persona that bore little relationship to himself. “Way Out There in the Blue is a ground-breaking history of the American side of the end of the Cold War. Both appalling and funny, it is a black comedy in which Reagan, playing the role he wrote for himself, is the hero.”


Girolamo Cardano (1501-1576) made lasting contributions to mathematics (especially algebra), medicine, physics, and probability (in a work that appeared post-humously in 1663). Grafton’s book is an engaging scholarly study of Cardano’s work on astrology, and its place in his life and society. The astrology of that time is presented as an empirical art and discipline related to early attempts by scholars to understand the universe and their place in it.


From the book jacket: “In 1973, Carl Sagan published The Cosmic Connection, a daring view of the universe, which rapidly became a classic work of popular science and inspired a generation of scientists and enthusiasts. This seminal work is reproduced here for a whole new generation to enjoy. Dr. Sagan, in his typically lucid and lyrical style, discusses many topics from astrophysics and solar system science, to colonization of other worlds, terraforming and the search for extraterrestrials. He conveys his own excitement and wonder, and relates the revelations of astronomy to the most profound human problems and concerns: issues that are just as valid today as they were 30 years ago.

“New to this edition are Freeman Dyson’s comments on Sagan’s vision and on the importance of this work, Ann Druyan’s assessment of Sagan’s cultural significance as a champion of science, and David Morrison’s discussion of the advances made since 1973 and what became of Sagan’s predictions.”


From the book jacket: “Thomas Kuhn’s The Structure of Scientific Revolutions, published in 1962, is among the most important works of our time. It has been translated into twenty-five languages, and the English edition alone has sold more than one million copies. Structure established Kuhn as the century’s most influential philosopher. During the last twenty years of his life, however, Kuhn was radically rethinking the central concepts of that work. When he died in 1996, he left an unfinished sequel to Structure and a plan for this volume, a collection of philosophical essays written since 1970.

“Divided into three parts, The Road since “Structure” is the fullest record we now have of the new direction Kuhn was taking during the last two decades of his life. The first part of the book consists of self-standing essays in which Kuhn refines the basic concepts set forth in Structure – paradigm shifts, incommensurability, and the nature of scientific progress. In part two, Kuhn replies at length to criticisms of his earlier work. Here the reader will find him arguing his position with many of his eminent contemporaries, including Paul Feyerabend, Karl Popper, Carl Hempel, and Charles Taylor.

“The third part of the volume is the transcript of a remarkable autobiographical interview with Kuhn conducted in Athens in 1995, not quite a year before his death. Here, the usually reticent Kuhn discusses his own intellectual development – his family and upbringing, his education, the influence of his training as a physicist, his war work, his relations with his colleagues, the responses to Structure – as well as his struggles to define his philosophical position both before and after that landmark work.”


From the book jacket: “This beautiful volume deals with eclipses of all kinds – lunar, solar and even those elsewhere in the Solar System. Bringing together in one place all aspects of eclipses, and lavishly illustrated throughout, Glorious Eclipses covers the history of eclipses from ancient times, the celestial mechanics involved, their observation and scientific interest. Personal accounts are given of recent eclipses, up to and including the last total eclipse of the twentieth century: the one on August 11th 1999 that passed across Europe, Romania, Turkey and India. This unique book contains the best photographs taken all along its path and is the perfect souvenir for all those who tried or wished to see it. In addition, it contains all you need to know about forthcoming eclipses up to 2060, complete with NASA maps and data, making it the perfect resource for both novice and veteran eclipse-chasers.”


From the back cover: “In the past decade, officials responsible for cleanup of contaminated groundwater have increasingly turned to natural attenuation – essentially allowing naturally occurring processes to reduce the toxic potential of contaminants – versus engineered solutions. This saves both money and headaches. To the people in surrounding communities, though, it can appear that cleanup officials are simply walking away from contaminated sites.

“The book explores how contamination occurs, explaining concepts and terms, and includes case studies from the Hanford nuclear site, military bases, and other sites. It provides historical background and important data on clean-up processes and goes on to offer critical reviews of fourteen published protocols for evaluating neutral attenuation.”
From the book cover: "Mountain meteorology: Fundamentals and Applications" offers an introduction to the basic principles and concepts of mountain weather and explores their applications to natural resources management. It emphasizes observable indicators of atmospheric processes, such as winds, temperature, and clouds, in order to facilitate readers’ recognition of weather and events. More than two hundred figures, diagrams and photographs, many in full color, illustrate the book.

From previous reviews:

"This brilliant and restless celebration of cultural plurality is a godsend for those countless individuals who compulsively voyage between real and imaginary homes, both past and present. Pico Iyer offers them (or, if truth be told, us) a collective Identity – "global souls"." Caryl Phillips, author of Cambridge

"The Global Soul takes the genre of travel writing as far as it can go... A world where no place is foreign and the most puzzling person one meets on the journey is oneself." Richard Rodriguez, author of Hunger of Memory

From the book jacket: "Beyond Six Billion illuminates not only the forces that shape population growth but also the accuracy of the methods we use to quantify these forces and the uncertainty surrounding projections."

HITLER'S GIFT. SCIENTISTS WHO FLED NAZI GERMANY.

From the book jacket: "If the dismissal of Jewish scientists means the annihilation of contemporary German science, then we shall do without science for a few years.' "With these words Hitler closed the door on Germany's fifty-year record of world supremacy in science. The exodus of German and Austrian scientists, mostly Jewish, that followed caused critical damage to Germany's scientific output and brought invaluable gains to the West. The Third Reich's losses included the leading physicists who became the driving force behind the atomic bomb project.

"Britain played the major role in rescuing the scientists and, within weeks of the dismissals, leading British academics had set up an agency to support the exiles and help them find jobs. Of 1,500 refugees, twenty went on to win Nobel Prizes. Among them were the co-discoverer of penicillin, the physician who revolutionized the treatment of paraplegics, and Max Perutz who discovered the atomic structure of the haemoglobin molecule, with all its implications for how oxygen is taken round the body.

"The gripping individual stories of emigration, rescue and escape include that of Einstein, the world's most famous scientist; Fritz Haber, the German-Jewish patriot who galvanized Germany's war effort in 1914-18, only to be forced out by Hitler; and Leo Szilard, restless genius who disproved the scientific establishment's belief that atomic chain reactions were 'moonshine'. The dilemmas of those who stayed are equally dramatic: Max Planck, German scientist father-figure, who could not believe the new regime would last; Werner Heisenberg, brilliant inventor of the Uncertainty Principle, whose wartime record is still controversial; and Max von Laue, revered for his heroic opposition to the Third Reich.

"Medawar and Pyke describe the wartime internment and deportation of many refugee scientists, classed as enemy aliens although implacably opposed to the Nazis. The invention of the bomb is told in the context of the refugees' crucial contribution."

"The authors drew much of their material from interviews with more than twenty surviving refugee scholars to create a moving account of the scientific diaspora which resulted from Hitler's policy. As one refugee scientist wrote, 'Far from destroying the spirit of German scholarship, the Nazis had spread it all over the world. Only Germany was to be the loser.'"

From a review: "Hitler's Gift to Britain and America was talent, more valuable than gold – that is the message of this inspiring book" M.F. Perutz

From the book jacket: "Science fascinates us by its power to surprise. Occasionally, unexpected results that appear to violate accepted laws of nature can herald revolutionary advances in human knowledge. Many 'revolutionary' discoveries turn out to be wrong, however, and even eminent scientists have had their careers tarnished, mistakenly thinking that they have made a great discovery. This is pathological science, in which scientists are subject to self-delusion. And if scientists can sometimes fool themselves, how much easier it is to craft arguments deliberately intended to befuddle jurists with little or no scientific background. This is junk science, typically consisting of theories of what could be so, with little supporting evidence to prove that it is so.

"Sometimes there is no evidence at all. Ancient beliefs in demons and magic still sweep across the modern landscape, but they are now dressed in the language and symbols of science. This is pseudoscience, which its practitioners may believe to be science, just as witches and faith healers may believe they can call forth supernatural powers.

"What may begin as an honest error, has a way of evolving from self-delusion to fraud. As Robert Park points out, the line between foolishness and fraud is thin, and because it is not always easy to tell when that line is crossed, he uses the term voodoo science to cover them all: pathological science, junk science, pseudoscience, and fraudulent science. His book is intended to help the reader recognize voodoo science and to understand the forces that conspire to keep it alive.

"Scientists, Park observes, insist that the cure for voodoo science is to raise the level of scientific literacy. But what is it that a scientifically literate society should know? It is not specific knowledge of science the public needs, Park argues, so much as a scientific world view – an understanding of theories of what could be so, with little supporting evidence to prove that it is so.

"Yet, their responses to the use of the atom bomb, the testing of the hydrogen bomb, and the treachery of domestic politics differed markedly. Bethe, who drew confidence from scientific achievement and integration into the physics community, preserved a deep integrity. By accepting a modest role, he continued to influence policy and contributed to the nuclear test ban treaty of 1963. In contrast, Oppenheimer first embodied a new scientific persona – the scientist who creates knowledge and technologies affecting all of humanity and boldly addresses their impact – and then could not carry the burden of this persona. His desire to retain insider status, combined with his isolation from creative work and collegial scientific community, led him to compromise principles and, ironically, to lose prestige and fall victim to other political insiders.

"Schweber draws on his vast knowledge of science and its history – in addition to his unique access to the personalities involved – to tell a tale of two men that will enthral readers interested in science, history, and the lives and minds of great thinkers."


From the book jacket: "Pills, Potions and Poisons provides in clear, non-technical language an account of how medicines and other drugs work in the body, with historical, often amusing anecdotes about the discovery of drugs and the people behind their discovery. It covers all the major groups of drugs, with complete listings of specific drugs available in both the UK and USA. Individual chapters deal with drugs to treat high blood pressure, heart disease, diabetes, nausea, vomiting, diarrhoea, constipation, ulcers, cancers, infections, impotence, incontinence, arthritis, and osteoporosis, as well as hormone replacement therapy and oral contraceptives. There are chapters on the drugs used for treating disorders of the brain, such as schizophrenia, depression, Parkinson's disease, Alzheimer's disease, and epilepsy. There is coverage too of substances of recreation and abuse, and of some of the poisons we can encounter, including the venoms of snakes, spiders, scorpions, and marine organisms."


From the book cover: "The pendulum of environmental policy swings back and forth from one extreme to the other, depending on which camp is in power and who has the ear of the media. Neglect is followed by overkill. Concern breeds action; disillusionment breeds reaction. The Environmental Pendulum provides a thoughtful and evenhanded assessment of this chronic conflict."

TECHNOLOGICAL INNOVATION AS AN EVOLUTIONARY PROCESS. J. Ziman (Ed.). Cambridge University Press, 2000, pp. xvii + 379, £40.00/US$64.95.

From the book cover: "The central idea of this book is very simple. Of the innumerable inventions that are put on the market, only the few that survive the test of use are reproduced. Stone axes, bicycles, medicines, jet aircraft and other technological artefacts thus 'evolve' in much the same way as biological organisms. What can we learn about technological innovation by thinking of it as a cyclic process of variation and selection, analogous to Darwinian evolution?"
For the first time, leading experts from many disciplines discuss this metaphor thoroughly in non-technical language, showing how it throws completely new light on many aspects of social and economic change, with many practical policy implications.


From the book cover: “The birth of modern IT in the second half of the 20th century marked a time of exploring and demonstrating basic capabilities. Today the expectations are changing as IT plays a more prominent role in commerce, education, and daily life and as growing numbers of people and organizations become reliant on IT systems. The kinds of research investments needed to advance information technology in the early 21st century are also evolving. What major advances are needed to ensure that IT systems will reliably support a growing range of applications? How hard will it be to achieve such advances? Whose expertise is needed to realize them?”

“Making IT Better addresses these questions by examining trends in IT research and development. It recommends an expansion in the scope of future research, examines the implications of this expansion, and proposes new mechanisms for bringing together a more diverse set of researchers.”

IRRATIONAL EXUBERANCE. R.J. Shiller.

From the book jacket: “In this bold and potentially urgent volume, Robert J. Shiller, a respected expert on market volatility, offers an unconventional interpretation of recent U.S. stock market highs and shows that Alan Greenspan’s term ‘irrational exuberance’ is a good description of the mood behind the market. He warns that poorer performance may be in the offing and tells us how we – as a society and individually – can respond.”

THE PHYSICS OF INFORMATION TECHNOLOGY.

From the book jacket: “The familiar devices that we use to collect, transform, transmit, and interact with electronic information operate surprisingly close to very many fundamental physical limits. A hand-held GPS receiver requires special and general relativistic corrections to the time reported by the system’s atomic clocks; the typical distance between air molecules in a hard disk drive is larger than the height that the head flies above the platter; the linewidth in a VLSI circuit is approaching the size of a single atom; the performance of satellite receivers is limited by the echo of the Big Bang.

“Given the economic and intellectual importance of these scaling limits, surprisingly few people are equipped to address them. Understanding how such devices work, and how they can (and cannot) be improved, requires deep insight into the character of physical law as well as engineering practice. The Physics of Information Technology provides this needed connection by introducing underlying governing equations and then deriving operational device principles. This self-contained volume will help both physical scientists and computer scientists see beyond the conventional division between hardware and software to understand the implications of physical theory for information manipulation. It is at this interface that many of the most dramatic advances in both domains are occuring.

“The books starts with an introduction to units, forces, and the probabilistic foundations of noise and signalling, then progresses through the electromagnetics of wired and wireless communications, and the quantum mechanics of electronic, optical, and magnetic materials, to discussions of mechanisms for computation, storage, sensing, and display. Attention is drawn throughout to the remarkable opportunities associated with more closely integrating the physical and logical descriptions of classical and quantum information.”

CHAOS OF DISCIPLINES. A. Abbott.
University of Chicago Press, 2001, pp. xvi + 259, US$54.00/£34.50 Cloth; US$17.00/£11.00 Paper.

[The author] presents a fresh and daring analysis of the evolution and development of the social sciences. Chaos of Disciplines reconsider how knowledge actually changes and advances. Challenging the accepted belief that social sciences are in a perpetual state of progress, Abbott contends that disciplines instead cycle around an inevitable pattern of core principles. New schools of thought, then, are less a reaction to an established order than they are a reinvention of fundamental concepts.

“Chaos of Disciplines” uses fractals to explain the patterns of disciplines, and then applies them to key debates that surround the social sciences. Abbott argues that knowledge in different disciplines is organized by common oppositions that function at any level of theoretical or methodological scale. Opposing perspectives of thought and method, then, in fields ranging from history, sociology, and literature, are to the contrary, radically similar; much like fractals, they are each mutual reflections of their own distinctions. Abbott extends this concept to social structure and moral action in the book’s closing chapters. He demonstrates how self-similar social structures arise, considers their implications for individual experience and solidarity, and then shows how self-similarity makes sense of the debate over politicization in academia; ultimately, Chaos of Disciplines contends that the political wars in the humanities and social sciences involve far less disagreement than we think.”


[Noted, Short Book Reviews, Vol. 20, p. 15]


GOVERNMENT PUBLICATIONS


UNITED NATIONS STATISTICAL OFFICE PUBLICATIONS RECENTLY ISSUED


COLLECTED PAPERS, TABLES AND PROCEEDINGS

ADVANCES IN STOCHASTIC SIMULATION METHODS. N. Balakrishnan, V.B. Melas and S. Ermakov (Eds.). Boston: Birkhäuser, 2000, pp. xxvi + 386, SFr148.00/DM178.00/ÖS1300.00.

APPLICATIONS OF DIFFERENTIAL GEOMETRY TO ECONOMETRICS. P. Marriott and M. Salmon (Eds.). Cambridge University Press, 2000, pp. viii + 324, £45.00/US$74.95.


HIGH-DIMENSIONAL PROBABILITY II. E. Giné, D. Mason and J. Wellner (Eds.). Boston: Birkhäuser, 2000, pp. x + 510, SFr198.00/DM238.00/ÖS1738.00.


RECENT ADVANCES IN RELIABILITY THEORY. Methodology, Practice, and Inference. N. Limnios and M. Nikulin (Eds.). Boston: Birkhäuser, 2000, pp. xxv + 514, SFr198.00/DM238.00/ÖS1738.00.

ROBUST BAYESIAN ANALYSIS. D.R. Insua and F. Ruggeri (Eds.). New York: Springer-Verlag, 2000, pp. xiii + 422, US$59.95/DM119.00/£43.00.


BOOKS RECEIVED


TAPHONOMY. A Process Approach. R.E. Martin. Cambridge University Press, 1999, pp. xvi + 508, £65.00/US$100.00 Cloth; £27.95/US$44.95 Paper.


TOPICS IN FINITE AND DISCRETE MATHEMATICS. S.M. Ross. Cambridge University Press, 2000, pp. ix + 265, £52.50/US$85.00 Cloth; £18.95/US$29.95 Paper.

