Short Book Reviews

Vol. 15. No. 2— August 1995 **Editor Dr. A.M. Herzberg**

THEORY OF THE COMBINATION OF OBSERVATIONS LEAST SUBJECT TO ERROR. C.F. Gauss. Translated by G.W. Stewart. Philadelphia: Society for Industrial and Applied Mathematics, 1995, pp. xi + 241.

Contents:

1. Translator's introduction
2. Pars prior/Part one
3. Pars posterior/Part two
4. Supplementum/Supplement
5. Anzeigen/Notices

Afterword

Readership: Statisticians, probabilists, numerical analysts, historians of science

Gauss published his first work on least squares in 1809, but his mature reconsideration of the subject was published over a decade later, in Latin and in parts, as Theoria Combinationis Observationum Error-ibus Minimis Obnoxiae (1823-1828). In 1855 Joseph Bertrand translated this (and Gauss's other works on least squares) into French, and that French translation served as the source for later translations into German (1887) and English (by Hale Trotter in 1957, but only circulated in mimeograph form). G.W. Stewart has per-formed for the profession a signal service by providing an all new translation from the Latin of the Theoria Combinationis.

This work of Gauss's is the source of what has come to be known as the "Gauss-Markov Theorem", as well as many other elegancies (such as a Chebychev-like in-equality that Richard Savage wrote about in 1961 in the U.S. NBS Journal of Research 65 B:211-222). The translation is exceedingly well done, with the Latin original being presented on facing pages. It flows easily for a modern reader, and historians can consult the facing original for reassurance that this flow has not been bought at the cost of accuracy. The Contem-porary German 'Notices' (essentially, abstracts) are also included. The regrettable lack of an index is par-tially recompensed by an excellent, detailed table of contents that amounts to a section-by-section synopsis of the work. Stewart has added an Afterword that sets the work in an historical context. It is a pleasure to see Gauss back in print in such a splendid edition.

University of Chicago
Chicago, U.S.A. S.M. Stigler

STATISTICS AND THE EVALUATION OF EVIDENCE FOR FORENSIC SCIENCE. C.G.G. Aitken. Chichester, U.K.: Wiley, 1995, pp. xv + 260, £35.00.

Contents:

1. Uncertainty in forensic science
2. The evaluation of evidence
3. Variation
4. Historical review
5. Transfer evidence
6. Discrete data
7. Continuous data
8. DNA profiling

Readership: Forensic scientists

The book is timely: with the recent contro-versy over the statistical interpretation of DNA pro-file evidence, forensic scientists are becoming more aware both of the role of statistics in their work and of the subtlety of many statistical ideas. Students of statistics will also find that forensic science pro-vides a fascinating field of application, not least because even the most hardened anti-Bayesian must con-cede that the Bayesian approach to inference is well suited here, in contrast with frequentist approaches which lead to substantial difficulties.

Aitken introduces elements of Bayesian statistical inference in an informal way, accessible to those with little mathematical background. The theory is illustrated with examples of transfer evi-dence such as hair, glass fragments and DNA profiles. It is on the latter topic that the book is most disap-pointing. The author ignores the genetic correlations which are crucial to an appropriate analysis and is consequently led to the slippery concepts of a "random" person drawn from a "relevant population": these con-cepts are not needed and cause confusion. The fallacy that the ethnicity of the suspect is irrelevant to in-ference is asserted repeatedly: a careful analysis shows that the ethnicities of both the suspect and the possible culprits are relevant to inference. Kernel density estimation is advocated inappropriately when the underlying density is, due to population genetics, very spiky. The book has much to recommend itself to forensic scientists as an introduction to relevant statistical ideas, but a much-needed thorough stati-stical treatment of DNA profile evidence is still awaited.

Queen Mary and Westfield College
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CLINICAL BIOSTATISTICS: AN INTRODUCTION TO EVIDENCE-BASED MEDICINE. G. Dunn and B. Everitt. London: Arnold, 1995, pp. vi + 154.

Contents:

1. Clinical problems and statistical solutions
2. Diagnosis, probability and sampling
3. The variability of clinical measurements
4. Sampling and estimation
5. The search for associations
6. Treatment trials

Postscript: Hypothesis testing and P-values

Readership: Medical researchers, biostatisticians

This book is intended as a main text for a course on the critical appraisal of statistical evidence in a medical context. It is intentionally nontechnical and contains very few formulae. Rather, the focus is on many of the key concepts arising in the interpretation of statistical evidence in medical studies. The chapters are easy to read and thus make this a very approachable book for medical investigators who wish to gain a greater appreciation of the topic.

Harvard University
Boston, U.S.A. S.W. Lagakos

STATISTICAL DESIGN AND ANALYSIS IN PHARMACEUTICAL SCIENCE. S. Chow and J. Liu. New York: Dekker, 1995, pp. viii + 557, US$150.00.

Contents:
1. Introduction
2. Assay development
3. Assay validation
4. Scaleup design and analysis
5. USP tests and specifications
6. Process validation
7. Quality assurance
8. Stability studies
9. Accelerated testing
10. Design for long-term stability studies
11. Stability analysis with fixed batches
12. Stability analysis with random batches

Readership: Statisticians involved in the pharmaceutical industry; pharmaceutical scientists and pharmacists

This book aims to give a comprehensive pre- sentation and discussion of designs and analyses used in drug development, including those relevant to assay development and validation, process validation, quality assurance, stability assessment, and accelerated testing. Numerous examples are used to illustrate the methods that are presented. A basic knowledge of re-gression and analyses of variance is assumed. This text appears to be a useful reference for practitioners as well as a good source for statisticians wishing to understand some of the key issues in these aspects of drug development.
Harvard University
Boston, U.S.A. S.W. Lagakos

META-ANALYSIS, DECISION ANALYSIS, AND COST-EFFECTIVENESS ANALYSIS: METHODS FOR QUANTITATIVE SYNTHESIS IN MEDICINE. D.B. Petitti. New York: Oxford University Press, 1994, pp. x + 216, US$45.00.

Contents:
1. Introduction
2. Overview of the methods
3. Planning the study
4. Information retrieval
5. Data collection
6. Advanced issues in meta-analysis
7. Statistical methods in meta-analysis
8. Other statistical issues in meta-analysis
9. Complex decision problems
10. Estimating probabilities
11. Utility analysis
12. Advanced cost-effectiveness analysis
13. Sensitivity analysis
14. Reporting results
15. Limitations

Readership: Epidemiologists, biostatisticians, researchers working with meta-analysis

The aim of this book is to bring together three research areas, meta-analysis, decision analysis and cost-effectiveness analysis, that are integral parts of policy recommendations in medicine. Each area is described and then used in an integrated way in case studies which are designed as prototype analyses. The descriptions of the three areas are not treated too expansively, since each would require a book-length description; thus some prior knowledge is important. However, the descriptions are helpful in pin-pointing additional reading. Although the book is designed for a medical audience, the methodology can be transferred to other contexts, in order that the methodology will be of interest to a broader audience.

Stanford University
Stanford, U.S.A. I. Olkin

THE PLEASURES OF PROBABILITY. R. Isaac. New York: Springer-Verlag, 1995, pp. xv + 241, DM.48.00/ ÖS.374.40/Sw.fr.48.00.

Contents:
1. Cars, goats, and sample spaces
2. How to count: Birthdays and lotteries
3. Conditional probability: From kings to prisoners
4. The formula of Thomas Bayes and other matters
5. The idea of independence, with applications
6. A little bit about games
7. Random variables, expectations, and more about games
8. Baseball cards, the law of large numbers, and bad news for gamblers
9. From traffic to chocolate chip cookies with the Poisson distribution
10. The desperate case of the gambler's ruin
11. Breaking sticks, tossing needles, and more: Probability on continuous sample spaces
12. Normal distributions, and order from diversity via the central limit theorem
13. Random numbers: What they are and how to use them
14. Computers and probability
15. Statistics: Applying probability to make decisions
16. Roaming the number line with a Markov chain: Dependence
17. The Brownian motion, and other processes in continuous time

Readership: General readers with good high school mathematics, teachers

As the chapter headings show, this is not about the masochistic pleasures of gambling, but is an introduction to the ideas of probability using the ex-amples that we employ to keep our classes alert and entertained. Most of the classics are here: the birth-day problem, the prisoner's dilemma, the coupon col-lector's problem, Buffon's needle problem, etc., ex-tending as far as the Hardy-Weinberg law. Surprisingly, Simpson's paradox is missing. These examples are clearly explained, the mathematics is informal and almost everywhere simple, calculus being mentioned only briefly. The general reader, who is new to the mathe-matics of probability, and not interested primarily in its

application, will find a feast here. The teacher will have on his shelf a useful collection of examples.
A quibble at the editorial level is that a solidus / is used for conditioning, instead of a verti-cal rule |, so that we have, for example, P(U/V)=2/3.

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Technology and Medicine
London, U.K. R. Coleman

CONTINUOUS UNIVARIATE DISTRIBUTIONS, Volume 2,
2nd edition. N.L. Johnson, S. Kotz and
N. Balakrishnan. New York: Wiley, 1995,
pp. xix + 719, £70.00.

Contents:
22. Extreme value distributions
23. Logistic distribution
24. Laplace (double exponential) distributions
25. Beta distributions
26. Uniform (rectangular) distributions
27. F-distributions
28. t-distributions
29. Noncentral ^{2}-distributions
30. Noncentral F-distributions
31. Noncentral t-distributions
32. Distributions of correlation coefficients
33. Lifetime distributions and miscellaneous orderings

Readership: Pure and applied statisticians, researchers in continuous distribution theory, scientists who use distributions

Volume 1 of the second edition of Continuous Univariate Distributions was reviewed in Short Book Reviews, Vol. 15, p.25. As one might expect, all the general comments in that review apply equally well to Volume 2, which has the same style, structure, and approach as Volume 1. In particular, the average chap-ter length is again about double that of the first edition and the number of references has trebled. The chapter numbering now corresponds rather less well with the first edition, partly as a consequence of changes in Volume 1 and the decision to delay revision of the chapter on quadratic forms to the projected multivari-ate volume. The final chapter, previously entitled Miscellaneous Distributions, has been very substan-tially revamped and more narrowly focused; it is now entitled Lifetime Distributions and Miscellaneous Orderings.
These two volumes, together with the 1992 'discrete' revision by Johnson, Kotz and Kemp (A.W.) [Short Book Reviews, Vol. 13, p.17], now form a re-markably comprehensive, up-to-date, and indispensable guide to univariate distributions. We look forward eagerly to the projected 'multivariate' revision. All the authors deserve both our congratulations and our gratitude.

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St. Andrews, U.K. C.D. Kemp

PROBABILITY FOR ANALYSTS. K.R. Stromberg. Based on lecture notes taken and processed by K. Ravindran.
New York: Chapman and Hall, 1994, pp. x + 330, £49.00.

Contents:
1. Fourier transforms on R^d
2. Weak convergence on $M_1(R^d)$
3. Independence

APPENDIX: Hopf's Extension Theorem
4. Infinite series of random vectors
5. Normal distributions and central limits

APPENDIX: Some Applications of Probability to Analysis
6. Martingales
7. Projective limits and infinite products of probability measures

APPENDIX: Products of Probability Spaces
8. Brownian motions

APPENDIX: Which Martingales are Brownian Motions?
9. Random Fourier series of continuous functions
10. Fourier coefficients of continuous functions

Readership: Probabilists and analysts

Over recent years, various books on the inter-play between analysis and probability have appeared; see for instance Durrett's Brownian Motion and Martin-gales in Analysis, [Short Book Reviews, Vol. 5, p.7] or Dudley's Real Analysis and Probability, [Short Book Reviews, Vol. 9, p.46]. For a long time already, analysts have realized that probabilistic methods are useful tools in studying various problems in analysis. I am for instance thinking of the analysis of PDE's, Fourier analysis, optimization problems and inequal-ities. The present book offers students in analysis the basic probability which they would need in tackling such problems. A very concisely written text, augmented by numerous good exercises and discussions on histori-cal perspectives yields an excellent set of material useful for this purpose. Also probabilists will find many of the topics treated interesting. I have no reservation in recommending this book for the intended audience.

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

PROBABILISTIC TECHNIQUES IN ANALYSIS. R.F. Bass.
New York: Springer-Verlag, 1995, pp. xii + 392,
DM.82.00/ÖS.6339.60/Sw.fr.79.00.

Contents:
1. Probability
2. Potential theory
3. Lipschitz domains
4. Singular integrals
5. Analytic functions

Readership: Probabilists and analysts

In my review of Stromberg's Probability for Analysts [Short Book Reviews, Vol. 15, p.43] I already stressed the growing number of books treating the interplay between analysis and probability. Here is one more, also written by a distinguished researcher in the field. And again, an interesting text emerges. After giving the necessary background material in Chapters 1 and 2, the author embarks on a discussion of applications of probabilstic techniques to problems in analysis all being established as from 1970. In that sense, the book is perhaps a bit more specialized than some of its competitors. This is however compensated by the fact that this allows for a more in-depth dis-cussion of the treated analysis problems. Numerous ex-ercises enliven the presentation. The research student will welcome the various open problems presented making the text useful for a broad, but necessarily highly dedicated, readership.

ETH-Zentrum
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MULTILEVEL STATISTICAL MODELS. H. Goldstein. London:
Arnold, 1995, pp. viii + 178, £29.99.

Contents:

1. Introduction
2. The basic linear multilevel model and its estimation
3. Extensions to the basic multilevel model
4. The multivariate multilevel model
5. Nonlinear multilevel models
6. Models for repeated measures of data
7. Multilevel models for discrete response data
8. Multilevel cross classification
9. Multilevel event history models
10. Multilevel models with measurement errors
11. Software for multilevel modelling; missing data and multilevel structural equation models

Readership: Statisticians, educational and social researchers, medical researchers, psychologists

This book first appeared in 1987 as Multilevel Models in Educational and Social Research [Short Book Reviews, Vol. 8, p.2]. Then it had ninety-eight pages and seven chapters; this extension has been quite sub-stantial. It reflects the growth of interest in the area since 1987, as well as the considerable research effort over that time. Particular new developments in-cluded in this edition are work on discrete response data, time series models, random cross-classifications, errors of measurement, missing data, nonlinear models, and a discussion of available software. As in the pre-vious edition, the theoretical presentation is en-livened with many examples. The dropping of the quali-fying phrase from the title of the first edition is fitting since this class of model is of wider interest than merely to educational and social researchers. In summary, this book is an elegant outline of a class of statistical models and ideas which are becoming of increasing relevance and importance. It is nicely produced and clearly written.

The Open University
Milton Keynes, U.K. D.J. Hand

RECENT ADVANCES IN DESCRIPTIVE MULTIVARIATE ANALYSIS. W. Krzanowski (Ed.). Oxford: Clarendon Press, 1995, pp. ix + 362, £35.00.

Contents:

1. Clustering from the perspective of combinatorial data analysis, by P. Arabie and L.J. Hubert
2. Developments in principal component analysis, by B.D. Flury
3. Canonical discriminant analysis: Comparison of resampling methods and convex hull approximations, by C. Weihs
4. Nonlinear methods for the analysis of homogenicity, and heterogeniety, by W.J. Heiser and J.J. Meulman
5. Principal component models for patterned covariance matrices, with applications to canonical correlation analysis of several sets of variables, B.D. Flury and B.E. Neuenschwander
6. Othogonal and projection Procrustes analysis, by J.C. Gower
7. Graphical modelling, by D. Edwards
8. Convergent computation by iterative majorization: Theory and applications in multidimensional analysis, by W.J. Heiser
9. Biplot display of multivariate categorical data, with comments on multiple correspondence analysis, by K.R. Gabriel
10. MANOVA biplots for two-way contingency tables, by K.R. Gabriel
11. Some tools for the multivariate analysis of functional data, by J.O. Ramsey
12. A general theory of biplots, by J.C. Gower

Readership: Statisticians and students of statistics

This book arose from a seminar series, spon-sored by the University of Exeter and Shell Research Limited, in which leading researchers in various areas of descriptive multivariate analysis each presented several talks reviewing recent work in their area. The aim of the book is to bring statisticians who want to learn about the current frontiers of research in the area of descriptive multivariate analysis up to the frontier. In this, the book succeeds.

Inevitably, in reviewing a book with the aims of this one, one will seek topics which have been omit-ted. Two such topics are modern exploratory methods and visualization methods. However, it turns out that both of these were covered by the seminar series, by C. Weihs and F. Young, respectively, but have been pub-lished elsewhere. In terms of the completeness of coverage of the present volume, this is a pity.

Also inevitably, there is some unevenness in depth of coverage and range of the topic treated by each of the contributors. For example, Weihs describes 'the examination of criteria for judging the predictive power of canonical discriminant analysis'. Contrast this with Edwards' overview of the whole of the now large field of graphical models and Gower's 'general theory of biplots'.

The book is the second in the Royal Statisti-cal Society Lecture Notes Series. It is a worthy ad-dition to that series. It would make a good supplemen-tary text for a course on modern multivariate descrip-tive methods.

The Open University
Milton Keynes, U.K. D.J. Hand

RELIABILITY ASSESSMENT OF ELECTRICAL POWER SYSTEMS USING MONTE CARLO METHODS. R. Billinton and W. Li. New York: Plenum Press, 1994, pp. xvi + 351.

Contents:

1. Introduction
2. Basic concepts of power system reliabilityevaluation
3. Elements of Monte Carlo methods
4. Generating system adequacy assessment
5. Composite system adequacy assessment
6. Distribution system and station adequacy assessment
7. Reliability cost/worth assessment

Readership: Electrical engineers

With the development of faster and faster computers, the sky has really become the limit, at least, this is what the authors seem to be suggesting. Power system behaviour has traditionally been analyzed and designed on the basis of a deterministic framework. It is only recently that the inherent stochastic nature of power provision has been accounted for in design. Clearly, Monte Carlo methods are nicely suited to eval-uate reliability properties and other related network characteristics. Therefore, the authors devote a sub-stantial part of their book to Monte Carlo techniques, starting from first principles. The remainder of the book focuses on various types of analyses for different types of systems. It is supplemented by numerical ex-amples and plenty of attractive graphs. This book is not designed for statisticians: readers with interest in probabilistic modeling would be disappointed not to find the expected in-depth material and/or references. However, the book will be valuable as an introduction to stochastic methods for practising electrical engineers.

University of Calgary
Calgary, Canada M.A. Maes

SYSTEM RELIABILITY THEORY. Models and Statistical Methods. A. Høyland and M. Rausand. New York: Wiley, 1994, pp. x + 518, £59.00.

Contents:

1. Introduction
2. Failure models
3. Qualitative system analysis
4. Systems of independent components
5. Component importance
6. Markov models
7. Counting processes
8. Dependent failures
9. Life data analysis
10. Accelerated life testing
11. Bayesian reliability analysis
12. Reliability data sources

Readership: Reliability engineers, statisticians

This book provides a quite comprehensive treatment of system reliability theory and methods. It is especially good in its discussion of stochastic models and of structural analysis of systems and con-tains many practical illustrations and useful inform-ation on software. This material covers eight chapters and about three hundred and fifty pages. There are also three chapters (9-11) on statistical analysis, com-prising about one hundred and ten pages, and a short final chapter on reliability data sources. The book is a valuable addition to the reliability literature.

University of Waterloo
Waterloo, Canada J.F. Lawless

THE WEIGHTED BOOTSTRAP. P. Barbe and P. Bertail. New York: Springer-Verlag, 1995, pp. 230.

Contents:

1. Asymptotic theory for the generalised bootstrap of statistical differentiable functionals
2. How to choose the weights
3. Some special forms of the weighted bootstrap
4. Proofs of results of Chapter 1
5. Proofs of results of Chapter 2
6. Proofs of results of Chapter 3

Eight appendices

Readership: Research statisticians

With the standard Efron bootstrap, members of a bootstrap sample are drawn by randomly sampling with replacement from the original sample of data and are present in proportions which are determined by a uni-form multinomial distribution on the original sample values. A generalized or weighted bootstrap is obtained by requiring only that the number of times that values of data are resampled form an exchangeable sequence. This monograph is concerned with conditions for asymp-totic consistency of the weighted bootstrap and with questions related to appropriate choice of the ex-changeable sequence in particular contexts. The presen-tation is clear, but as might be expected of a research monograph, the treatment is highly technical and dense, with over half the monograph devoted to detailed proofs of the main results. It is a book for the specialist only. Though the book will be found useful by some, the overall level of finish is rather weak, with numerous misspellings, errors in the references, etc.

University of Cambridge
Cambridge, U.K. G.A. Young

PARAMETRIC STATISTICAL THEORY. J. Pfanzagl. With the assistance of H. Hamböker. Berlin: Walter de Gruyter, 1994, pp. xiii + 374.

Contents:

1. Sufficiency and completeness
2. The evaluation of estimators
3. Mean unbiased estimators and convex loss functions
4. Testing hypotheses
5. Confidence procedures
6. Consistent estimators
7. Asymptotic distribution of estimator sequences
8. Asymptotic bounds for the concentration of estimators and confidence bounds
9. Miscellaneous results and asymptotic distributions
10. Asymptotic test theory

Readership: Graduate students and researchers in mathematical statistics

Among the numerous books that appear on parametric statistical inference, the present one is of an outstandingly high mathematical level. The author presents the theory of estimation and testing in para-metric models assuming good knowledge of measure theory and probability theory. Some, but not all, of these prerequisites are summarized in appendices to some of the chapters. They include for instance: conditional expectation, uniform integrability, uniform stochastic convergence, measurable selection, weak convergence. Chapter 1 of the book gives the basic concepts of the whole theory: sufficiency, completeness, exponential families, equivariance, invariance. From there, the theory of parametric inference for independent and identically distributed observations is developed and the optimality of the estimators and tests is discus-sed. Both exact and first-order asymptotic results are given. A nice thing about the book is that throughout there are many examples and some exercises which bring the reader from some abstract space back into the familiar parameter spaces of gamma and normal den-sities. The bibliography contains more than two hundred and fifty items. Some of these go back to the early history and are commented on by the author.

Limburgs Universitaire Centrum
Diepenbeek, Belgium N. Veraverbeke

DISTRIBUTION-FREE STATISTICAL METHODS, 2nd edition. J.S. Maritz. London: Chapman and Hall, 1995, pp. xii + 255, £25.00.

Contents:

1. Basic concepts in distribution free methods
2. One-sample location problems
3. Miscellaneous one sample problems
4. Two sample problems
5. Straight line regression
6. Multiple regression and general linear models
7. Bivariate problems
8. Miscellaneous complements (linearization representation; asymptotic relative efficiency; estimating equations and the smoothing of statistics; least squares smoothing; kernel gradient estimates; bootstrap estimation of standard errors; conditional standard errors)

Readership: Those who want an introductory course in

these methods. Nominally, undergraduate students

The author points out early (p.2) that "Few of the so-called distribution-free methods are truly distribution-free." They do require at least mild assumptions. Randomization is a unifying notion here and there is emphasis on problems of location and location shift.
Remarkably, the second edition is about ten pages shorter than the first! This is due to a smaller print size, and the text is slightly expanded with more examples and data. Also, the author has added a new Chapter 8. The table of contents is now very detailed, but the main topics of Chapters 1 to 7 remain the same.
A few exercises have been added and a few removed. Altogether, this is a nice revision. If you liked the first edition, this one will please you too!

University of Wisconsin
Madison, U.S.A. N.R. Draper

GROWTH CURVES. A.M. Kshirsagar and W.B. Smith. New York: Dekker, 1995, pp. xv + 359, US$135.00.

Contents:
1. Introduction
2. The growth curve model
3. A multidimensional growth curve model
4. The sum of profiles and time moving covariates model
5. A growth curve model with exchangeably distributed errors
6. Structured covariance matrices, model selection, prediction from growth curves and other topics
7. Growth curves with incomplete or unbalanced data
8. Potthoff-Roy growth curve model: Derivations of main results
9. Bayesian analysis of the Potthoff-Roy model
10. Nonparametric methods in growth curve analysis

Readership: Academic and industrial statisticians and experimental scientists

Growth curves are used to model data in which there are observations on the same experimental units taken over time, so that the observations are corre-lated. A model's coefficients and the variance-covari-ance structure are estimated from the data. This book provides an attractive, sophisticated treatment of the area. Knowledge of a matrix algebra, including the Kronecker product, is needed for an easy comprehension. The presentation is clear and terse. The three case studies come with sets of data and SAS programs, in-cluding three-dimensional graphic programs. This is an attractive course text.

University of Wisconsin
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INTEGRATION AND PROBABILITY. P. Malliavin. In co-operation with H. Airault, L. Kay and G. Letac. New York: Springer-Verlag, 1995, pp. xxi + 322, DM.74.00/ÖS.540.20/Sw.fr.71.50.

Contents:
1. Measurable spaces and integrable functions
2. Borel measures and Radon measures
3. Fourier analysis
4. Hilbert space methods and limit theorems in probability thoery
5. Gaussian Sobolev spaces and stochastic calculus of variations
6. Appendix I : Hilbert Spectral Analysis
7. Appendix II: Infinitesimal and Integrated Forms of the Change-of-Variables Formula
8. Exercises for Chapter 1
9. Exercises for Chapter 2
10. Exercises for Chapter 3
11. Exercises for Chapter 4
12. Exercises for Chapter 5

Readership: Graduate students of mathematics and professional mathematicians
If I were asked to recommend texts to research students who need a grounding in integration theory this book would be on the list. Professor Malliavin gives a systematic development of the integration theory which ties together the abstract theory, 'the Halmos way', with the Riesz representation approach. He then moves on to applications and it is here that the richness of this subject area is displayed. The book is excellent!

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

QUEUEING NETWORKS WITH BLOCKING: EXACT AND APPROXIMATE SOLUTIONS. H.G. Perros. New York: Oxford University Press, 1994, pp. xiii + 288, £45.00.

Contents:
1. Basic concepts
2. Numerical methods for queueing networks with blocking
3. Two-node open queueing networks with blocking
4. Approximate analysis of open tandem queueing networks with blocking
5. Approximate analysis of arbitrarily linked open queueing networks with blocking
6. Closed queueing networks with blocking with product-form solution
7. Closed queueing networks with blocking with non product-form solution
8. Applications

Readership: Graduate students, researchers, practitioners involved in performance evaluation of computers, communication networks and production systems

This book collects together and surveys exact and approximate methods for queueing networks with blocking, at a level suitable for graduate students, one queueing theory course being the stated prerequi-site. The first two chapters include practical intro-ductions to techniques that are applicable in many areas of stochastic modelling, such as the approxi-mation of distributions by phase-type distributions, and numerical methods for continuous-time Markov chains. The remaining chapters analyze particular queueing networks with blocking, giving exact solutions where possible, and illustrating how to apply a wide variety of approximation techniques in other cases. Special attention has been given to providing a de-tailed historical overview of the relevant literature, together with a bibliography, at the end of each chap-ter. This is in addition to the extensive bibliography at the end of the book. There are no exercises.

University College London
London, U.K. S.M. Pitts

LIMIT THEOREMS OF PROBABILITY THEORY: SEQUENCES OF INDEPENDENT RANDOM VARIABLES. V.V. Petrov. Oxford University Press, 1995, pp. ix + 292, £50.00.

Contents:
1. Some basic concepts and theorems of probability theory
2. Probability inequalities for sums of independent

random variables
3. Weak limit theorems: Convergence to infinitely divisible distributions
4. Weak limit theorems: The central limit theorem and the weak law of large numbers
5. Rates of convergence in the central limit theorem
6. Strong limit theorems: The strong law of large numbers
7. Strong limit theorems: The law of the iterated logarithm

Readership: Graduate students and researchers in probability and statistics

Limit theory for sums of independent random variables plays a central role in probability and statistics, and this text provides a carefully prepared and up-to-date coverage of the basic material. It is a book in the spirit of the classic one written by Gnedenko and Kolmogorov some forty-five years ago. It is a scholarly work based on four hundred and eighty-seven references. The author index is fine but the two-page subject index should have been expanded; for example, a finer indexing of 'central limit theorem' and 'infinitely divisible distributions' would be natural in a book of this title. A casual reading re-vealed no typographical errors. The outline of the material is good. Its presentation is succinct. Each of the seven chapters ends with a subsection entitled, Addenda, in which two hundred and forty-four additional and relevant results are stated with references. A few of these could possibly be used as problems for ad-vanced classes provided hints were included. Their main purpose is to make the book's coverage of recent developments more complete. In summary, this text should be a useful reference for many years to come.

University of Washington
Seattle, U.S.A. R. Pyke

CYCLE REPRESENTATIONS OF MARKOV PROCESSES.
S.L. Kalpazidou. New York: Springer-Verlag, 1995,
pp. xv + 194, DM.88.00/ÖS.686.40/Sw.fr.84.50.

Contents:
PART I : Fundamentals of the Cycle Representations of Markov Processes
1. Directed circuits
2. Genesis of Markov chains by circuits: The circuit chains
3. Cycle representations of recurrent denumerable Markov chains
4. Circuit representations of finite recurrent Markov chains
5. Continuous parameter circuit processes with finite state space
6. Spectral theory of circuit processes
7. Higher-order circuit processes

PART II : Applications of the Cycle Representations
1. Stochastic properties in terms of circuits
2. Lévy's theorem concerning positiveness of transition probabilities
3. The rotational theory of Markov processes

Readership: Research mathematicians in probability theory, algebraic topology (network theory), algebra, convex analysis, theory of algorithms and stochastic processes

The purpose of this book is to give a sys-tematic and unified exposition of Markovian stochastic processes, which, under an additional assumption con-cerning the existence of invariant measures, can be defined by directed cycles or circuits. These processes are called cycle (or circuit) processes, and the cor-responding collections of weighted cycles are called cycle representations. A circuit or a cycle is a geo-metric concept that can be defined either by geometric or by algebraic considerations. This book is an excel-lent state-of-the-art survey of the principal trends to cycle processes theory. The first part deals with the basic concepts and equations of cycle represen-tations. The second part is concerned with the appli-cation of the theory to the study of the stochastic properties of Markov processes.

Carleton University
Ottawa, Canada M. Csörgö

RANDOM WALKS OF INFINITELY MANY PARTICLES. P. Révész.
Singapore: World Scientific, 1994, pp. xv + 191.

Contents:
Introduction
PART I : Random Walk of a Random Field
1. Brownian motion of a Poisson field
2. Extreme value problems
3. Changing the initial process and the motion

PART II : Branching Random Walk
4. Branching random walk starting with one particle
5. Branching random walks of a random field
6. Branching Wiener process starting with one particle
7. Critical branching random walk starting with one particle
8. Critical branching random walks of a random field
9. Multitype branching random walk

PART III: Strassen Type Theorems
10. Infinitely many dependent particles
11. Branching random walk

Historical Overview

Readership: Probabilists, statistical physicists

This book is a sequel to the author's Random Walk in Random and Non-Random Environments (1990) [Short Book Reviews, Vol.11, p.48], which considered the motion of a single particle. Here the focus is on the motion of countably infinitely many particles in d-dimensional Euclidean space. Asymptotic properties as time tends to infinity are studied. In Part I the particles have independent and identically distributed motions. Part II is concerned with branching random walks where the particles initially move independently but die after a random time and are replaced by off-spring according to a Galton-Watson process. These continue to move independently according to the same law as their ancestors. Part III is concerned with functional laws of the iterated logarithm for the path properties of many independent Wiener processes.

Columbia University,
New York, U.S.A. and
Australian National University
Canberra, Australia C.C. Heyde

RANDOM WALKS AND RANDOM ENVIRONMENTS. Volume 1: RANDOM WALKS. B.D. Hughes. Oxford: Clarendon Press, 1995,
pp. xxi + 631.

Contents:
1. Introduction
2. Random walks and random flights
3. Random walk on a lattice
4. Random walks in the continuum limit
5. Continuous-time random walks
6. Exploration and trapping
7. The self-avoiding walk

Readership: Probabilists, statistical physicists

In the last ten years a number of books ap-peared on random walks showing the increasing interest in the subject. In fact statistical physics produces new questions day-by-day. The present book differs from the others in the following facts: (i) each new problem is started by an interesting, detailed histori-cal overview, (ii) concentration on problems suggested by physics, (iii) more emphasis on fractals (showing the fractal properties of random walks and studying the random walks on fractals), (iv) studies of many special classes of random walks, (v) less emphasis on strong laws and limit theorems; in many problems the author is satisfied by giving the expectation and variance.

Technische Universität
Wien, Austria P. Révész

STOCHASTIC ORDERING AND DEPENDENCE IN APPLIED PROBABILITY. R. Szekli. New York: Springer-Verlag, 1995, pp. viii + 194, DM.64.00/ÖS.499.20/Sw.fr.61.50.
Contents:

1. Univariate ordering
2. Multivariate ordering
3. Dependence

Readership: Probabilists, statisticians

Readers with some background in mathematics will be able to read this pleasant monograph on stoch-astic ordering and dependence. Those familiar with stochastic processes will enjoy riding on an 'ordering' horse while watching their pet topics along the side-walks: coupling, conditioning, Markov processes, point processes, queues, networks, etc.
The bibliography covers some one hundred and eighty papers. Examples, problems and useful remarks are generously spread over the text.

Katholieke Universiteit Leuven
Heverlee, Belgium J.L. Teugels

TOPICS ON REGENERATIVE PROCESSES. V. Kalashnikov. Boca Raton, Florida: CRC Press, 1994, pp. xiii + 212.
Contents:

1. Regenerative processes
2. Crossing and coupling
3. Ergodicity and comparison
4. First occurrence times
5. Applications

Readership: Students and researchers in applied probability

The notion of regeneration appears in many fields of applied probability such as Markov chains, queues, storage models, reliability models, ... For example, the successive passage times to a definite state in a finite Markov chain form a sequence of re-generation times. At each of these random times, the process starts again and the trajectory is divided into independent identical distributed cycles. The precise definition of a regenerative process, in the strict sense and the wide sense, is given in Chapter 1 after a brief overview of the needed concepts from prob-ability and stochastic process theory. Many examples are provided. The important techniques of coupling and crossing are described in Chapter 2 and used in Chapter 3 for the analysis of ergodicity and continuity. Prob-ability metrics play an important role here. Chapter 4 is devoted to the estimation of the distribution function of first occurrence times. Some practical algorithms are proposed. Applications are given in the final chapter. This is a well-written book on a very specialized topic. Many of the theorems are given with the detailed proofs which makes it useful for students and researchers in this area.

Limburgs Universitair Centrum
Diepenbeek, Belgium N. Veraverbeke

STOCHASTIC VISIBILITY IN RANDOM FIELDS. S. Zacks. New York: Springer-Verlag, 1994, pp. v + 175 + diskette, DM.68.00/ÖS.530.40/Sw.fr.65.50.
Contents:

0. Introduction
1. Probability models
2. Geometric probability, coverage and visibility in random fields
3. Visibility probabilities
4. Visibility probabilities II
5. Distributions of visibility measures
6. Distributions of visible and invisible segments
7. Problems and solutions

Readership: Military scientist, communications scientist, statistician

This monograph is concerned with the use of coverage processes in geometric probability for model-ling one or more observers viewing partially obscured targets in the plane or on the sphere. The obscuring elements are generally taken as random discs, or spheres with random radii, whose centres are randomly located in a specified region. The motivation for this work has come primarily from military applications of hunting obscured targets, and its focus reflects this, but the results are relevant for a wide diversity of other contexts. Problems, with solutions, are provided for each chapter.

Columbia University
New York, U.S.A. C.C. Heyde

RANDOM SUMS AND BRANCHING STOCHASTIC PROCESSES. I. Rahimov. New York: Springer-Verlag, 1995, pp. 195, DM.64.00/ÖS.499.20/Sw.fr.61.50.
Contents:

1. Sums of a random number of random variables
2. Branching processes with generalized immigration
3. Branching processes for time-dependent immigration
4. The asymptotic behavior of families of particles

in branching processes

Readership: Probabilists

Consider particles that live independently of one another for some random time before generating a random number of new particles; these new particles undergo analogous transformations. Moreover there is a possibility that new particles not only emerge through reproduction but also through immigration depending on the reproduction. The monograph studies the number of such particles in the process by developing methods for the behavior of random sums of random variables. The somewhat technical monograph provides an important addition to and a welcome survey of the broad literature on branching processes.

Katholieke Universiteit Leuven
Heverlee, Belgium J.L. Teugels

CHOQUET-DENY TYPE FUNCTIONAL EQUATIONS WITH APPLICATIONS TO STOCHASTIC MODELS.
C.R. Rao and D.N. Shanbhag. Chichester, U.K.: Wiley, 1994, pp. viii + 290, £45.00.

Contents:

1. Probability tools and preliminary results
2. Simple integral equations: Versions of the integrated Cauchy functional equation
3. A version of Deny's theorem and its extensions: A Martingale approach
4. Multiple integral equations and stability theory
5. Mean residual life function and hazard measure
6. Properties based on Fourier and Mellin transformations
7. Damage models and partial independence
8. Order statistics, record values and properties in applied probability
9. Characterizations based on regression and related statistical properties

Readership: Researchers and graduate students in probability and statistics

Characterization problems is a fascinating area of mathematical statistics. Books to survey recent results have been missing, but here is a good one, es-sentially concerned with findings from the last three to four decades. The earliest of the many papers re-ferred to by the authors are from 1947 and 1970 re-spectively; this book is a result of a long love. What Rao and Shanbhag have compiled is a cornucopia of analytical probability theory.

University of Göteborg
Göteborg, Sweden T. Lindvall

IMAGE ANALYSIS, RANDOM FIELDS AND DYNAMIC MONTE CARLO METHODS. A MATHEMATICAL INTRODUCTION. G. Winkler. Berlin: Springer-Verlag, 1995, pp. xiv + 324, DM.98.00/ÖS.764.40/Sw.fr.94.50.

Contents:

PART I : Bayesian Image Analysis: Introduction
PART II : The Gibbs Sampler and Simulated Annealing
PART III: More on Sampling and Annealing
PART IV : Texture Analysis
PART V : Parameter Estimation
PART VI : Supplement

Readership: Research workers interested in rigorous mathematical treatments of the subjects covered by the monograph's title

This book presents a rigorous, self-contained treatment of the mathematical theory of random fields and Monte Carlo methods in the context of image analy-sis. This includes, for example, recent results on ap-proximating the second largest eigenvalue of a Markov chain and the work of Comets and Gidas on asymptotics of maximum likelihood and maximum pseudolikelihood estimation in Markov random fields. The book also touches on much applied material, such as texture an-alysis and tomography, but the emphasis is still on precise mathematical formulations rather than detailed consideration of applications. The book could be very successful as a course text or for background reading among those who want to study the mathematical back-ground of this whole rapidly expanding field. It will not be so popular among those whose primary interest is computation and applications. There are various quirky features, for example, the consistent mis-spelling of spatial, but these will not deter the committed reader.

University of Cambridge
Cambridge, U.K. R.L. Smith

HARMONIC ANALYSIS OF PROBABILITY MEASURES ON HYPERGROUPS. W.R. Bloom and H. Heyer. Berlin: de Gruyter, 1994, pp. vi + 601, DM.248.00.

Contents:

1. Introduction
2. Hypergroups and their measure algebras
3. The dual of a commutative hypergroup
4. Some special classes of hypergroups
5. Positive and negative definite functions and measures
6. Convolution semigroups and divisibility of measures
7. Transience of convolution semigroups
8. Randomised sums of hypergroup-valued random variables
9. Further topics

Readership: Analysts and probabilists

Although this book deals mainly with com-mutative topological hypergroups it offers a compre-hensive introduction to hypergroups. It aims to apply the "hypergroup method" to problems in probability theory. The reader unfamiliar with this area would do well to read this book with a text about harmonic analysis on groups to hand, because, from the viewpoint of this book, harmonic analysis on hypergroups amounts to harmonic analysis on certain measure algebras.
A good test of the quality of the writing of a mathematics text is to pick a few of the proofs, at random, and read them through looking for style and clarity. This book scores well.

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

FROM BROWNIAN MOTION TO SCHRÖDINGER EQUATION. K.L. Chung and Z. Zhao. Berlin: Springer-Verlag, 1995, pp. xii + 287, DM.148.00/ÖS.1,154.40, Sw.fr.142.50.

Contents:

1. Preparatory material
2. Killed Brownian motion
3. Schrödinger operator
4. Stopped Feynman-Kac functional
5. Conditional Brownian motion and conditional Gauge
6. Green functions
7. Conditional Gauge and q-Green function
8. Various related developments
9. The case of one dimension

Readership: Researchers and graduate students

This book is a self-contained monograph on potential theory of Schrödinger operators, to which the authors contributions in the last decades are well-known. Each chapter contains "Notes" by one of the authors, K.L. Chung, who provides an historical over-view of the subject treated. This book is an excellent contribution to potential theory and stochastic pro-cesses, and recommended to researchers and graduate students of mathematics and mathematical physics.

Universität Zürich,
Zürich, Switzerland M. Nagasawa

BUSINESS SURVEY METHODS. B.G. Cox, D.A. Binder, B.N. Chinnappa, A. Christianson, M.J. Colledge and P.S. Kott (Eds.). New York: Wiley, 1995, p. xvii + 732, £96.00.

From the preface: "A nation's official stati-stics are directly affected by the quality of the data derived from its surveys of businesses, farms, and in-stitutions. Yet methodology and standards for these surveys vary tremendously across countries and stati-stical agencies C unlike the situation for surveys of persons and households. Reasons for this disparity are diverse, but most relate to the difficult design and execution problems such surveys encounter for which solutions are not readily available in the research literature. The International Conference on Establish-ment Surveys (ICES) was organized to address this pro-blem. This monograph is a product of that conference."

The papers in the volume are divided into six parts: 1. Frames and business registers; 2. Sample de-sign and selection; 3. Data collection and response quality; 4. Data processing; 5. Weighting and esti-mation; 6. Past, present and future directions.

THE FOUNDATIONS OF ECONOMETRIC ANALYSIS. D.F. Hendry and M.S. Morgan (Eds.). Cambridge University Press, 1995, pp. xvi + 558, £40.00/US$59.95.

From the preface: "Despite being a relatively young discipline (the Econometric Society was founded in 1931), econometrics already has a substantial intel-lectual history concerned with making sense of empiri-cal economic evidence. Reading the early studies in quantitative economics and econometrics highlighted the wealth of material that was no longer well remembered, and revealed the insights it could cast on current debates as well as the historical perspective it automatically provided."

The book contains previously published and unpublished papers with commentaries by the editors. Papers of special interest to statisticians include: W.S. Jevons. On the study of periodic commercial fluct-uations. Investigations in currency and finance, (1884) pp. 3-10; G.U. Yule. Why do we sometimes get nonsense correlations. Journal of the Royal Statistical Society, 89, (1926) pp. 2-9, 30-40; G.U. Yule. On a method of investigating periodicities in disturbed series, with special reference to Wolfer's sunspot numbers. Philo-sophical Transactions of the Royal Society of London, A. 226, (1927) pp. 267-273; A. Wald. Calculation and elimination of seasonal fluctuations. Berechnung und Ausschaltung von Saisonschwankungen, (1936), Chapter 1; J. Tinbergen. Statistical testing of business cycle theories: A method and its application to investment activity. League of Nations, Geneva (1939) I, pp. 27-33; T.C. Koopmans. When is an equation system complete for statistical purposes. Statistical Inference in Dynamic Economic Models, Wiley, New York (1950) pp. 393-409.

MEASURING THE MIND. Education and Psychology in England, c.1860-c.1990. A. Wooldridge. Cambridge University Press, 1994, pp. ix + 448, £45.00/US$69.95.

From the introduction: "In Some Thoughts Concerning Education, John Locke made an uncharac-teristic but striking observation:

God has stampt certain Characters upon
Men's Minds, which, like their shapes,
may perhaps be a little mended; but can
hardly be totally alter'd and tranformed
into the contrary.
He therefore, that is about Children,
should well study their Natures and
Aptitudes, and see by often Tryals, what
turn they easily take, and what becomes
of them; observe what their Native Stock
is, how it may be improved, and what it
is fit for...Everyone's Natural Genius
should be carried as far as it could, but
to attempt the putting another upon him,
will be but Labour in vain.

This study deals with a group of the late nineteenth and twentieth century psychologists who spent their lives carrying out Locke's injunctions. ...

"The argument focuses on three main themes: the emergence of the profession of educational psy-chology; the history of ideas about children's mental development, in particular the development of the sub-normal and the gifted; and the role of psychological experts in formulating educational policy."

AMERICAN HIGHER EDUCATION. A History. C.J. Lucas. New York: St. Martin's Press, 1994, pp. xxi + 375.

The author answers the question: How did the modern American College or university come to be what it is today?

MAKING WAVES. Engineering, Politics, and the Social Management of Technology. E. Wenk, Jr. Urbana, Illinois: University of Illinois Press, 1995, pp. xiii + 269.

Edward Wenk Jr. was the first science advisor to the United States Congress. He was also an advisor to Presidents Kennedy, Johnson and Nixon. In this book Wenk shows how science and technology affect social, economic and political issues.

RISK, SCIENCE, AND POLITICS. Regulating Toxic Substances in Canada and the United States. K. Harrison and G. Hoberg. Montreal and Kingston: McGill-Queen's University Press, 1994, pp. xiii + 235, Can.$17.95.

The authors examine the regulation of toxic substances in Canada and the United States by analyzing particular studies of controversial substances.

ENVIRONMENTAL HEALTH RISKS AND PUBLIC POLICY. Decision Making in Free Societies. D.V. Bates. Seattle, Washington: University of Washington Press, 1994, pp. xii + 117, US$30.00 Cloth; US$12.95 Paper.

The author discusses how industrial societies have created goods and services which not only add pro-ductivity and pleasure but also have hazardous side effects. A major concern here is a pollution which has been linked to chronic illness.

From the book cover: "As society's awareness of environmental effects on public health has grown, scientists (especially epidemiologists) have been in-creasingly drawn into the public arena. The design of studies, the manipulation of statistics, and additional risk factors influence the acceptance of "hazards" as clearly causing certain diseases. ...

"The book offers conclusions about the central role of environmental epidemiology as the "detective" science in elucidating health effects of human tech-nological advances, and examines the different, often conflicting, sometimes colluding roles of government, industry, and the general public in the debate over public health hazards."

CONVERSATIONS ON MIND, MATTER, AND MATHEMATICS. J.-P. Changeux and A. Connes. Edited and translated by M.B. DeBevoise. Princeton University Press, 1995, pp. xii + 260, US$24.95/,19.95. [Originally published in 1989].

This volume consists of a conversation between the two authors, one a neurobiologist and one a mathe-matician, about the development of the

human brain as a function of natural selection and variation, and the character of human intelligence.

REINVENTING NATURE? Responses to Postmodern Deconstruction. M.E. Soule and G. Lease (Eds.). Washington, D.C.: Island Press, 1995, pp. xvii + 186.
This volume contains nine chapters by writers in many fields including philosophy, history, public policy, forestry and on the conflict between perception and reality of nature.

NOTHING IS TOO WONDERFUL TO BE TRUE. P. Morrison. Woodbury, New York: The American Institute of Physics, 1995, pp. xi + 446, £23.95.
Philip Morrison is a famous physicist. Victor Weisskopf has written about this book: "Listening to Phil Morrison's conversations and talks or reading his articles leave you not only better informed, but also more inspired. Morrison fills scientific information with enthusiasm and love of nature in all its forms. You can spend hours of pleasure and enlightenment reading it. You will love it".

HYPATIA OF ALEXANDRIA. M. Dzielska. Translated by F. Lyra. Cambridge, Massachusetts: Harvard University Press, 1995, pp. viii + 157, US$29.95.
Hypatia was a brilliant mathematician and renowned for her beauty. She was murdered by a group of Christians in 415 AD. Since then Hypatia has been a legend. The author gives the real story behind the legend of Hypatia's life and death.

THE CHILDREN OF TIME. Causality, Entropy, Becoming. R. Lestienne. Translated from the French by E.C. Neher. Urbana, Illinois: University of Illinois Press, 1995, pp. xiii + 220, US$45.95 Cloth; US$17.95 Paper.
The author is a philosopher and a physicist. This is an account of how time has been understood, defined and perceived. The French edition was published in 1990.

THE PHYSICS OF CHANCE. From Blaise Pascal to Niels Bohr. C. Ruhla. Translated from the French by G. Baiston. Oxford: Oxford University Press, 1992, pp. xi + 222, Can.$43.50. [First French edition 1989, Reprinted 1995].
In the preface the author asks the following question: "Is chance merely an expression of our ignorance, or is it an inherent characteristic of natural phenomena?"

From the back cover: "This is an introduction to the ideas of randomness that are central to much of modern physics and have overthrown the 'clock-work universe' conceptions of earlier centuries. The author shows how the laws of probability and statistics were developed by such mathematicians as Fermat, Pascal, and Gauss, and how they received their first major appli-cation in physics in the kinetic theory of gases deve-loped by Maxwell and Boltzmann."

INDUSTRY'S FUTURE. Changing Patterns of Industrial Research. H.I. Fusfeld. Washington, D.C.: American Chemical Society, 1994, pp. xiv + 369, US$39.95 Cloth; US$24.95 Paper.
This volume on industrial research discusses industrial research, the influences that shape such research and its place in society as a whole.

THE PHYSICS OF IMMORTALITY. Modern Cosmology, God and the Resurrection of the Dead. F.J. Tipler. London: Macmillan, 1995, pp. xxvi + 528, £20.00.
This volume presents a scientific argument for the existence of God.

IMPACTS OF THE EARLY COLD WAR ON THE FORMULATION OF U.S. SCIENCE POLICY. Selected Memoranda of William T. Golden, October 1950 - April 1951. Edited with an Appreciation by W.A. Blanpied. Foreword by N. Land. Washington, D.C.: American Association for the Advancement of Science, 1995, pp. xliv + 97.
W.T. Golden was a key figure in the establish-ment of a Presidential Science Adviser's office in the Truman administration. During that time, Golden inter-viewed a number of leading scientists and government officials including V. Bush, J.B. Corant, J.R. Oppenheimer and J.J. Rabi. Golden kept detailed memor-anda of that period. Some of these are reported in this volume.

FRONT PAGE PHYSICS. A Century of Physics in the News. A.J. Meadows and M.M. Hancock-Beaulieu. Bristol: Institute of Physics, 1994, pp. 221.
This book demonstrates how science was reported to the public from the 1890's to 1989 by showing the actual newspaper articles.

PAPER EDITIONS OR REPRINTS

A CONCRETE APPROACH TO MATHEMATICAL MODELLING. M. Mesterton-Gibbons. New York: Wiley, 1995, pp. xx + 597, £49.95. [Original 1989; Reviewed in Short Book Reviews, Vol. 10, p.22.]

CHAOS AND DETERMINISM. Turbulence as a Paradigm for Complex Systems Converging Toward Final States. A. Favre, H. Guitton, J. Guitton, A. Lichnerowicz, and E. Wolff. Baltimore, Maryland: Johns Hopkins University Press, 1995, pp. xxvi + 176, US$45.00 Cloth; US$19.95 Paper. [Original 1988]

MATHEMATICAL STATISTICS AND DATA ANALYSIS, 2nd edition. J.A. Rice. Belmont, California: Duxbury, 1995, pp. xx + 651 + disk. [Original 1988; Reviewed in Short Book Reviews, Vol. 8, p.37.]

PERTURBATION THEORY FOR LINEAR OPERATORS. Reprint of the 1980 Edition. T. Kato. Berlin: Springer-Verlag, 1995, pp. xxi + 619, DM.59.00/ÖS.460.20/Sw.fr.57.00.

PROBABILITY AND MEASURE, 3rd edition. P. Billingsley. New York: Wiley, 1995, pp. xii + 593, £49.95. [Original 1979, 2nd edition 1986]

PROBLEM SOLVING. A Statistician's Guide, 2nd edition. C. Chatfield. London: Chapman and Hall, 1995, pp. xi + 325, £19.99. [Original 1988. Reviewed in Short Book Reviews, Vol. 9, p.22.]

SURVEY SAMPLING. L. Kish. New York: Wiley, 1995, pp. xvi + 643, £26.95. [Original 1965]

GOVERNMENT PUBLICATIONS

BATIMENTS ACHEVES. VENTE DE BIENS IMMOBILIERS. Bulletin du STATEC, Vol. XXXXII, No. 4, 1995. Luxembourg: Service Central de la Statistique et des Etudes Economiques, 1995, pp. 42.

EMPIRICAL LIFE CYCLE MODELS OF LABOUR SUPPLY AND CONSUMPTION. T. Kornstad. Oslo-Kongsvinger: Statistics Norway, 1995, pp. 115, Kr.110.00.

LE RECENSEMENT AGRICOLE, 1994. Bulletin du STATEC, Vol. XXXXII, No. 3, 1995. Luxembourg: Service Central de la Statistique et des Etudes Economiques, 1995, pp. 22.

UNITED NATIONS STATISTICAL OFFICE PUBLICATIONS RECENTLY ISSUED

COMMODITY TRADE STATISTICS 1988 and 1989. Brunei Darussalam 1988 Rev. 2, Former Czechoslovakia 1988 Rev. 2, Malawi 1988 Rev. 2, Suriname 1988 Rev. 2, United Arab Emirates 1988 Rev. 2, Mauritius 1988 Rev. 3, Malawi 1989 Rev. 2, Mali 1989 Rev. 2, Former Czechoslovakia 1989 Rev. 3, Mauritius 1989 Rev. 3. Statistical Papers Series D. Vol. XXXVIII, No. 1-30, and Statistical Papers Series D. Vol. XXXIX, No. 1-28, ST/ESA/STAT/SER.D/103-30, and ST/ESA/STAT/SER.D/105-28, 1995, pp. 340, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Kuwait Rev. 2, Mali Rev. 2, Saudi Arabia Rev. 2, United Arab Emirates Rev. 2, Cameroon Rev.3, Former Czechoslovakia Rev.3 Statistical Papers Series D. Vol. XL, No. 1-31, ST/ESA/STAT/SER.D/107-31, 1995, pp. 367, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1992. Kenya Rev. 3, Southern Africa (Customs Union of) Rev. 3. Statistical Papers Series D. Vol. XLII, No. 1-35, ST/ESA/STAT/SER.D/111-35, 1995, pp. 254, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1992. Netherlands Antilles Rev. 1, Tonga Rev. 1, Syrian Arab Republic Rev. 3. Statistical Papers Series D. Vol. XLII, No. 1-34, ST/ESA/STAT/SER.D/111-34, 1994, pp. 305, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Australia Rev. 3, Kuwait Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-35, ST/ESA/STAT/SER.D/113-35, 1995, pp. 344, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Bangladesh Rev. 3, Denmark Rev. 3, Seychelles Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-33, ST/ESA/STAT/SER.D/113-33, 1995, pp. 289, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Barbados Rev. 3, Brazil Rev. 3, Poland Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-26, ST/ESA/STAT/SER.D/113-26, 1995, pp. 340, US$180.00 US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Belgium-Luxembourg Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-31, ST/ESA/STAT/SER.D/113-31, 1995, pp. 331, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Belize Rev. 3, Ecuador Rev. 3, Ireland Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-28, ST/ESA/STAT/SER.D/113-28, 1994, pp. 264, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. French Guiana Rev. 3, Guadeloupe Rev. 3, Norway, including Svalbard and Jan Mayen Islands Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-34, ST/ESA/STAT/ SER.D/113-34, 1995, pp. 331, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Greece Rev. 3, Mauritius Rev. 3, Sri Lanka Rev 3. Statistical Papers Series D. Vol. XLIII, No. 1-34, ST/ESA/STAT/SER.D/113-34, 1995, pp. 331, US$180.00 Annual Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. India Rev. 3, Portugal Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-32, ST/ESA/STAT/SER.D/113-32, 1995, pp. 368, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Korea, Republic of Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-27, ST/ESA/STAT/SER.D/113-27, 1994, pp. 256, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Malaysia Rev. 3, Southern Africa (Customs Union of) Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-30, ST/ESA/STAT/SER.D/113-30, 1994, pp. 392, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1993. Mexico Rev. 3, Tunisia Rev. 3. Statistical Papers Series D. Vol. XLIII, No. 1-29, ST/ESA/STAT/SER.D/113-29, 1994, pp. 277, US$180.00 Annual Subscription; US$10.00 Price per fascicle.

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