

SCIENCE, IDEOLOGY, AND THE MEDIA. The Cyril Burt

Scandal. R. Fletcher. New Brunswick, New Jersey:

Transection Publishers, 1991, pp. xxviii + 419,

US\$ 29.95.

Contents:

1. Case for the Defence

PART I : Preamble; Introduction; Approach; Jury;

Prosecution; Cross-Examination; Fraud? True or False?; Rehabilitation; Relevance?

PART II : Witnesses for the Prosecution. Cross-Examination Introduction

2. The BBC: The Intelligence Man; The billing; Misrepresentations;; Questions requiring public answers; Notes

3. Professor Leon Kamin; General Charges; The 1943 paper "Ability and Income"; The "Invariant Correlations";; Notes

4. Dr. Oliver Gillie and the Press; The Most Sensational Charge of Fraud This Century; ...; The Missing Ladies - and Parapsychology; ...; Notes

5. The Clarkes and Hull; Collaboration in the Public Charge of Fraud; The Famous Articles: ...: Notes

6. Professor Leslie Hearnshaw: The Official Biography; ... Dorfman and Stigler on Burt's Statistics; ...; Strange Conjectures; ...; Notes

7. Professors Jensen and Eysenck; Questions Requiring Public Answers; Notes

8. The Sociologists of Education; ...; Heredity and Environment: Burt; Heredity and Environment: The Sociologists of Education; Conclusion; Notes

9. Final summary note

PART III: Malfeasance and Fraud? Summing Up, Additional Evidence, and Verdict

10. Malfeasance?; Eugenics; Racism; Social Class; ...; Note

11. Fraud? The Minor Charges; ...; Falsifying the History of Factor Analysis

12. Fraud? The Major Charges; ...; The Vulnerability of Exactitude; Age; Notes

13. Verdict

PART IV : Questions and Conclusions

14. Remaining considerations: ...; Notes

Readership: General

This volume gives a detailed rebuttal of the charges made in 1976 and later to the effect that the British psychologist Sir Cyril Burt faked his data and committed other scientific crimes and misdemeanours. Following the publication of this book, and that by Joynson reviewed in December 1989, a group of members of the British Psychological Society (BPS) asked that the Society should invite the Royal Society to institute a formal inquiry in order to reconsider Burt's conduct. The BPS issued a unanimously agreed statement on the 24th February 1992 summarized as follows:

1. Twelve years ago the Society assumed that Burt was guilty of fraud.

We no longer hold that view. It is not that we have looked at the evidence and come to a different conclusion. We have decided that we ought not to be taking a corporate position at all.

2. The Society has procedures for investigating professional misconduct by members. They do not, and cannot, apply to deceased members.

3. The allegations concerning Burt are a matter of historical debate. It is not the job of a learned body in a free society to adjudicate on such matters. Our role is to promote discussion so that people can make up their own minds.

4. To this end, the Council will organize a major symposium, chaired by the President, at its next London Conference, in December this year, at which the allegations directed at Burt will be reviewed.

The Council resolution condemning Burt can be found on p.71 of the Monthly Bulletin of the BPS for February 1980.

In the present book one collector of Burt's data is referred to as Miss Lettice Ramsey. She was, alas, for many years widow of Frank Ramsey, an originator of the modern theory of personal probability.

Essex University

Colchester, U.K.G.A. Barnard

MEDICAL USES OF STATISTICS, 2nd edition.

J.C. Bailar III and F. Mosteller (Eds.). Boston:

NEJM Books, 1992, pp. xxvii + 449, US\$39.95.

Contents:

PART I : Broad Concepts and Analytic Techniques

1. Statistical concepts fundamental to investigations

2. Some uses of statistical thinking

3. Use of statistical analysis in the New England Journal of Medicine

PART II : Design

4. Designs for experiments: Parallel comparisons of treatment

5. Crossover and self-controlled designs in clinical research

6. Studies without internal controls

7. The series of consecutive cases as a device for assessing outcomes of interventions

8. A classification for biomedical research reports

PART III: Analysis

9. Decision analysis

10. P values

11. Simple linear regression in medical research

12. Comparing the means of several groups

13. Analyzing data from ordered categories

14. Statistical analysis of survival data

15. Contingency tables in medical studies

PART IV : Communicating Results

16. Guidelines for statistical reporting in articles of medical journals

17. Reporting on methods in clinical trials

18. Statistical consultation in clinical research: A two-way street

19. The importance of beta, the Type II error, and the sample size in the design and interpretation of the randomized controlled trial: Survey of two

sets of "negative" trials

20. Writing about numbers

PART V : Reviews and Meta-Studies

21. Medical technology assessment

22. Combining results from independent investigations:

Meta-analysis in clinical research

23. Meta-analyses of randomized control trials: An

update of the quality and methodology

Readership: Consumers of statistics, biostatisticians

In the late 1970s, the editors of the New England Journal of Medicine encouraged a group of Harvard-based statisticians to survey the current use of statistics in their journal and to recommend future practice. The first edition of this book (1986) [Short Book Reviews, Vol. 7, p.3] contained, in the main, articles written by the group and published in the journal. The second edition updates the surveys and the recommendations: seven chapters are new, four dropped, two completely rewritten, and the rest revised. Many of the chapters are models of clear writing; the chapter on P values is a masterly treatment of an elementary but complex topic. The book gives sound, practical advice and helps the reader to understand the purposes of statistical techniques, but is not a text book and does not explain the details of the techniques. I know of no other book which describes "what every statistician knows" so clearly and succinctly.

York University

North York, Canada P.A. Herzberg

MACSYMA FOR STATISTICIANS. B. Heller. New York: Wiley, 1991, pp. xiv + 246, £32.15.

Contents:

1. Getting started

2. Variables, lists, equations, functions, and arrays

3. Iteration, conditionals, blocks, and recursion

4. Part selection, substitution, and evaluate

5. Internal representation, storage, general utilities

6. Matrices and lists

7. Advanced uses of MACSYMA

Readership: Professional statisticians, probabilists, mathematicians and students

This book provides an introduction to the basic principles and ideas of MACSYMA, a computer system for symbolic and numerical calculation. The book has numerous exercises and may be used as a text.

MACSYMA was one of the first systems for symbolic computation to receive widespread use. Since its development, other systems including Mathematica, Maple and Reduce have been introduced. Although these systems all differ in their structure and use there is much that is common. This book is a useful introduction to the field. Although much of the book is devoted to general techniques such as for handling matrices and lists, there are examples which indicate the power of symbolic calculation. The section on Edgeworth series shows how the series may be derived from first principles and used in particular cases. The section on partitions leads to the calculations of cumulants from moments and in an exercise, k-statistics. These are interesting ideas and challenging calculations.

The book is an introduction, designed to be accessible by students. It is particularly useful for those using MACSYMA. Research statisticians will wish for less linear algebra and more development peculiar to statistics. There is a need for this and for more advanced books.

University of Toronto

Toronto, Canada D.F. Andrews

FUNDAMENTALS OF EXPLORATORY ANALYSIS OF VARIANCE.

D.C. Hoaglin, F. Mosteller and J.W. Tukey (Eds.).

New York: Wiley, 1991, pp. xvii + 430, £43.95.

Contents:

1. Concepts and examples of analysis of variance

2. Purposes of analyzing data that come in a form inviting us to apply tools from the analysis of variance

3. Preliminary examination of data

4. Types of factors and their structural layouts

5. Value-splitting: taking the data apart

6. Value splitting involving more factors

7. Mean squares, F tests, and estimates of variance

8. Graphical display as an aid to analysis

9. Components of variance

10. Which denominator?

11. Assessing changes

12. Qualitative and quantitative confidence

13. Introduction to transformation

Readership: Students, teachers, and users of statistics

This third volume by the same editors, with contributions by eleven authors, is something of a surprise: unlike its predecessors in the series, it is centred round a classical, confirmatory technique. However, while covering all the traditional topics in mainly balanced analysis of variance, the authors write from a perspective that is distinctly exploratory data analysis, and to excellent advantage.

The result is a self-contained introduction to standard ANOVA, accessible to a wide range of backgrounds, and offering a fresh understanding of the subject enriched by data-motivation of the models and methods. The unavoidable message, crucial in an age of computational sophistication in the hands of everyone, is that the analysis begins and ends with the data in its problem context and the standard computations enshrined in computer packages are only some of the tools required for solution of the problem. Some new (or newly exposed) graphical techniques will be appreciated by even experienced users of ANOVA. To mention just two, side-by-side plots of effects and residuals provide a powerful visual counterpart to the ANOVA table, and interference plots are a graphical accompaniment to the studentized range approach to multiple comparisons.

Queen's University

Kingston, Canada J.T. Smith

STATISTICS IN RESEARCH AND DEVELOPMENT, 2nd edition.

R. Caulett. London: Chapman and Hall, 1991, pp. xi + 471, £37.50.

Contents:

1. What is statistics?

2. Describing the sample

3. Describing the population

4. Testing and estimation: One sample

5. Testing and estimation: Two samples

6. Testing and estimation: Qualitative data

7. Testing and estimation: Assumptions

8. Statistical process control

9. Detecting process changes

10. Investigating the process - an experiment

11. Why was the experiment not successful?

12. Some simple but effective experiments

13. Adapting the simple experiments

14. Improving a bad experiment

15. Analysis of variance

16. An introduction to Taguchi techniques

Readership: Anyone concerned with the study of complex

processes in any industry. Some facility with algebra is needed, but no calculus is required, of the reader

This second edition of the 1983 book by the same title includes new sections on statistical process control and Taguchi methods. The book is friendly to read. Its selection of topics is standard, but I enjoyed it more than the usual introductory text because of its use, in the early chapters, of a single manufacturing example to set a common context for all the methods presented.

The first nine chapters deal with finding out whether something has changed, with decisions supported by significance tests, thus, the traditional role of statistics as passive arbiter. The remaining chapters introduce designed experimentation to show the strength of statistics as aggressive investigator, the analysis of variance, and Taguchi's contributions. Although the early chapters are useful "for later", I might advise readers who are driven by R&D to read Chapters 10, 11, and 12 first, to find out why it's worthwhile to learn the rest of statistics. To quote from the book's pre-face, "You don't know what you are missing until you have read it all."

The book is written for practitioners in industry, but university students who plan a career in industry, or in consulting, will also find it useful.

University of Wisconsin
Madison, U.S.A.C.A. Fung

INTRODUCTION TO RELIABILITY ANALYSIS: PROBABILITY MODELS AND STATISTICAL METHODS. S. Zacks. New York: Springer-Verlag, 1992, pp. xii + 212, DM.78.00.

Contents:

1. System effectiveness
2. Life distributions, models and their characteristics
3. Reliability of composite systems
4. Reliability of repairable systems
5. Graphical analysis of life data
6. Estimation of life distributions and system characteristics
7. Maximum likelihood estimators and confidence intervals for specific life distributions
8. Bayesian reliability estimation and prediction
9. Reliability demonstration: Testing and acceptance procedures

Readership: Engineers and statistics students

The present monograph grew out of a workshop on statistical methods of reliability analysis for engineers. It aims at bringing the engineer, student or practitioner, up to date on modern reliability methodology from the point of view of probabilistic modelling and statistical estimation. The author explains very clearly the practical background to reliability questions as well as the theory needed in solving these questions. Most of the theoretical results are presented without proofs. This choice is justified for the intended audience, as the author puts it: "the book concentrates on the methodology of the subject and on understanding theoretical results rather than on its theoretical development." On the other hand, a vast number of examples is worked out in full detail. These, together with numerous interesting exercises form the core of this excellent text. I am convinced that many engineering students will find this a very readable introduction to reliability.

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

INFERENZA STATISTICA. A. Azzalini. Berlin: Springer-Verlag, 1992, pp. xvi + 276, L.29.000.

Contents:

1. Introduction
2. Elements of probability theory
3. Likelihood
4. Maximum likelihood estimates
5. Hypothesis testing
6. Linear models

Readership: Undergraduate students

This book reflects the contents of a course given by the author at the University of Padua to undergraduate students in the Statistical Sciences Department. Its aim is to present the main concepts of classical statistical inference in a unifying framework via the likelihood principle. The intuitive arguments underlying the methods derived from the likelihood principle are clearly stated and yet the mathematical content of the book is rigorous. Indeed Chapter 2 in itself is an extremely useful compilation of basic elements of probability theory.

The author succeeds in his aim of maintaining a lean and interesting thread through the book. The layout of the book is also excellent as keywords mark the margins of the text. Every chapter contains a set of exercises. Most of these are quite complex, possibly a hint to the standard required to pass the exam.

Imperial Cancer Research Fund
London, U.K.B.L. De Stavola

DESIGN AND INFERENCE IN FINITE POPULATION SAMPLING.

A.S. Hedayat and B.K. Sinha. New York: Wiley, 1991, pp. xiii + 377, £39.95.

Contents:

1. A unified setup for probability sampling
2. Inference in finite population sampling
3. The Horvitz-Thompson estimator
4. Simple random and allied sampling designs
5. Use of auxiliary size measures in survey sampling: Strategies based on probability proportional to size schemes of sampling
6. Uses of auxiliary size measures in survey sampling: Ratio and regression methods of estimation
7. Cluster sampling designs
8. Systematic sampling designs
9. Stratified sampling designs
10. Superpopulation approach to inference in finite population sampling
11. Randomized response: A data-gathering tool for sensitive characteristics
12. Special topics: Small area estimation, nonresponse problems, and resampling techniques

Readership: Survey samplers, graduate students

This is one of a new generation of books on survey sampling. Despite its title it is not about inference. Issues of recent concern, such as the central limit theorem, consistency, conditional inference, description and analysis, are not mentioned. The book is about the choice of sampling strategies, design and estimator pairs, for univariate surveys. Many fine points of detail are carefully considered. The failure to consider designs, other than randomized response, for estimating measurement errors was particularly disappointing. Do not throw your copy of W.G. Cochran's Sampling Techniques away just yet.

University of Southampton
Southampton, U.K.T.M.F. Smith

SAMPLE SURVEY PRINCIPLES AND METHODS. V. Barnett.

London: Arnold, 1991, pp. vi + 173, £14.95.

Contents:

1. Introduction
2. Simple random sampling
3. Carrying out a sample survey
4. Ratios: Ratio and regression estimators
5. Stratified populations and stratified simple random sampling
6. Cluster and multi-stage sampling
7. Postscript

Readership: Advanced undergraduate and beginning postgraduate students in statistics.

Practitioners in any subject requiring a good knowledge of survey methods

This is a revised and expanded version of Elements of Sampling Theory, which has been consistently popular since it was first published in 1974. There is more material on such basic methodological topics as ratio estimation and multi-stage sampling and a good discussion of non-sampling errors and the problems of carrying out a survey in practice. There is also a welcome change to a more standard notation. The new version should prove even more valuable than the original.

University of Auckland
Auckland, New Zealand
A.J. Scott

MEASUREMENT ERRORS IN SURVEYS. Edited by P. Biemer, R. Groves, L. Lyberg, N. Mathiowetz and S. Sudman. New York: Wiley, 1991, pp. xxxiii + 760, £69.00.

Contents:

Introduction

1. Measurement error across disciplines
- PART I : The Questionnaire
2. The current status of questionnaire design
 3. Response alternatives: The impact of their choice and presentation order
 4. Context effects in the general social survey
 5. Mode effects of cognitively designed recall questions: A comparison of answers to telephone and mail surveys
 6. Nonexperimental research on question wording effects: A contribution to solving the generalizability problem
 7. Measurement errors in business surveys
- PART II : Respondents and Responses
8. Recall error: Sources and bias reduction techniques
 9. Measurement effects in self vs. proxy response to survey questions: An information-processing perspective
 10. An alternative approach to obtaining personal history data
 11. The item count technique as a method of indirect questioning: A review of its development and a case study application
 12. Toward a response model in establishment surveys
- PART III: Interviewers and Other Means of Data Collection
13. Data collection methods and measurement error: An overview
 14. Reducing interviewer-related error through interviewer training, supervision, and other means
 15. The design and analysis of re-interview: An overview
 16. Expenditure diary surveys and their associated errors
 17. A review of errors of direct observation in crop yield surveys
 18. Measurement error in continuing surveys of the grocery retail trade using electronic data collection methods
- PART IV : Measurement Errors in the Interview Process

19. Conversation with a purpose - or conversation? Interaction in the standardized interview

20. Cognitive laboratory methods: A taxonomy
 21. Studying respondent-interviewer interaction: The relationship between interviewing style, interviewer behavior, and response behavior
 22. The effect of interviewer and respondent characteristics on the quality of survey data: A multilevel model
 23. Interviewer, respondent, and regional office effects on response variance: A statistical decomposition
- PART V : Modeling Measurement Errors and their Effects on Estimation and Data Analysis
24. Approaches to the modeling of measurement errors
 25. A mixed model for analyzing measurement errors for dichotomous variables
 26. Models for memory effects in count data
 27. Simple response variance: Estimation and determinants
 28. Evaluation of measurement instruments using a structural modeling approach
 29. A path analysis of cross-national data taking measurement errors into account
 30. Regression estimation in the presence of measurement error
 31. Chi-Squared tests with complex survey data subject to misclassification error
 32. The effect of measurement error on event history analysis

Readership: Survey statisticians, sociologists, psychologists

This book will be an aid to survey statisticians and to research workers who must work with survey data. It is a collection of papers providing a thorough account of the current state of research on measurement errors in surveys and reporting on the findings of new research, as well as on interdisciplinary approaches in modeling, assessing and reducing measurement errors. It examines current issues in questionnaire design, the respondent-interviewer relationship, modeling measurement errors, and their effects on estimation and data analysis.

Statistics Canada
Ottawa, Canada
C.A. Mills

SURVEY SAMPLING PRINCIPLES. E.K. Foreman. New York: Dekker, 1991, pp. xvi + 497, US\$126.50.

Contents:

1. Introduction
2. Some basic concepts
3. Simple random sampling and unbiased estimates
4. Ratio and regression estimates and estimates of ratios
5. Stratified sampling
6. Selection with probability proportional to size
7. Multistage sampling: Concept
8. Multistage sampling: Application
9. Further sampling techniques
10. Control of nonsample errors
11. Sample design
12. Sample frames, selection systems, and master samples
13. Household survey master samples
14. Survey design
15. Design of series of surveys

Readership: Survey statisticians, graduate students in statistics and social sciences

This book is a welcome addition to the survey sampling library. No, or very little, competence in statistical theory on the part of the reader is assumed; proofs are in general omitted and the emphasis is on survey applications. The numerical examples are based on a very small artificial population, "Survey-town", for which the arithmetic can be easily verified. Chapters 1 to 8 provide a fairly standard coverage for a survey sampling course; Chapter 9 deals with more specialist topics; and Chapters 10 through 15 are much more a text in general survey design and execution issues. The references and reading for each chapter helpfully give the relevant page numbers when books are cited.

Throughout the book Foreman's considerable knowledge and experience give the material a flavour of authenticity that makes the material digestible, despite some daunting, for non-statisticians, algebra in the middle chapters. This is a book in the tradition of Hansen, and of Kish, who, with others, have streets named after them in "Surveytown".

London School of Economics
and Political Science
London, U.K.C. O'Muircheartaigh

MODEL ASSISTED SURVEY SAMPLING. C.E. Sarndal,
B. Swensson and J. Wretman. New York: Springer-Verlag, 1991, pp. xv
+ 694, DM.98.00.

Contents:

PART I : Principles of Estimation for Finite
Populations and Importance Sampling
Designs

1. Survey sampling in theory and practice
2. Basic ideas in estimation from probability samples
3. Unbiased estimation for element sampling designs
4. Unbiased estimation for cluster sampling and sampling in two or more stages
5. Introduction to more complex problems

PART II : Estimation Through Linear Modelling, Using
Auxiliary Variables

6. The regression estimator
7. Regression estimators for element sampling designs
8. Regression estimators for cluster sampling and two-stage sampling

PART III: Further Questions in Design and Analysis of
Surveys

9. Two-phase sampling
10. Estimation for domains
11. Variance estimation
12. Searching for optimal sampling designs
13. Further statistical techniques for survey data

PART IV : A Broader View of Errors in Surveys

14. Nonsampling errors and extensions of probability sampling theory
15. Nonresponse
16. Measurement errors
17. Quality declarations for survey data

Readership: Survey statisticians, graduate students in
statistics and social sciences

The title of this book in itself represents a bid to reclaim the word "model" in survey sampling from those who advocate model-based inference. This relatively advanced text is based on the design-based (randomization theory) approach; it does, however, take on board the considerable influence of statistical modelling on survey sampling in recent years. One of its strengths is in the way it draws on statistical modelling in its derivation of estimators. The text shows an appreciation of practical issues, though these are not generally elaborated in non-technical terms. The overall perspective, based on unequal probability sampling, is useful in integrating the treatment. The authors manage to include a coherent treatment of measurement error and nonresponse within their overall framework. This book is a very useful addition to the survey sampling literature, one that will be most useful for those with a

strong statistical grounding.

London School of Economics
and Political Science
London, U.K.C. O'Muircheartaigh

ANALYSIS OF VARIANCE IN EXPERIMENTAL DESIGN.

H.R. Lindman. New York: Springer-Verlag, 1992,
pp. viii + 531, DM.98.00.

Contents:

1. Review of statistical concepts
2. Analysis of variance, one-way, fixed effects
3. Comparing groups
4. Other multi-comparison methods
5. Two-way analysis of variance
6. Random effects
7. Higher-way designs
8. Nested designs
9. Other incomplete designs
10. One-way designs with quantitative factors
11. Trend analyses in multi-factor designs
12. Basic matrix algebra
13. Multivariate analysis of variance
14. Analysis of covariance
15. General linear model

Readership: Researchers and graduate students in
biological or social sciences

This is a book to dip into; it is not for reading from cover to cover. It attempts to explain to the non-statistician how to analyze a number of commonly occurring experimental designs and provides the reader with a wealth of numerical examples. Attention is strongly focused on the normal theory linear model. The author examines the assumptions underlying this model, although there is little guidance on what to do if these assumptions are violated. After a two-page introduction to probability and statistics, we are presented with a section on skewness and kurtosis which would leave the less mathematically trained thinking that there might not be anything in the book for them.

The book is well laid out and easy to follow, but may lure the experimenter into thinking that problems with data can be pigeon-holed into, for example, one-way analysis of variance, two-way analysis of variance, etc. A chapter giving some preliminary advice on looking at data and the consideration of suitable models would have been an advantage.

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

A USER'S GUIDE TO PRINCIPAL COMPONENTS. J.E. Jackson.
New York: Wiley, 1991, pp. xvii + 569, £56.00.

Contents:

1. Getting started
2. PCA with more than two variables
3. Scaling of data
4. Inferential procedures
5. Putting it all together - Hearing loss I
6. Operations with group data
7. Vector Interpretation I: Simplifications and inferential techniques
8. Vector Interpretation II: Rotation
9. A Case History - Hearing loss II
10. Singular value decomposition: Multidimensional

scaling I

11. Distance models: Multidimensional scaling II
12. Linear models I: Regression, PCA of predictor variables
13. Linear models II: Analysis of variance; PCA of response variables
14. Other applications of PCA
15. Flatland: Special procedures for two dimensions
16. Odds and ends
17. What is factor analysis anyhow?
18. Other competitors

Readership: Statisticians, advanced students of statistics, experimental scientists

Principal component analysis has many different uses, as is readily seen from this book. The bibliography has fifty-four pages, containing many references which have appeared since I.T. Jolliffe's Principal Component Analysis [Short Book Reviews, Vol. 6, p.45], for example in areas such as influence, partial least squares and multiple correspondence analysis. The book is designed for users; there are very few theorems, and only one proof. Techniques are illustrated on twenty-five data sets, several resulting from the author's experience as an employee with Kodak. Clear practical advice frequently flows from this experience. Particularly attractive is the introduction of new procedures through simple worked examples. There are no exercises, or guides to computer package facilities. The book ends with "... although it may appear that the pioneers in the field have skimmed off all the cream, there are still plenty of development opportunities to make PCA an even more useful technique. The increase in articles during the past few years bears this out. Come aboard." This is typical of the book's lucid style which will result in many readers reaching the end, and this conclusion.

University of Kent
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APPLIED MULTIVARIATE DATA ANALYSIS. B.S. Everitt and G. Dunn. London: Arnold, 1991, pp. xii + 304, £29.95.

Contents:

- PART I : Approaches to Analysing Data
1. Data and statistics
 2. Mathematical and statistical background
- PART II : Exploring Multivariate Data
3. The initial examination of multivariate data
 4. Reducing the dimensionality of multivariate data: Principal components and correspondence analysis
 5. Multidimensional scaling
 6. Cluster analysis
- PART III: Regression Models
7. The generalised linear model
 8. Regression and the analysis of variance
 9. Linear models for categorical data
 10. Models for rates and survival times
 11. Analysis of repeated measures
 12. Discriminant analysis
- PART IV : Latent Variable Models
13. Factor analysis
 14. Covariance structure models

Readership: Students and research workers in the social and behavioural sciences

This book is an extensive revision of Advanced Methods of Data Exploration and Modelling, by the same authors. It is assumed that readers have "a firm grasp of basic statistics and mathematics". However, the authors deliberately avoid mathematical development; for

example standard principal component results are stated without proof. Although wide-ranging, the book is easy to read. An attractive feature is the large number of real examples, many drawn from the authors' practical experience. References are up-to-date, and new developments are critically discussed. A minor caveat is that here, as is often the case, single-link cluster analysis is presented by a more complex algorithm than is necessary. Each chapter, except for Chapter 1, has exercises, some with solutions. The Appendix on computing covers just one and one-half pages. This is a very useful book which can be thoroughly recommended.

University of Kent
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MORPHOMETRIC TOOLS FOR LANDMARK DATA. Geometry and Biology. F.L. Bookstein. Cambridge University Press, 1991, pp. xiii + 435, £50.00/US\$89.95.

Contents:

1. Introduction
2. Preliminaries
3. Landmarks
4. Distance measures
5. Shape coordinates
6. Principal axes of shape change for triangles
7. Features of shape comparison
8. Retrospect and prospect

Readership: Statisticians, biological and biomedical researchers, geometers

Morphometrics is the statistical study of biological shape and shape change. Its richest data are landmarks which are points such as the "tip of nose" that have biological names as well as geometric locations. This book is the first systematic survey of morphometric methods for landmark data. It has an excellent layout incorporating a number of extremely helpful diagrams. Professor Bookstein has himself pioneered various techniques and concepts, and has brought forward the ideas of D'Arcy Thompson into a modern formulation. The book will certainly be a landmark volume in this difficult but important field of shape analysis.

University of Leeds
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META-ANALYSIS BY THE CONFIDENCE PROFILE METHOD.

D.M. Eddy, V. Hasselblad and R. Schachter. Boston: Academic Press, 1992, pp. vii + 428 + disk, US\$59.95.

Contents:

1. Examples of problems
2. Setting up the analysis
3. Formulas of the confidence profile method
4. Solutions to the example problems
5. Implementation issues
6. Conclusions

Readership: General, medical statisticians

Among many features of the book are the following: (i) advocacy of the confidence profile method, which consists in writing down a full probability model for the system under study and thence computing either maximum likelihood estimates and the corresponding matrix of observed second derivatives or, when a prior distribution is available, computing a posterior distribution for the parameter of interest; (ii) use of influence diagrams to represent the structure of probability models; (iii) a careful discussion of the types of error, systematic and random, likely to be encountered when evidence from a number of different

sources is assembled bearing on a particular medical issue (although publication bias seems not to be mentioned);

(iv) advocacy and illustration of (i) on a considerable variety of interesting examples;

(v) the assertion that "the main limitation of classical (statistical) methods is that they address individual experiments or discrete sets of data and do not adjust for biases" (p.351) and the suggestion that "the notion of adjusting for biases and...are new to the Confidence Profile Method".

Opinions on many of these points will vary. Your reviewer was unable to see anything new in (i), found the influence diagrams confusing rather than helpful (although more experience might well lead to a change of opinion), enjoyed the qualitative discussion of the examples, was disappointed at the quantitative discussion which often seemed to rely on un-tested numerical assumptions, and, while recognizing that overviews are very important and difficult to achieve satisfactorily, was unconvinced that any new statistical principles are involved.

Nuffield College
Oxford, U.K.D.R. Cox

THE BOOTSTRAP AND EDGEWORTH EXPANSION. P. Hall.

New York: Springer-Verlag, 1992, pp. xiii + 352,
DM.98.00.

Contents:

- 1.Principles of bootstrap methodology
- 2.Principles of Edgeworth expansion
- 3.An Edgeworth view of the bootstrap
- 4.Bootstrap curve estimation
- 5.Details of mathematical rigour

Readership:All those interested in why and how the bootstrap works

This is an authoritative book-length discussion of bootstrap theory by one of its main architects; an important work that is likely to be widely read and referenced. The author states that the aim of the book is to address two quite different topics, the bootstrap on the one hand and the Edgeworth expansion on the other, in the belief that each can shed light on the other. He hits this target admirably, and though some of the material is technical, its treatment is clear, highly informative, and scholarly but unfussy. Although methods of simulation are discussed in an appendix, this is not primarily a book about applying the bootstrap, but it provides theoretical underpinning for a wide range of applications. This is a book which every university statistics library should buy, and which researchers and regular users of the bootstrap will want to own and to consult regularly.

University of Oxford
Oxford, U.K.A.C. Davison

STOCHASTIC CURVE ESTIMATION. M. Rosenblatt. Hayward,

California: Institute of Mathematical Statistics/
Alexandria, Virginia: American Statistical
Association, 1991, pp. iii + 93.

Contents:

- 1.Origins
- 2.Local asymptotics
- 3.Global measures of deviation
- 4.Cross-validation
- 5.Measures of short-range dependence
- 6.Probability density and regression estimation in the case of short-range dependence
- 7.Spectral densities and cumulants
- 8.Examples of long-range dependence

- 9.Curve estimation and long-range dependence
- 10.Open questions

Readership:Students and researchers in probability and statistics

This monograph contains the notes of a series of ten lectures given at the University of California, Davis, during June 1989. The theme of the lectures is: curve estimation, based on independent and dependent observations. The book starts with some historical comments on the early examples in this area: estimation of the spectral density of a stationary sequence. Remarkably enough these first examples were related to dependent observations, but the main stream of results afterwards were for models with independent observations. Chapters 2-4, which cover about half of the book, deal with asymptotic theory under independence for density estimation and regression function estimation, based on kernels or on splines. Also the important question of bandwidth choice is discussed briefly. In the remaining chapters, it is discussed to what extent the asymptotic results still hold under appropriate conditions of short-range and long-range dependence of the sequence of observations. The bibliography contains only about ninety items. The author did of course not take up the impossible task of covering the whole literature on the subject, but he succeeded in sketching the most typical results in this important theory. Unfortunately, the book has no subject index.

Limburgs Universitair Centrum
Diepenbeek, BelgiumN. Veraverbeke

CONTINUOUS MARTINGALES AND BROWNIAN MOTION. D. Revuz

and M. Yor. Berlin: Springer-Verlag, 1991,
pp. ix + 533.

Contents:

- 0.Preliminaries
- 1.Introduction
- 2.Martingales
- 3.Markov processes
- 4.Stochastic integration
- 5.Representation of martingales
- 6.Local times
- 7.Generators and time reversal
- 8.Girsanov's theorem and first applications
- 9.Stochastic differential equations
- 10.Additive functionals of Brownian motion
- 11.Bessel processes and Ray-Knight theorems
- 12.Limit theorems in distribution

Readership:Probabilists

Brownian motion is a special case of many classes of stochastic process. It is a continuous martingale, a Gaussian process, and a Markov process (indeed it is a diffusion and a process with independent increments). The philosophy of the authors is that its study provides the ideal setting in which to exhibit the range of techniques of modern ("continuous") probability, both in the abstract and as valuable tools for many calculations. In spite of the book's title, each of the chapters treats its subject at a general level. Brownian motion recurs as an illustrative special case, and motivation, rather than as a limit to ambition. The treatment is extremely wide ranging, thorough and rigorous. While there are few formal pre-requisites beyond a background in measure theoretic probability, the book requires considerable mathematical sophistication, and some of the material, though well motivated, is necessarily quite technical. There are lots of exercises, and the well-equipped reader should find it enjoyable, rewarding and enlightening.

Queen Mary and Westfield College
London, U.K.P.J. Donnelly

UNCERTAINTY AND VAGUENESS IN KNOWLEDGE BASED SYSTEMS.

NUMERICAL METHODS. R. Kruse, E. Schwecke and J. Heinsohn. Berlin: Springer-Verlag, 1991, pp. xi + 491, DM.98.00.

Contents:

- 1.General considerations of uncertainty and vagueness
- 2.Introduction
- 3.Vague data
- 4.Probability theory
- 5.Random sets
- 6.Mass distributions
- 7.On graphical representations
- 8.Modeling aspects
- 9.Heuristic models
- 10.Fuzzy set based models
- 11.Reasoning with L-sets
- 12.Probability based models
- 13.Models based on the Dempster-Shafer theory of evidence
- 14.Reasoning with mass distributions
- 15.Related research

Readership:Graduate students in artificial intelligence, operations research, and applied probability. Researchers and practitioners in knowledge based systems

The aim of the book is to describe methods for handling ignorance within knowledge based systems. It distinguishes between uncertainty and vagueness, the former referring to a person's confidence in an item of data, and the latter to ignorance about the precision of data. It discusses formal representations of vagueness and uncertainty and compares these with existing approaches, focusing on three: probabilistic reasoning, fuzzy reasoning, and evidential reasoning.

The first six chapters outline the mathematical theories, emphasizing formal properties so as to provide a basis for what follows. The remaining chapters apply the mathematics to modelling uncertainty and vagueness.

The book is restricted to numerical methods based on measure-theoretic concepts; it does not discuss logical approaches except in the final chapter, which outlines nonstandard logics, the integration of uncertainty calculus and logic, and symbolic methods.

It has an extensive reference list.

The length and technical level of the book means that it is not to be undertaken lightly, but it does provide a good grounding in the subject. The early mathematical chapters mean that it is essentially self-contained.

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

EVOLUTION OF RANDOM SEARCH TREES. H.M. Mahmoud. New York: Wiley, 1992, pp. x + 324.

Contents:

- 1.Basic tools
- 2.Naturally growing binary search trees
- 3.Search trees with higher branching factors
- 4.Trees for multidimensional data
- 5.Tries
- 6.Digital search trees

Readership:Professionals and students in computer science and other areas where random tree-like models are sought

The aim of this book is to bring together work on the probabilistic analysis of search trees. The first chapter is simply a collection of the mathematical topics needed later in the book, without any real attempt at unification. The second chapter begins by showing how a binary tree can be constructed from an arbitrary sequence of input symbols, the randomness in the order of this sequence determining the random structure of the tree. This chapter includes discussions of path lengths and extreme paths. Chapters 3 and 4 provide generalizations of binary trees: first to trees with more than two branches at each node and secondly to the particular case of this arising when each node corresponds to a multivariate key and so may be split in multiple ways, yielding a 'quadtree'. Chapter 5 is concerned with 'tries'. A trie stores sets of keys consisting of sequences of symbols and a search for a key is similar to locating a word in a dictionary. Finally, Chapter 6 describes a mixture of search trees and tries.

The book would have benefited from more detailed discussion of the links and relationships between methods, and the contexts in which the different approaches are valuable. It does, however, provide a sound review of work in the area.

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

ALGEBRAIC METHODS FOR SIGNAL PROCESSING AND COMMUNICATIONS CODING. R.E. Blahut. New York: Springer-Verlag, 1992, pp. x + 143, DM.98.00.

Contents:

- 1.Introduction
- 2.Mathematical fundamentals
- 3.Sequences and spectra
- 4.Cyclic codes and related codes
- 5.Fast algorithms for convolution
- 6.Solving Toeplitz systems
- 7.Fast algorithms for the Fourier transform
- 8.Decoding of cyclic codes

Readership:Communications and signal processing engineers

According to the author the "primary purpose of this monograph is to explore the ties between digital signal processing and error-control codes, with the thought of eventually making them the two components of a unified theory, or of making a large part of the theory of error-control codes a subset of digital signal processing. By studying the properties of the Fourier transform in an arbitrary field, a perspective emerges in which the two subjects are unified." The discrete Fourier transform, over finite and infinite fields, and its applications to coding, to convolution, and to related topics are the central theme in this monograph.

Queen's University
Kingston, CanadaL.L. Campbell

COMMUNICATION THEORY. C.M. Goldie and R.G.E. Pinch. Cambridge University Press, 1991, pp. xiv + 210, £30.00/US\$59.95 Cloth; £10.95/US\$19.95 Paper.

Contents:

- 0.Introduction
- 1.Economical representations: Noiseless coding
- 2.Properties of a message source
- 3.Reliable transmission
- 4.Channel coding theorems
- 5.Error-control codes
- 6.Cyclic codes
- 7.Appendix: Rings, fields and vector spaces

Readership: Senior undergraduates and beginning graduate students in mathematics

This is an introductory text in information theory and algebraic coding theory. It deals with noiseless source coding and with coding for the discrete memoryless channel, and for the time-discrete memoryless channel with additive Gaussian noise, in some detail. More attention is given to Markov sources and ergodic sources than might be expected in a book of this length. Topics such as rate-distortion theory, metric entropy, universal coding, and the relation between relative entropy and statistical inference are discussed briefly. Other advanced topics, such as multiple-access channels, are mentioned with appropriate references to the literature. The algebraic coding theory chapters occupy thirty-seven pages. The main topics covered are linear codes, Reed-Muller codes, cyclic codes and BCH codes, and the Hamming and Varsharmov-Gilbert bounds.

Queen's University
Kingston, Canada L.L. Campbell

SPECTRA OF RANDOM AND ALMOST-PERIODIC OPERATORS.

L. Pastur and A. Figotin. Berlin: Springer-Verlag, 1992, pp. VII + 587, DM.178.00.

Contents:

- PART 1: Introduction
- PART 2: Asymptotic properties of metrically matrix and differential operators
- PART 3: Integrated density of state in one-dimensional problems of second order
- PART 4: Asymptotic behavior of the integrated density of states at spectral boundaries in multidimensional problems
- PART 5: Lyapunov exponents and the spectrum in one dimension
- PART 6: Random operators
- PART 7: Almost-periodic operators

Readership: Probabilists and mathematical physicists

There has been over recent years a huge amount of mathematical work devoted to the study of random and almost periodic Schrödinger operators. The present book gives an account of the current knowledge on the subject with a special emphasis in the case of dimension one. The authors have made a special effort to discuss the ideas involved in the proofs and this makes the book pleasant to read. This book will be an aid to people interested by or working in the field.

ETH-Zürich
Zürich, Switzerland A.S. Sznitman

INTEGER PROGRAMMING. S. Walukiewicz. Dordrecht: Kluwer/Warsaw, P.W.N.- Polish Scientific, 1991, pp. xvi + 182, Dfl.140.00/US\$69.00/£49.00.

Contents:

- 1. Introduction
- 2. Linear programming
- 3. Unimodularity and network flows. Cutting-plane methods
- 4. Branch-and-bound methods
- 5. The knapsack method
- 6. Equivalent formulations for integer programs
- 7. Relaxations of integer problems. Duality
- 8. Some particular integer programming problems
- 9. Near-optimal methods
- 10. Conclusions

Readership: Mathematical programmer, mathematician

This text is principally concerned with mathematical description of methods to solve integer programming problems. The descriptions are clear and well structured. The author is to be congratulated on writing a useful workmanlike book; however, for intense study of the subject and as a research text, no book can approach Integer and Combinatorial Optimization by G. Nemhauser and L. Wolsey, [Short Book Reviews, Vol.9, p. 31].

London School of Economics
London, U.K.S. Powell

OPTIMAL CONTROL THEORY AND STATIC OPTIMIZATION IN ECONOMICS. D. Leonard and N. Van Long. Cambridge

University Press, 1992, pp. x + 353, £45.00/US\$65.00
Cloth; £19.95/US\$29.95 Paper.

Contents:

- 1. Static optimization
- 2. Ordinary differential equations
- 3. Introduction to dynamic optimization
- 4. The maximum principle
- 5. The calculus of variations and dynamic programming
- 6. The general constrained control problem
- 7. Endpoint constraints and transversality conditions
- 8. Discontinuities in the optimal controls
- 9. Infinite horizon problems
- 10. Three special topics

Readership: Mathematical economists, control theorists having an interest in economic applications

This book gives a self-contained introduction to optimal control theory. It is principally aimed at economists but the book would also be of interest to control theorists who wish to see the particular terminology used to describe optimization problems in economics. The book is easy to read yet covers the key facts in the theory of static optimization (Lagrange multipliers, Kuhn-Tucker theorem, nonlinear programming, etc.) and dynamic optimization (maximum principle, state constraints, end point constraints, Hamilton-Jacobi-Bellman equation etc. The book is recommended to economists who wish to learn (or possibly teach) optimization methods. It is also recommended to control theorists who want to learn some of the language of economists (Shadow prices versus Lagrange multipliers, etc.) In summary, an interesting, readable and clear treatment of optimal control.

University of Newcastle
Newcastle, Australia G.C. Goodwin

SLIDING MODELS IN CONTROL OPTIMIZATION. V.I. Utkin.

Berlin: Springer-Verlag, 1992, pp. xiv + 286,
DM.158.00.

Contents:

- 1. Scope of the theory of sliding modes
- 2. Mathematical description of motions on discontinuity boundaries
- 3. The uniqueness problem
- 4. Stability of sliding modes
- 5. Singularly perturbed discontinuous systems
- 6. Decoupling in systems with discontinuous controls
- 7. Eigenvalue allocation
- 8. Systems with scalar control
- 9. Dynamic optimization
- 10. Control of linear plants in the presence of disturbances
- 11. Systems with high gains and discontinuous controls

12. Control of distributed parameter plants
13. Control under uncertain conditions
14. State observation and filtering
15. Sliding modes in problems of mathematical programming
16. Manipulator control systems
17. Sliding modes in control of electric motors
18. Examples

Readership: Control engineers, control theorists, mathematicians

Sliding mode control is concerned with the study of differential equations having discontinuous right-hand sides. Often in such systems, the system trajectory is forced onto a surface. The study of the system can then be greatly simplified by introducing an equivalent

A DICTIONARY OF SCIENTIFIC QUOTATIONS. A.L. Mackay.

With a Foreword by P. Medawar. Bristol: Hilger, 1991, pp. xii + 297, £9.50.

This is a second enlarged edition of the original entitled Harvest of a Quiet Eye published in 1977. One of the new additions of interest to statisticians is:

"Recapture the universalist spirit of the early natural philosophers.

Learn science and not sciences.

Know in capsule form the dozen central concepts of each of the major sciences.

Learn the habits of mind of the chemist, psychologist and geologist.

Use in each science some of the intellectual equipment of the other sciences.

Be exceptional in breadth of appreciation.

Be able in biological and medical science to suggest physical explanations or mathematical models for known or conjectured facts.

Be familiar with forging and milling, the functions of a turret lathe, the kinds of heat treating used and their effects, what an industrial still looks like

..."

[The education of a scientific generalist. Science (1949) 109, 553-8 by H.W. Bode, F. Mosteller, J.W. Tukey and C. Winsor.]

THE COLLECTED WORKS OF JOHN W. TUKEY. Volume VII.

Factorial and ANOVA (1949-1962). D.R. Cox (Ed.).

Pacific Grove, California: Wadsworth and Brooks/Cole, 1992, pp. lxx + 266, US\$54.95.

This is the seventh volume in a series which will contain the published and previously unpublished papers of John W. Tukey. The original papers have been re-typeset and indexed. As in previous volumes, this volume includes a biography of F. Mosteller, a bibliography and a foreword by J.W. Tukey. Comments on individual papers in this volume are given by D.R. Cox.

COMMUNICATING SCIENCE. A Handbook. M. Shortland and

J. Gregory. With a Foreword by W. Bodmer. Harlow,

U.K.: Longman, 1991, pp. xii + 186, £9.99.

This is a handbook for scientists, engineers and doctors who wish to communicate with the general public. In the foreword, Sir Walter Bodmer says "A non-scientific audience should be able to appreciate the elegance and excitement of science in just the same way that the artistry in a painting or the composition of a piece of music can be enjoyed. Science should be as much a part of our culture to enjoy as are the arts and humanities. Many surveys tell us that there is a public

control action, which causes the trajectory to follow the surface on a sliding mode. This mode of control has found widespread application, especially in systems where the control action is naturally discontinuous, for example, control of electrical machines using power electronic switching devices. The book gives the background theory to sliding-mode control, outlines the effect of model imperfections, presents design methodologies and describes numerous practical examples. Professor Utkin is recognized as the world authority on this topic and hence this English language version of his earlier Russian edition will be warmly welcomed by the control community.

University of Newcastle

Newcastle, Australia G.C. Goodwin

NOTES

desire for more information about science and technology. Scientists must work with their colleagues in the media and elsewhere to improve and increase the information that is available, so that this need can be properly satisfied."

"Improving the public understanding of science needs the support of the wider community of scientists talking to and writing for a wide range of audiences. Locally your newspaper or radio station will often be glad to hear from you. You could give talks at schools to help them cope better with their science teaching in the context of the new national curriculum and, at the same time, help your own organisation with its recruitment. Local women's and other groups will welcome the chance to learn something of your particular area of science. Looking further afield, there are opportunities in the major newspapers and journals, national television and radio, public lectures and books representing science to a wide audience. This book is packed with useful ideas about making the most of all these opportunities.

Science and technology will be the basis for all future improvements in our health and prosperity. But to achieve these benefits to their maximum we must have a public that is ready to accept and exploit the fruits of science and that will depend to a large extent on you the scientist helping to improve the public understanding of science."

SCIENTISTS IN THE THIRD WORLD. J. Gaillard. Lexington:

University Press of Kentucky, 1991, pp. xvi + 190, US\$32.00.

Scientific research and development play major roles in the industrialized nations. The author has looked into the question of what roles are played in developing countries. He has based his answers on a survey of 489 scientists in 67 countries.

MILLIKAN'S SCHOOL. A History of the California

Institute of Technology. J.R. Goodstein. New York:

Norton, 1991, pp. 317, £17.95.

The California Institute of Technology celebrated its centennial in 1991. It was a successful century. This is the story of the men who, with vision, energy and scientific credentials, led the Institute, commonly referred to as Caltech.

FIVE BILLION VODKA BOTTLES TO THE MOON. Tales of a

Soviet Scientist. I. Shklovsky. Translated and

adapted by M.F. Zirin and H. Zirin. New York: Norton,

1991, pp. 268, £14.95.

Iosif Shklovsky (1916-1985) was a Soviet astronomer. He was blunt and irreverent and did not suffer fools gladly. This, his autobiography, tells of the pleasures, power and pain of Soviet science.

HANS ALBERT EINSTEIN. Reminiscences of His Life and Our Life Together. E.R. Einstein. Foreword by R.W. Clark. Iowa City: Iowa Institute of Hydraulic Research, 1991, pp. xiii + 112.

Hans Albert Einstein was the elder son of Albert Einstein. Hans Albert became a leading developer of modern hydraulic engineering and a professor at the University of California at Berkeley. This is Hans Albert's biography by his widow. It shows the interplay of science, history and family life.

GALILEO'S REVENGE. Junk Science in the Courtroom. P.W. Huber. New York: Basic Books, 1991, pp. viii + 274, US\$23.00/£31.00.

The author is an engineer and a leading expert on liability law in the United States of America. He shows how lawyers have shifted the law from the rule of fact by the use of professional "expert" witnesses in order to press unsubstantiated claims on the basis of what a lawyer might call science.

DATA COLLECTION FORMS IN CLINICAL TRIALS. B. Spilker and J. Schoenfelder. New York: Raven Press, 1991, pp. xv + 672, US\$118.50.

This book has been written as an aid to re-searchers carrying out clinical trials. Until recent years, it was general practice to specifically design data-collection forms for every clinical trial; this required much time and effort by all those involved in the trial. In the 1980s, standard forms became the norm. This book contains a large number of actual forms which may be used either as they appear or with minor adjustments to suit specific trials. The forms have been designed to be of the highest quality, with the aim of increasing speed and efficiency when completing, processing and analyzing data. Guidelines on constructing the processing forms, as well as directions on customizing them, are given. A chapter is also given over to the use of remote data entry forms.

STATISTICS IN TOXICOLOGY. D. Krewski and C. Franklin (Eds.). New York: Gordon and Breach, 1991, pp. xiii + 677, US\$90.00/£47.00.

The application of a large number of statistical methods in toxicological research are considered. These methods include acute toxicity, subchronic toxicity, pharmacokinetics and genetic toxicology.

SCIENTIFIC KNOWLEDGE IN CONTROVERSY. The Social Dynamics of the Fluoridation Debate. B. Martin. With a commentary by E. Groth III. Albany, New York: State University of New York Press, 1991, pp. vii + 266, US\$16.95.

This is a study of one of the most heated and long-lived health controversies as well as the study of the role of power in science. Evidence from several countries is given.

PLAGUE: A STORY OF SMALLPOX IN MONTREAL. M. Bliss. Toronto: Harper Collins, 1991, pp. xiii + 306, Can\$26.95.

In January 1885, the people of Montreal celebrated one of the great winter carnivals of the nineteenth century. A few weeks later, a railway porter arrived in Montreal suffering from smallpox. The mis-handling of

his case initiated a smallpox epidemic which killed more than 3000 Montrealers in less than three months. Every single death could have been pre-vented by vaccination.

The epidemic caused great disruption. Troops were called out to guard smallpox hospitals against anti-vaccination rioters. The city of Montreal was quarantined from the rest of North America.

This was the last epidemic of smallpox to devastate a city in the Western World. This book could perhaps be considered a parable about the epidemic diseases of our time.

VITAMIN C AND CANCER: MEDICINE OR POLITICS?

E. Richards. Basingstoke, U.K.: MacMillan, 1991, pp. xii + 269, £35.00.

From the introduction: "As a case study, the vitamin C cancer controversy offers some valuable in-sights into the processes by which medical therapies are evaluated and put into practice. For this reason its history is relevant to all who wish to have a better understanding of, and, if possible, some input with the assessment and choice of available medical treatments."

EARTHQUAKE HAZARD ANALYSIS. L. Reiter. New York:

Columbia University Press, 1990, pp. x + 254, US\$75.00.

This volume describes the basic structure, concepts, and application of deterministic and probabilistic seismic hazard analysis.

INTRODUCTION TO MECHANICAL RELIABILITY: A Designer's

Approach. O. Vinogradov. New York: Hemisphere, 1991, pp. x + 142, £35.00.

From the preface: "...reliability is treated as part of the design process, bridging an interface between reliability and design so that communications between various people in a team are more efficient."

PERSPECTIVES ON CONTEMPORARY STATISTICS. D.C. Hoaglin

and D.S. Moore (Eds.). Washington, D.C.: Mathematical Association of America, 1992, pp. xiii + 175, US\$20.00.

This volume consists of a collection of essays which according to the editors were "selected because we believe they should influence the teaching of statistics at the college level and elsewhere." The essays are: 1. What is statistics by D.S. Moore, 2. Data analysis by P.F. Velleman and D.C. Hoaglin, 3. Computers and modern statistics by R.A. Thisted and P.F. Velleman, 4. Samples and surveys by J.M. Tanur, 5. The statistical approach to the design of experiments by R.D. Snee and L.B. Hase, 6. What is probability? by G. Shafer, 7. The reasoning of statistical inference by L.E. Moses, 8. Diagnostics by D.C. Hoaglin and 9. Resistant and robust procedures by T.P. Hettmansperger and S.J. Sheather.

STATISTICAL TECHNIQUES FOR MANPOWER PLANNING.

2nd edition. D.J. Bartholomew, A.F. Forbes, and S.I. McLean. Chichester, U.K.: Wiley, 1991, pp. x + 350, £40.50.

The main change in the second edition is material on continuous-time methods and a new chapter on the data needs of manpower planning.

COMPUTATIONAL FRAMEWORKS FOR THE FAST FOURIER

TRANSFORM. C. Van Loan. Philadelphia: Society for Industrial and Applied Mathematics, 1992, pp. xiii + 273, US\$27.00.

It is generally accepted that "Life as we know it would be very different without the FFT". The author adds to this "Life as we know it would be considerably different if, from the 1965 Cooley-Tukey paper onwards, the FFT community had made systematic and heavy use of the matrix-vector notation". This book contains a very readable and up-to-date presentation of FFT techniques, their theory and application. Together with many explicit computational algorithms, the extensive annotated list of references add greatly to the scientific value of this reference text.

DIGITAL IMAGE PROCESSING. Concepts, Algorithms and Scientific Applications. B. Jähne. Berlin: Springer-Verlag, 1991, pp. xiii + 383, DM.98.00.

This book consists of selected topics in image processing with an emphasis on applications to the physical sciences, for example, the author's research on the physics of water surface waves. There are many high-quality colour plates as well as numerous figures and illustrations. Some topics, for example, image formation, discrete transforms, edge detection, motion, 3D images, are covered in depth, whereas others, for example, segmentation, classification, texture, are only summarized. The material on algorithms and spectral techniques is plentiful, and well supported by experiments; in contrast, the material on stochastic methods is rather sparse and elementary.

PAPER EDITIONS OR REPRINTS

A MATHEMATICIAN'S APOLOGY. G.H. Hardy. With a foreword by C.P. Snow. Cambridge University Press, 1992, pp. 153, £4.95/US\$7.95. [Original, 1940; Foreword, 1967].

BROWNIAN MOTION AND STOCHASTIC CALCULUS, 2nd edition. I. Karatzas and S.E. Shreve. New York: Springer-Verlag, 1991, pp. xxiii + 470, DM.68.00. [Reviewed Short Book Reviews, Vol. 8, p. 45].

COMBINATORICS. SET SYSTEMS, HYPERGRAPHS, FAMILIES OF VECTORS AND COMBINATORIAL PROBABILITY. B. Bollobas.

Cambridge University Press, 1990, pp. xii + 177, £9.95/US\$18.95 Paper. [Original Reviewed in Short Book Reviews, Vol. 6, p.39].

MODERN PROBABILITY THEORY AND ITS APPLICATIONS. E. Parzen. New York: Wiley, 1992, pp. xv + 464. [Original 1960].

STATISTICS AND SOCIETY. Data Collection and Interpretation, 2nd edition, Revised and Expanded. W.T. Federer. New York: Dekker, 1991, pp. xvi + 578, US\$35.00. [Original 1972].

GOVERNMENT PUBLICATIONS

ECONOMIC SURVEY 1991. NORWAY. Oslo: Central Bureau of Statistics of Norway, 1992, pp. 56, NOK.120.00
Subscription price; NOK.40.00 single copy.

LES COMPTES NATIONAUX DE 1970 A 1990. Bulletin du STATEC, No. 6/7/1991, Vol. XXXVIII. Luxembourg: Service Central de la Statistique et des Etudes Economiques, 1991, pp. 85.

LES COMPTES DES SERVICES EN 1990. Paris: Institut National de la Statistique et des Etudes Economiques, 1991, pp. 387, F.fr.200.00.

LES RYTHMES QUOTIDIENS EN FRANCE. Résultats de l'enquête "Emplois du temps" 1985-1986. G. Grimler. Paris: Institut National de la Statistique et des Etudes Economiques, 1992, pp. 304, F.fr.137.00.

LES VACANCES DES FRANCAIS. Evolution sur 20 ans et résultats détaillés de 1986 à 1989. M. Christine,

V. Filipowski and S. Monteiro. Paris: Institut National de la Statistique et des Etudes Economiques, 1992, pp. 286, F.fr.137.00.

METHODES DE PREVISION A COURT TERME. G. Mélard. Brussels: Editions de l'Université de Bruxelles/Paris: Editions Ellipses, 1990, pp. 468, F.fr.230.00.

PRIX DE LA CONSTRUCTION, PARC AUTOMOBILE, ACCIDENTS DE LA ROUTE. Bulletin du STATEC, Vol. XXXVII, No. 5. Luxembourg: Service Central de la Statistique et des Etudes Economiques, 1991, pp. 32.

STRUCTURE DES EMPLOIS AU 31 DECEMBRE 1989. Résultats détaillés. Paris: Institut National de la Statistique et des Etudes Economiques, 1991, pp. 123, F.fr.80.00.

UNITED NATIONS STATISTICAL OFFICE PUBLICATIONS RECENTLY ISSUED

A MODEL SURVEY OF COMPUTER SERVICES. Statistical Papers Series M. No. 81, ST/ESA/STAT/SER.M/81, 1991, pp. iv + 36.

COMMODITY TRADE STATISTICS 1986. Nicaragua Rev. 2, Panama Rev. 2, Peru Rev. 2, Saint Kitts and Nevis Rev. 2, Saint Lucia Rev. 2, Senegal Rev. 2, Togo Rev. 2, Venezuela Rev. 2. Statistical Papers Series D. Vol. XXXVI, No. 1-22, ST/ESA/STAT/

SER.D/99-22, 1991, pp. 299, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. China Rev. 2, Austria Rev. 3, Statistical Papers Series D. Vol. XL, No. 1-10, ST/ESA/STAT/SER.D/107-10, 1991, pp. 444, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Cyprus Rev. 3, Sweden Rev. 3, Statistical Papers Series D. Vol. XL, No. 1-12, 1991, pp. 342, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Denmark Rev. 3, Faeroe Islands Rev. 3, Greece Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-13, ST/ESA/STAT/SER.D/107-13, 1991, pp. 415, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. France Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-8, ST/ESA/STAT/SER.D/107-08, 1991, pp. 458, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Germany, Federal Republic of Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-7, ST/ESA/STAT/SER.D/107-07, 1991, pp. 476, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Ireland Rev. 3, Israel Rev. 3, Portugal Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-15, ST/ESA/STAT/SER.D/107-15, 1991, pp. 475, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Italy Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-6, ST/ESA/STAT/SER.D/107-06, 1991, pp. 415, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Norway Rev. 3, Switzerland Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-14, ST/ESA/STAT/SER.D/107-14, 1991, pp. 450, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. Tunisia Rev. 3, Turkey Rev. 3, Yugoslavia Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-11, ST/ESA/STAT/SER.D/107-11, 1991, pp. 427, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. United Kingdom Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-9, ST/ESA/STAT/SER.D/107-09, 1991, pp. 454, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

COMMODITY TRADE STATISTICS 1990. United States Rev. 3. Statistical Papers Series D. Vol. XL, No. 1-4, ST/ESA/STAT/SER.D/107-04, 1991, pp. 573, US\$180.00 Annual subscription; US\$10.00 Price per fascicle.

CONCEPTS AND METHODS OF ENVIRONMENT STATISTICS. Statistics of the Natural Environment. A Technical Report. Studies in Methods, Series F. No. 57, ST/ESA/STAT/SER.F/57, 1991, pp. x + 148.

ENERGY STATISTICS: A MANUAL FOR DEVELOPING COUNTRIES. Studies in Methods, Series F. No. 56, ST/ESA/STAT/SER.F/56, 1991, pp. x + 141.

HANDBOOK OF VITAL STATISTICS SYSTEMS AND METHODS. Volume I: Legal, organizational and technical aspects. Studies in Methods, Series F. No. 35, ST/ESA/STAT/SER.F/35, 1991, pp. ix + 87.

INDUSTRIAL STATISTICS YEARBOOK 1989. Volume I. General Industrial Statistics. Volume II. Commodity Production Statistics 1980-1989. ST/ESA/STAT/SER.P/29 (Vol. I), (Vol. II), 1991, U.N. Sales No. E.91.XVII.13, 14, pp. vi + 660, pp. xvi + 877.

METHODS USED IN COMPILING THE UNITED NATIONS PRICE INDEXES FOR EXTERNAL TRADE. Volume II. (Also incorporating quantum indexes). Statistical Papers Series M. No. 82, ST/ESA/STAT/SER.M/82, 1991, pp. v + 142.

POPULATION AND VITAL STATISTICS REPORT. Data available as of 1 October 1991. Statistical Papers Series A. Vol. XLIII, No. 4, ST/ESA/STAT/SER.A/179, 1991, pp. 19.

POPULATION AND VITAL STATISTICS REPORT. Data available as of 1 January 1992. Statistical Papers Series A. Vol. XLIV, No. 1, ST/ESA/STAT/SER.A/180, 1992, pp. 21.

COLLECTED PAPERS, TABLES AND PROCEEDINGS

A SPECTRUM OF STATISTICAL THOUGHT. Essays in Statistical Theory, Economics and Population Genetics in Honour of Johan Fellman. G. Rosenqvist, K. Juselius, K. Nordström and J. Palmgren (Eds.). Helsingfors: Swedish School of Economics and Business Administration, 1991, pp. v + 274.

ADVANCED METHODS IN ADAPTIVE CONTROL FOR INDUSTRIAL APPLICATIONS. K. Warwick, M. Kárný and A. Halousková (Eds.). Berlin: Springer-Verlag, 1991, pp. x + 331, DM.71.00.

ANALYSIS OF CONTROLLED DYNAMICAL SYSTEMS. Proceedings of a Conference held in Lyon, France, July 1990. B. Bonnard, B. Bride, J.P. Gauthier and I. Kupka (Eds.). Boston: Birkhäuser, 1991, pp. vii + 403, Sw.fr.158.00/DM.188.00.

ARTIFICIAL INTELLIGENCE AND COMPUTER VISION. Proceedings of the Seventh Israeli Conference, 26-27 December, 1990, Ramat Gan, Israel. Y.A. Feldman and A. Bruckstein (Eds.). Amsterdam: North-Holland, 1991, pp. x + 494, US\$137.00/ Dfl.240.00.

AUTOMATIC DIFFERENTIATION OF ALGORITHMS: Theory, Implementation, and Application. A. Griewank and G.F. Corliss (Eds.). Philadelphia: Society for Industrial and Applied Mathematics, 1991, pp. 353.

COMPUTATION AND CONTROL II. Proceedings of the Second Bozeman Conference, Bozeman, Montana, August 1-7, 1990. K.L. Bowers and J. Lund (Eds.). Boston: Birkhäuser, 1991, pp. 369, Sw.fr.118.00/DM.138.00.

COMPUTING AND GRAPHICS IN STATISTICS. A. Buja and P.A. Tukey (Eds.). New York: Springer-Verlag, 1991, pp. 279, DM.78.00.

CONTRIBUTIONS TO PROBABILITY AND STATISTICS. Essays in Honor of Ingram Olkin. L.J. Gleser, M.D. Perlman, S.J. Press and A.R. Sampson (Eds.). New York: Springer-Verlag, 1989, pp. x + 505, DM.142.00.

DIFFUSION PROCESSES AND RELATED PROBLEMS IN ANALYSIS, VOLUME II. Stochastic Flows. M.A. Pinsky and V. Wihstutz (Eds.). Boston: Birkhäuser, 1992, pp. viii + 346, Sw.fr.98.00/DM/118.00.

- DOING EXEMPLARY RESEARCH. P.J. Frost and R.E. Stablein (Eds.). Newbury Park, California: Sage, 1992, pp. xiii + 321, £14.50.
- ENDING MANDATORY RETIREMENT FOR TENURED FACULTY. The Consequences for Higher Education. P.B. Hammond and H.P. Morgan (Eds.) Washington, D.C.: National Academy Press, 1991, pp. xviii + 149.
- ESTIMATION AND CONTROL OF DISTRIBUTED PARAMETER SYSTEMS. Proceedings of an International Conference on Control and Estimation of Distributed Parameter Systems, Vorau, July 8-14, 1990. W. Desch, F. Kappel and K. Kunisch (Eds.). Basel: Birkhäuser, 1991, pp. xi + 389, Sw.fr.118.00/DM.138.00.
- FOUNDATIONS OF ADAPTIVE CONTROL. P.V. Kokotović (Ed.). Berlin: Springer-Verlag, 1991, pp. viii + 525, DM.122.00.
- FROM PIXELS TO FEATURES II. Parallelism in Image Processing. Proceedings of a Workshop held at Bonas, France, August 27- September 1, 1990. H. Burkhardt, Y. Neuvo and J.C. Simon (Eds.). Amsterdam: North-Holland, 1991, pp. viii + 413, US\$103.00/Dfl.180.00.
- GEOMETRIC ASPECTS OF INDUSTRIAL DESIGN. D.A. Field and V. Komkov (Eds.). Philadelphia: Society for Industrial and Applied Mathematics, 1992, pp. ix + 176, US\$38.50.
- GEOMETRY PROCESSING FOR DESIGN AND MANUFACTURING. R.E. Barnhill (Ed.). Philadelphia: Society for Industrial and Applied Mathematics, 1992, pp. ix + 211, US\$36.50.
- HUMAN RIGHTS AND STATISTICS: GETTING THE RECORD STRAIGHT. T.B. Jabine and R.P. Claude (Eds.). Philadelphia: University of Pennsylvania Press, 1992, pp. xvii + 458, US\$36.95.
- HUMAN RIGHTS IN CROSS-CULTURAL PERSPECTIVES: A QUEST FOR CONSENSUS. A.A. An-Naim (Ed.). Philadelphia: University of Pennsylvania Press, 1992, pp. vii + 479, US\$32.95.
- INFINITE ELECTRICAL NETWORKS. A.H. Zemanian. Cambridge University Press, 1991, pp. xi + 308, £35.00/US\$64.95.
- INTELLIGENT ROBOTIC SYSTEMS. S.G. Tzafestas (Ed.). New York: Dekker, 1991, pp. x + 720, US\$165.00.
- LIBRARY RECOMMENDATIONS FOR UNDERGRADUATE MATHEMATICS. L.A. Steen (Ed.). Washington, D.C.: The Mathematical Association of America, 1992, pp. xi + 194, US\$15.00.
- MATROID APPLICATIONS. N. White (Ed.). Cambridge University Press, 1992, pp. xii + 363, £45.00/US\$79.95.
- MODELING, ESTIMATION AND CONTROL OF SYSTEMS WITH UNCERTAINTY. Proceedings of a Conference held in Sopron, Hungary, September 1990. G.B. Di Masi, A. Gombani and A.B. Kurzhansky (Eds.). Boston: Birkhäuser, 1991, pp. vii + 467, Sw.fr.148.00/DM.178.00.
- MODERN SEQUENTIAL STATISTICAL ANALYSIS (SSA) IN HONOR OF PROFESSOR HERBERT ROBBINS. Volume I of Proceedings of the MINICON-SSA Conference (Syracuse University, Syracuse, New York, U.S.A., April 1989). American Journal of Mathematical and Management Sciences, Volume 11 (1991), Nos. 1 & 2.
- Z. Govindarajulu (Ed.). Columbus, Ohio: American Sciences Press, 1991, pp. 190, US\$98.75.
- PERSPECTIVES ON THE HISTORY OF MATHEMATICAL LOGIC. T. Drucker (Ed.). Boston: Birkhäuser, 1991, pp. xxiii + 195, Sw.fr.108.00/DM.128.00.
- PRINCIPLES OF NEURAL SCIENCE, 3rd edition. E.R. Kandel, J.H. Schwartz and T.M. Jessell (Eds.). New York: Elsevier, 1991, pp. xiv + 1135, US\$65.00/Dfl.185.00.
- PROBABILITY IN BANACH SPACES 6. Proceedings of the Sixth International Conference, Sandbjerg, Denmark 1986. U. Haagerup, J. Hoffman-Jørgensen and N.J. Nielsen (Eds.). Boston: Birkhäuser, 1990, pp. x + 288, Sw.fr.72.00/DM.84.00.
- PROBABILITY IN BANACH SPACES 7. Proceedings of the Seventh International Conference. E. Eberlein, J. Kuelbs and M.B. Marcus (Eds.). Boston: Birkhäuser, 1990, pp. viii + 307, Sw.fr.88.00/DM.98.00.
- PROCEEDINGS OF THE CENTRE FOR MATHEMATICS AND ITS APPLICATIONS, AUSTRALIAN NATIONAL UNIVERSITY. Volume 28, 1991. Workshop on Design of Longitudinal Studies and Analysis of Repeated Measures Data (1991: Canberra, A.C.T.). S.R. Wilson (Ed.). Canberra: Centre for Mathematics and its Applications, The Australian National University, 1991, pp. iv + 234, A\$25.00.
- QUEUEING, PERFORMANCE AND CONTROL IN ATM. ITC-13 Workshops. Proceedings of the Thirteenth International Teletraffic Congress, Copenhagen, Denmark, June 19-26, 1991. J.W. Cohen and C.D. Pack (Eds.). Amsterdam: North-Holland, 1991, pp. xiv + 265, US\$100.00/Dfl.175.00.
- RANDOM WALKS, BROWNIAN MOTION, AND INTERACTING PARTICLE SYSTEMS. A Festschrift in Honor of Frank Spitzer. R. Durrett and H. Kesten (Eds.). Boston: Birkhäuser, 1991, pp. ix + 455, Sw.fr.108.00/DM.128.00.
- RISK MANAGEMENT. Expanding Horizons in Nuclear Power and Other Industries. R.A. Knief (Ed.). New York: Hemisphere, 1991, pp. xiv + 269, £46.00.
- SOCIAL RESEARCH ON CHILDREN AND ADOLESCENTS. Ethical Issues. B. Stanley and J.E. Sieber (Eds.). Newbury Park, California: Sage, 1992, pp. 205, £16.95.
- SPATIAL STOCHASTIC PROCESSES. A Festschrift in Honor of Ted Harris on his Seventieth Birthday. K.S. Alexander and J.C. Watkins (Eds.). Boston: Birkhäuser, 1991, pp. xii + 256, Sw.fr.138.00/DM.166.00.
- STOCHASTIC ANALYSIS AND APPLICATIONS. Proceedings of the 1989 Lisbon Conference. A.B. Cruzeiro and J.C. Zambrini (Eds.). Boston: Birkhäuser, 1991, pp. viii + 179, Sw.fr.86.00/DM.98.00.
- STOCHASTIC PROCESSES AND THEIR APPLICATIONS. Proceedings of the Symposium held in honor of Professor S.K. Srinivasan at the Indian Institute of Technology, Bombay, India, December 27-30, 1990. M.J. Beckmann, M.N. Gopalan and R. Subramanian (Eds.). Berlin: Springer-Verlag, 1991, pp. xli + 292, DM.66.00.
- THE ART OF STATISTICAL SCIENCE. A Tribute to G.S. Watson. K.V. Mardia (Ed.). Chichester, U.K.: Wiley, 1992, pp. lii + 317, £49.95.

THE DEVELOPMENT OF STATISTICS: RECENT CONTRIBUTIONS FROM CHINA. X.R. Chen, K.T. Fang and C.C. Yang (Eds.). Harlow, Essex: Longman, 1992, pp. 298, £58.00.

THE FRONTIERS OF STATISTICAL SCIENTIFIC THEORY AND INDUSTRIAL APPLICATIONS. Volume II of the Proceedings of the ICOSCO-I Conference (The First International Conference on Statistical Computing, Çeşme, Izmir, Turkey, March-April 1987). A. Öztürk and E.C. van der Meulen (Eds.). Columbus, Ohio: American Sciences Press, 1991, pp. ix + 486, US\$98.75.

THEORETICAL ASPECTS OF INDUSTRIAL DESIGN. D.A. Field and V. Komkov (Eds.). Philadelphia: Society for Industrial and Applied Mathematics, 1992, pp. ix + 133, US\$32.50.

TOPICS IN STOCHASTIC SYSTEMS: MODELLING, ESTIMATION AND ADAPTIVE CONTROL. L. Gerencsér and P.E. Caines (Eds.). Berlin: Springer-Verlag, 1991, pp. 401, DM.100.00.

TWO-YEAR COLLEGE MATHEMATICS LIBRARY RECOMMENDATIONS. L.A. Steen (Ed.). Washington, D.C.: The Mathematical Association of America, 1992, pp. xi + 76, US\$10.00.

UNCERTAINTY IN KNOWLEDGE BASES. 3rd International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU '90, Paris, France, July 2-6, 1990. Proceedings. B. Bouchon-Meunier, R.R. Yager and L.A. Zadeh (Eds.). Berlin: Springer-Verlag, 1991, pp. x + 609, DM.87.00.

VISCOUS PROFILES AND NUMERICAL METHODS FOR SHOCK WAVES. M. Shearer (Ed.). Philadelphia: Society for Industrial and Applied Mathematics, 1991, pp. x + 252.

VORTEX DYNAMICS AND VORTEX METHODS. C.R. Anderson and C. Greengard (Eds.). Providence, Rhode Island: American Mathematical Society, 1991, pp. xi + 751, US\$149.00.

BOOKS RECEIVED

A BEGINNER'S BOOK OF T_EX. R. Seroul and S. Levy. Foreword by D. Foata. New York: Springer-Verlag, 1991, pp. xii + 282, DM.58.00.

ADVANCED MATRIX THEORY FOR SCIENTISTS AND ENGINEERS, 2nd edition. A.S. Deif. New York: Gordon and Breach, 1991, pp. xii + 302, US\$57.00/£32.00.

ANNALES STATISTIQUES DE LA FONCTION PUBLIQUE, 1945-1969-1989. D. Quarré. Paris: Institut National de la Statistique et des Etudes Economiques, 1992, pp. 323, F.fr.137.00.

ANOVA. Repeated Measures. E.R. Giriden. Newbury Park, California: Sage, 1992, pp. vi + 77, £6.50.

APPLIED ENGINEERING STATISTICS. R.M. Bethea and R.R. Rhinehart. New York: Dekker, 1991, pp. xxii + 401, US\$63.25.

APPROXIMATION OF GAUSSIAN RANDOM ELEMENTS AND STATISTICS. M. Richter. Stuttgart: Teubner, 1992, pp. 156, DM.29.00.

BALANCED SILVERMAN GAMES ON GENERAL DISCRETE SETS. G.A. Heuer and U. Leopold-Wildburger. Berlin: Springer-Verlag, 1991, pp. 139, DM.39.00.

C++ FOR SCIENTISTS AND ENGINEERS. J.T. Smith. New York: McGraw-Hill, 1991, pp. xii + 322, £23.95.

CAN'T YOU GUYS READ? Cartoons on Academia. S. Harris. New Brunswick, New Jersey: Rutgers University Press, 1991, pp. 140, US\$9.95.

CODING THEORY. The Essentials. D.G. Hoffman, D.A. Leonard, C.C. Lindner, K.T. Phelps, C.A. Rodger and J.R. Wall. New York: Dekker, 1991, pp. xi + 277, US\$55.00.

CLASSICAL COMPLEX ANALYSIS. M.O. González. New York: Dekker, 1992, pp. xiv + 767, US\$172.50.

CODE RECOGNITION AND SET SELECTION WITH NEURAL NETWORKS. C. Jeffries. Boston: Birkhäuser, 1991, pp. viii + 166, Sw.fr.78.00/DM.89.00.

COMPLEX ANALYSIS. Selected Topics. M.O. González. New York: Dekker, 1992, pp. xi + 518, US\$132.25.
COMPUTATIONAL RECREATIONS IN MATHEMATICA. I. Vardi. Redwood City, California: Addison-wesley, 1991,

pp. xvii + 286, £24.95.

CONCURRENT PROGRAMMING. C.R. Snow. Cambridge University Press, 1992, pp. x + 238, £30.00/US\$65.00 Cloth; £13.95/US\$27.95 Paper.

CONJECTURES IN ARITHMETIC ALGEBRAIC GEOMETRY. A Survey. W.W.J. Hulsbergen. Wiesbaden, Germany: Vieweg, 1992, pp. 236, DM.64.00.

DISTORTED PROBABILITIES AND CHOICE UNDER RISK. C. Puppe. Berlin: Springer-Verlag, 1991, pp. viii + 100, DM.39.00.

DRAWING GENERAL POPULATION SAMPLES IN GREAT BRITAIN. P. Lynn and D. Lieslesley. London: Social and Community Planning Research, 1991, pp. 81, £10.00.

ELEMENTARY STATISTICS: A STEP BY STEP APPROACH. A.G. Bluman. Dubuque: Brown, 1992, pp. xviii + 598.

ELEMENTS DE STATISTIQUE, 12e édition refondue. J.-J. Droesbeke. Préface de G. Le Calvé. Brussels: Editions de l'Université de Bruxelles/Paris: Editions Ellipses, 1992, pp. xxiii + 527, F.Blg.1550.00/F.fr.260.00.

EQUILIBRIUM THERMODYNAMICS. ("Single-Axiom" Approach). For Engineers and Scientists. R.W. Haywood. Malabar, Florida: Krieger, 1992, pp. 848, US\$150.00 (Set of four volumes).

ESTIMATION OF MORTALITY RATES IN STAGE-STRUCTURED POPULATIONS. S.N. Wood and R.M. Nisbet. Berlin: Springer-Verlag, 1991, pp. 101, DM.32.00.

ETHICS IN QUALITY. A.B. Mundel. New York: Dekker/Milwaukee: ASQC Quality Press, 1991, pp. vi + 220, US\$69.75.

EXACT CONSTANTS IN APPROXIMATION THEORY. N. Korneichuk. Translated by K. Ivanov. Cambridge University Press, 1991, pp. xii + 452, £55.00/US\$99.95.

FRACTALS AND CHAOS IN GEOLOGY AND GEOPHYSICS. D.L. Turcotte. Cambridge University Press, 1992, pp. x + 221, £29.95/US\$54.95.

- FROM ZERO TO INFINITY. What Makes Numbers Interesting. C. Reid. Washington, D.C.: Mathematical Association of America, 1992, pp. xiv + 186, US\$19.00.
- FUN AND GAMES. A Text on Game Theory. K. Binmore. Lexington, Massachusetts: Heath, 1992, pp. xxix + 642.
- FUNDAMENTALS OF ITEM RESPONSE THEORY. R.K. Hambleton, H. Swaminathan and H.J. Rogers. Newbury Park: Sage, 1991, pp. x + 174, £24.00 Cloth; £11.95 Paper.
- GENERAL STATISTICS, 2nd edition. W. Chase and F. Bown. New York: Wiley, 1992, pp. xiv + 720.
- GLOBAL PATTERNS. Climate, Vegetation, and Soils. W.E. Akin. Norman, Oklahoma: University of Oklahoma Press, 1991, pp. ix + 370, £35.00.
- H^∞ -OPTIMAL CONTROL AND RELATED MINIMAX DESIGN PROBLEMS. A Dynamic Game Approach. T. Başar and P. Bernhard. Boston: Birkhäuser, 1991, pp. xii + 224, Sw.fr.78.00/DM.94.00.
- IDENTIFICATION AND STOCHASTIC ADAPTIVE CONTROL. H.-F. Chen and L. Guo. Boston: Birkhäuser, 1991, pp. xi + 435, Sw.fr.128.00/DM.148.00.
- IMPROVED ESTIMATION OF DISTRIBUTION PARAMETERS: STEIN-TYPE ESTIMATORS. K. Hoffman. Stuttgart: Teubner, 1992, pp. 174, DM.29.00.
- JOURNEY INTO GEOMETRIES. M. Sved. Foreword by H.S.M. Coxeter. Washington, D.C.: The Mathematical Association of America, 1991, pp. xv + 182, US\$21.00.
- LARGE SCALE DYNAMICS OF INTERACTING PARTICLES. H. Spohn. Berlin: Springer-Verlag, 1991, pp. xi + 342, DM.120.00.
- LECTURES ON NONLINEAR EVOLUTION EQUATIONS. Initial Value Problems. R. Racke. Wiesbaden, Germany: Vieweg, 1992, pp. viii + 259, DM.68.00.
- LINEAR MODELS WITH CORRELATED DISTURBANCES. P. Knottnerus. Berlin: Springer-Verlag, 1991, pp. viii + 169, DM.53.00.
- MATHEMATICA IN ACTION. S. Wagon. New York: Freeman, 1991, pp. xiv + 419, £21.95.
- MATHEMATICAL PROBLEMS IN LINEAR VISCOELASTICITY. M. Fabrizio and A. Morro. Philadelphia: Society for Industrial and Applied Mathematics. 1992, pp. ix + 203, US\$48.50.
- MATHEMATICAL STATISTICS, 5th edition. J.E. Freund. Englewood Cliffs, New Jersey: Prentice Hall, 1992, pp. xii + 658.
- MATHEMATICS MEETS TECHNOLOGY. B. Bolt. Cambridge University Press, 1991, pp. x + 199, £12.95.
- MEASUREMENT, DESIGN, AND ANALYSIS. An Integrated Approach. E.J. Pedhazur and L.P. Schmelkin. Hillsdale, New Jersey: Erlbaum, 1991, pp. xiv + 819, £71.95.
- MULTILEVEL PROJECTION METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS. S.F. McCormick. Philadelphia: Society for Industrial and Applied Mathematics. 1992, pp. vi + 114, US\$18.50.
- PARADOXES OF BELIEF AND STRATEGIC RATIONALITY. R.C. Koons. Cambridge University Press, 1992, pp. xi + 174, £27.95/US\$49.95.
- PERTURBATION METHODS. E.J. Hinch. Cambridge University Press, 1991, pp. xi + 160, £12.95/US\$24.95.
- POLYOMINOES. A Guide to Puzzles and Problems in Tiling. G.E. Martin. Washington, D.C.: The Mathematical Association of America, 1991, pp. ix + 184, US\$21.00.
- PROBABILITY. The Mathematics of Uncertainty. D. Feldman and M. Fox. New York: Dekker, 1991, pp. xv + 404, US\$135.00.
- PROBLEMS FOR MATHEMATICIANS YOUNG AND OLD. Dolciani Mathematical Expositions. P.R. Halmos. Washington, D.C.: The Mathematical Association of America, 1991, pp. xviii + 318, US\$21.00.
- READING THE SHAPE OF NATURE. Comparative Zoology at the Agassiz Museum. M.P. Winsor. University of Chicago Press, 1991, pp. xviii + 324.
- SAMPLE SIZE CHOICE. Charts for Experiments with Linear Models, 2nd edition. R.E. Odeh and M. Fox. New York: Dekker, 1991, pp. x + 194, US\$80.00.
- SOCIAL NETWORK ANALYSIS. A Handbook. J. Scott. London: Sage, 1991, pp. x + 210, £10.95.
- STATISTICAL METHODS FOR THE PROCESS INDUSTRIES. W.H. McNeese and R.A. Klein. Milwaukee: ASQC Quality Press/New York: Dekker, 1991, pp. xvi + 512, US\$63.25.
- STATISTICAL PHYSICS II. Nonequilibrium Statistical Mechanics. R. Kubo, M. Toda and N. Hashitsume. Berlin: Springer-Verlag, 1991, pp. xvi + 279, DM.59.00.
- STATISTICS: PRINCIPLES AND METHODS, 2nd edition. R.A. Johnson and G.K. Bhattacharyya. New York: Wiley, 1992, pp. xvii + 686.
- STUDENT RESEARCH PROJECTS IN CALCULUS. M.S. Cohen, E.D. Gaughan, A. Knoebel, D.S. Kurtz and D.J. Pengelley. Washington, D.C.: The Mathematical Association of America, 1991, pp. ix + 216, US\$20.00.
- STORIES ABOUT MAXIMA AND MINIMA. Mathematical World, Vol. 1. V.M. Tikhomirov. Translated from the Russian by A. Shenitzer. Providence, Rhode Island: American Mathematical Society/Mathematical Association of America, 1990, pp. xi + 187, US\$23.00.
- SUMMATED RATING SCALE CONSTRUCTION. An Introduction. P.E. Spector. Newbury Park, California: Sage, 1992, pp. vi + 73, £6.50.
- TAKING SOCIETY'S MEASURE. H.H. Hyman. Edited and with an introduction by H.J. O'Gorman. New York: Russell Sage Foundation, 1991, pp. xxiv + 257, US\$34.95.
- THE CHRONOLOGICAL ANNOTATED BIBLIOGRAPHY OF ORDER STATISTICS, Volume IV: 1962-1963. H.L. Harter. Columbus, Ohio: American Sciences Press, 1991, pp. viii + 173, US\$95.00.
- THE CHRONOLOGICAL ANNOTATED BIBLIOGRAPHY OF ORDER STATISTICS, Volume V: 1964-1965. H.L. Harter. Columbus, Ohio: American Sciences Press, 1991, pp. vi + 180, US\$95.00.
- THE NEW USER'S GUIDE TO THE SUN WORKSTATION. M. Russo. New York: Springer-Verlag, 1991, pp. 203, DM.69.00.

THERMODYNAMIK. Eine Einführung in die Grundlagen und ihre technischen Anwendungen. H.D. Baehr. Berlin: Springer-Verlag, 1992, pp. xvi + 460, DM.42.00.

TOTAL MANUFACTURING ASSURANCE. Controlling Product Reliability, Safety, and Quality. D.C. Brauer and J. Cesarone. New York: Dekker/Milwaukee: ASQC Quality Press, 1991, pp. xi + 231, US\$55.00.

UNIVARIATE VARIANZANALYSEN. Achtzehn komplette Designs. P. Zöfel. Stuttgart: Fischer, 1992, pp. x + 299, DM.29.80.

VIABILITY THEORY. J.-P. Aubin. Boston: Birkhäuser, 1991, pp. xxv + 543, Sw.fr.168.00/198.00.