REVIEWS AND NOTICES OF BOOKS

Bayesian Inference in Statistical Analysis. By George E. P. Box and George C. Tiao. (Addison-Wesley, Massachusetts), 1973. Pp. xviii + 588. Price $ 19.60.

This book presents the researches carried out by the authors in cooperation with David Cox, Norman Draper, David Lund, Wai-Yuan Tan, Arnold Zellner. Each of the chapters 2 through 10 is based on the research papers, by these workers, published in the journals like *Ann. Math. Statist., Biometrika, J. Amer. Statist. Assoc., J. Roy. Statist. Soc.*, during the years of 1962–68. A good almost-exhaustive long list of these principal references along with other general references is appended at the end of the book.

The use of Bayes' theorem as a basis for statistical inference has been a controversial issue for long and there have been strong opponents as well as supporters of it. But in recent times Bayes' mode of reasoning has found a place of interest in spite of some lingering opposition. As the book reports the research work from the last decade, it has a valuable place among the research workers of this decade. The book can be profitably used for a special two semester graduate course in Bayesian inference, as the prerequisites for studying the book are only the knowledge of elementary probability, usual sampling theory analysis, calculus, and matrix algebra. Sufficient material from the book can even be included in an advanced undergraduate course.

First chapter is devoted to explain the nature and role of Bayesian inference in the general framework of statistical inference, in particular and scientific investigation in general. It considers the choice of prior distributions (specially non-informative ones), the problem of nuisance parameters, and relevance of sufficient statistics. Chapter two forms background to the chapters that follow. Bayesian methods which run parallel to the inferential techniques of usual sampling theory are derived here with equal facility, indeed in better manner sometimes. Chapter three onwards consider certain inferential problems which have not been completely satisfactorily solved by sampling theory. In doing this, the authors say, that they feel that the value of Bayesian analysis may perhaps be judged by considering to what extent it supplies insight and sensible solutions for what are known to be awkward problems. Comparisons between the usual sampling theory results and the corresponding Bayesian results are made everywhere and form a salient feature of the book.

Practically every chapter has some appendices. Every appendix is devoted to some result(s), which is (are) useful in complete understanding of the subject-matter of the chapter but the derivation and/or discussion of which in the main text might have marred the continuity of thought. At the end of the book there are five sufficiently detailed tables in respect of standard sampling distributions. These include the values of F, F, and x^2, x^2 which are not available in the usual text-books. There are separate author and subject indexes. Paper used, printing and get-up of the book is very good.

V. G. TITEKAR.

Differential Equations Theory and Use in Time and Motion. By Alice B. Dickinson. (Addison-Wesley Pub. Co. Ltd., Reading, Massachusetts, 01867, U.S.A.), 1972. Pp. ix + 258. Price $ 10.40.

The above book deals with ordinary linear differential equations of first and second order. The study of motion and the measurement of time are main considerations in this book for studying the physical situations whose mathematical models are the differential equations of the above type.

For an undergraduate student who is not yet exposed to the details of ordinary differential equations but had some training in calculus this book will be helpful. Chapter 1 consists of basic concepts such as function, domain, integral curves, existence and uniqueness of solutions and the solutions of first order linear differential equations. Some good elementary questions which an intelligent beginner can think of such as extension of existence theorem from an open interval to a closed interval have been systematically discussed. Throughout the book firstly physical problems have been considered and then their mathematical models. Most of the physical problems considered are well-known problems such as path of a projectile, Kepler's second law, Newton's second law of motion, motion of a stretched spring, vibrations of a string, etc. The physics as well as mathematics of these problems are discussed in detail. For those who are reading the book at a stretch the author has provided moments of leisure also by giving history of measurement of time, Clepsydra and Carbon-14 dating in Chapter 1 ; example of resonance in Chapter 2 and

the overtones of the membrane of tabla (a musical instrument) with sketches in Chapter 3.

Chapter 2 deals with the ordinary linear differential equations of second order. The contents are essentially the same which form a small portion of many of the books on engineering mathematics or books on basic mathematics.

Chapters 3 and 4 deal with the series solution of the differential equations and convergence proofs of Picard's iterative method respectively.

The book ends with a note of Euler's method and Runge-Kutta method for numerical solution of differential equations.

As a whole, the reviewer feels that this book does not have enough merit over the other books existing on such topics.

S. C. GUPTA.

ANNOUNCEMENTS

Award of Research Degrees

Karnatak University, Dharwar, has awarded the Ph.D. degree in Geology to Shri S. M. Appanagoudar for his thesis entitled "Granite Syenite and Associated Rocks of Koppal Area, Raichur, District, Karnataka State ; Ph.D. degree in Botany to Miss M. Chandani, for her thesis entitled "Some Aspects of Cytology and Cytotaxonomy of the medicinal plants of Sahayadri ranges".

Sri Venkateswara University, Tirupati, has awarded the Ph.D. degree in Chemistry to Shri J. Rajasekhara Rao, for his thesis entitled "Studies on Polyphenolic Constituents of Indian Medicinal Plants" ; Ph.D. degree in Botany to Shri M. Ramakrishna Rao, for his thesis entitled "Physiological Studies on Dormancy in Groundnut Seeds (*Arachis hypogaea* L.) : Metabolic Changes During, After-Ripening and at the Initial Stages of Germination" ; Ph.D. degree in Zoology to Shri Md. Basha Mohideen, for his thesis entitled "Some Aspects of Cellular Metabolism in a Euryhaline Fresh Water Fish, Acclimated to Hetcrosmotic Media".

Osmania University, Hyderabad (A.P.), has awarded the Ph.D. degree in Biochemistry to Shri G. Venkateswarlu, for his thesis entitled "Studies in Trace Elements Metabolism".

The M.S. University of Baroda has awarded the Ph.D. degree in Biochemistry to Shri Dinesh Ghanshyamdas Shah, for his thesis entitled "Nutritional Studies on Pre-school Children" ; Ph.D. degree in Physics to Shri Lanka Hari Hara Prasad, for his thesis entitled "Luminescence Spectra of Heavily Doped KCl : Tl Phosphors" ; Ph.D. degree in Microbiology to Shri Hari Shewaram Chhatpar, for his thesis entitled "Some Problems of Post-harvest Physiology in Mango" ; Ph.D. degree in Geology to Shri Bhaskar Roy, for his thesis entitled "Pattern and Causes of Inundation of the Rann of Kutch".

Utkal University, Bhubaneswar, has awarded the Ph.D. degree in Chemistry to Shri Anadi Charan Dash, for his thesis entitled "Reactivity and Stability of Metal Complexes" ; Ph.D. degree in Botany to Miss Sampuran Kaur, for her thesis entitled "Inheritance of Resistance to Blast Disease in Rice" ; Ph.D. degree in Botany to Shri K. Pavithran, for his thesis entitled "Heredity and Environment-factors affecting Phizotypic Expression of Hotched Kernel in Rice".

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