Book Reviews

Kendall, M., A. Stuart, and *J.K. Ord: The Advanced Theory of Statistics*, Vol. 3. 4th ed. Griffin, London 1983.

As almost all other fields of science the field of statistics has grown rapidly during the last decades. The authors of "The Advanced Theory of Statistics" – with new coauthor J.K. Ord – try their best to keep their work up-to-date. So volume three dealing with analysis of variance, design of experiments, sampling theory, multivariate analysis and time series is now almost a third larger than the preceding edition and one finds references from the year 1882 up to 1981. The style has been kept as readable as before, there are many new examples and exercises and I also enjoyed to find again a good piece of British humour, the matrix on pages 16–17. (Nevertheless, using Kronecker products would make the analysis of variance a little less clumsy.) I liked most the comparably new chapters on time series and least that on design of experiments. Was there nothing after Fisher? The work of Kiefer and his school on optimum design is barely mentioned, Silvey's and Raghavarao's book or Wald's pioneering 1943 paper are not in the references. Similarly, in the chapters on sampling theory I missed references e.g. to contributions by Hoeffding, Rosén or Karlin. From Cochran's book on sampling techniques only the second edition is quoted. Of course, as it is remarked in the preface, it is difficult to know what is permanent and what is ephemeral in the spate of current research. The minor points of criticism above will have no influence on the fact that "The Advanced Theory" will be for a long time a permanent encyclopedia in statistics. It is recommended especially to those who start working in a new field.

O. Krafft, Aachen

Freedman, D.: Brownian Motion and Diffusion. Springer-Verlag, Berlin–Heidelberg–New York–Tokyo 1982, 231 + X p., DM 68.–.

This is a reprint of a classic whose original was published by Holden-Day in 1971. The author notes in his Preface to this Springer edition that three features of his book remained of interest to the readers throughout the years: the constructive and set-theoretic flavor and an extensive use of concrete examples. Indeed, these aspects together with an attractive length of only 230 pages with an appendix of about 40 pages provokes the question: what has been treated in this book and what not? There are two chapters, one on Brownian Motion and one on Diffusion. The main problems discussed in the first chapter include Strassen's law of the iterated logarithm, Donsker's invariance principle, Lindeberg's theorem for martingales, and Wald's famous identity. Chapter 2 covers the semigroup approach to Markov processes, Green's function, diffusion local time and time transformations. The selection of topics might be a little subjective, but after all the book grew out of graduate courses which the author gave at the University of California at Berkeley, and those are limited in level and time. Consequently the reader has to accept "excursions" (Sections 1.9 – 11, 2.10 – 15), "records of personal opinion" (Sections 1.9 and 2.14), the author's individual enjoyment (Section 1.11) and pedagogical additions (like Section 2.15).

The book under review, one volume in a series of three on Markov processes (mainly Markov chains), is of high originality, mainly by its details and examples (speed measure, examples of Feller, McKean and of Breiman). Moreover, in the chapter on diffusion it helps understanding the basic work of K. Ito and H.P. McKean exposed in their 1965 monograph on Diffusion Processes and Their Sample Paths.

The present Springer edition differs from the original version by two points: Small corrections have been carried out and a list of 4 references has been added.

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