Sampling.
Edited by P. R. Krishnaiah and C. R. Rao.
Handbook of Statistics, 6.
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The introduction to this collection of reviews and essays on various aspects of sampling claims it should be “a valuable guide to those involved in designing sample surveys for collection of data and estimation of unknown population parameters”. To my mind it falls somewhat short of this objective. A survey practitioner looking for guidance on how to design a sample and/or how to analyse the data thus collected would be well advised to look elsewhere. This book is more oriented to the researcher looking for background material on major developments (up to about the early 1980s) in sampling theory, being largely made up of review articles by leading sampling theorists on various aspects of sample survey theory. In particular, it contains an extensive coverage of the theory underlying the so-called design-based approach to survey inference, with eleven of the twenty-four chapters in the book devoted to variations on this theme. The topics covered are simple random sampling, unequal probability sampling (general theory as well as theory for a rather specialized application involving construction of samples avoiding contiguous units), systematic sampling (twice), design-based optimality, design-based asymptotics, interpenetrating samples, variance estimation, quantile estimation, and ratio and regression estimation. By contrast, there are only three chapters which espouse the competing model-based paradigm for survey-based inference (one on the Bayesian approach and two on prediction-based methods). To an extent, this somewhat lopsided emphasis is made up by the inclusion of excellent review articles on efficient estimation in a repeated surveys environment and parametric inference based on data from complex samples. There is also a shorter, more directed, article which describes the fitting and testing of ANOVA type models to domain means estimated via complex sample designs. An article on the use of a repeated measurements model for the analysis of interviewer effects is also included, but sits rather uneasily with the rest of the book since the questions it addresses have little or nothing to do with sampling per se.

A feature of the book which sets it apart from “standard” references in sample survey theory is its inclusion of three expository articles on the use of sampling methods in the estimation of biological and environmental resources, as well as a similar article on the
use of sampling methods in marketing research. This recognition that
sampling methods are used in a much wider context than “framework-
based” finite population inference is long overdue. My only quibble
is that the articles on ecological sampling appear to have a number
of authors in common and therefore may not reflect the full range of
applications and problems that exist in this field. For example, no
reference is made to the use of sampling methods in forestry or in
geological and mining applications. In retrospect, the editors might
have been better advised to put less of an emphasis on sampling the-
ory (particularly design-based theory) and more of an emphasis on
sampling practice when soliciting contributions for this book.

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*Raymond L. Chambers (4-SHMP)*