Book Review

Technical Demography by R. Rama Kumar, Wiley Eastern, Delhi.

This book of 218 pages is a collection of fifteen chapters (not necessarily of distinct items) as follows viz., (1) Preliminaries, (2) Age-Sex Composition, (3) Rates, (4) Population growth, (5) Mortality, (6) Life table, (7) Construction of Life tables, (8) Natality, (9) Nuptiality, (10) Migration, (11) Structure of Population, (12) Population Projection, (13) Census, (14) Vital Statistics, (15) Quality of data.

At the very outset one feels that the arrangement of the topics in a Demography Text should follow the natural sequence of Vital Events. For example the fourth chapter in Population growth should follow the chapters on Fertility, Mortality and Migration. Even several topics like Mortality, Life table and Construction of Life tables (chapters 5, 6 and 7) should pertain to a single chapter as 'Mortality Analysis' 'Mortality and techniques for the analysis of Mortality. Similarly 'Natality' and 'Nuptiality' should have been pooled under the title of Fertility and Techniques of fertility analysis. In the same way, chapters on Structure of Population, Population Projection should have been pooled with the chapter on Growth and the measurement of Growth of Population. This would have perhaps ensured the homogeneity of items within the chapters and maintained the sequence of topics in a text book.

In respect of the title of the book, although the author defines the term 'Technical Demography' in the same sense as the 'Techniques in Demography' in Chapter I, but it appears that the author has used the title of his book to cover 'Mathematical (or Statistical) Techniques of Demography'; because many of the techniques used in the book will not be comprehensible by a non-mathematical reader who may deal (or profess) with the methodologies in demography. The text has made excellent beginning while distinguishing between •Rate' and 'Ratio'—a very fundamental concept. However, on page 23, the way in which the author has introduced 'rate' has given the 'rate' the same significance as that of 'Probability' in the classical sense. Yet, a rate need not be probability but ideally attempted to be a 'time bound' probability. Indeed 'time' is the concept which distinguishes a rate from a ratio which has not been explicitly mentioned in Chapter III. It is also true that a rate need not be a

time bound probability (example, conventionally defined mortality rate or the crude birth rate); but time is the essential feature which distinguishes the same from ratio.

Again in chapter four on population growth, the author has perhaps little abruptly introduced models of population growth as 'Gompertz' and 'Logistic' without focussing on their motivations. Description of the methods of fitting logistic although quite extensive need not be exhaustive. Mention of important methods as (1) Rhodes' method, (2) Methods of 'Sums of Reciprocals', (3) Methods of Fisher, Yale, Nair etc., categorizing different approaches adopted in the fitting of Logistic has not been given their due importance. Especially, the special type of regression (when both the explanatory variables and the dependent variables are subject to errors) adopted by Rhodes while fitting a Logistic is worth mentioning both from the point of view of demography as well as statistics.

In the chapter on 'Mortality' although indices of mortality have been well presented, one of the most important index of mortality viz. Infant mortality rate (IMR) and the techniques for its adjustment (calender correction) have not been presented at length. In chapter on Life Table the methods of construction of complete and abridged life tables have not been distinguished in a clear cut manner. Different approaches in the construction of abridged life table (for example King's method and other actuarial methods fall in one category whereas abridged Greville, Greville and Reed and Merell's formula fall in another category) have not been distinguished. Again important methods in the construction of complete Life Table by 'Census' and 'Calender method' have not found their places for the benefit of the researchers. A few words on the historical account especially relating to the construction of abridged life table in India based on 1% *Y* Sample (Sample by Yates) during 1941 and presented by Kingsley Davis in 'Population of India and Pakistan' would have added to the value of the book very considerably.

Finally in the derivation of relationship between life table functions, a reader may experience considerable loss of rigors. For example, results (6.21) to (6.25) are only approximate relations but no mention of the same is available in the text. In the chapter on Natality, the rates have been well presented in proper sequence, together with the physical significance of the same. While deriving the relation between TFR and CBR presented in art. 8, page 192, the author points out that TFR ignores the age distribution. However, with the same token, GRR and NRR will also be so; but no mention of the same has been made. While defining the correlation between $C(x)$ and f(x) in page 92 again, the author has not been careful in maintaining the rigor; for the correlation, what he has defined is based on the assumption of uniform distribution of proportion of persons in a specific age group $C(x)$ as well as the age specific fertility rate f(x). This should have been explicitly mentioned.

Other, well chosen items included in the chapter is 'Parity Progression Ratio'

(8.9), 'Length of Generation' (8.12), Open Birth Intervals (8.15.4) and Cohort fertility (8.16). A few lines distinguishing 'Length of the Generation'and 'Mean Age of Childbearing' on page 98 would have been little more illuminating. A few references on 'Open' and 'Closed' Birth Intervals and 'Parity Progression ratio' would have stimulated the learners in the subject to further reading. Finally, an important omission in this chapter is the concept of 'Net maternity function' by Wicksell and others and their uses in the analysis of Fertility.

The chapter on migration has been covered with different indices of migration. But it is an item where the author could have introduced Stochastic analyses on migration using Markov and Semi-Markov chain models, especially, when the book was intended for mathematically mature readers.

The Chapter XI entitled 'Structure of Populations' requires explanation; since the techniques appended in the same chapter may not determine or predict the structure of a population; especially when the author has covered the chapter with the contents of Lotka and Dublion's Stable Population analysis (with little addition of Quasi stability), and the parallel Leslie matrix (L-matrix) approach valid for a stable population, only different approaches of Coale in Quasi stable population analysis as well as Leslie's further work (1948) producing the L-matrix valid for density dependant or time dependant fertility and mortality parameters would have been necessary to justify the title of the chapter. Equally the chapter on structure of the population should have included some reflections about populations (as well as Indian population) which are in different phases of population growth.

Finally, the last chapter on Vital Statistics, Census and Quality of Data are highly informative excepting that the Reviewer feels that in some places (e.g. 15.3.1—Chardrasekharan and Deming's formula etc.) the author should have expanded the ideas. In Chandrasekharan and Deming's formula there was still scope for discussing the correlation in reporting between two independent agencies and the method to remove them.

In summary, the book is a very useful addition to the teaching and research material in demography, especially, when the lack of adequate text books covering all facets is increasingly felt.

Professor in the Mathematical Statistics Department,
Delhi University,
Delhi-110007

S. BISWAS