

REVIEWS

Addendum to Demography. By PETER R. COX, F.I.A.

[Pp. viii + 64. Cambridge: Published for the Institute of Actuaries and the Faculty of Actuaries at the University Press, 1955. 5s.]

THIS Addendum is published none too soon for the student who is taking demography in the examinations, as the problem of keeping abreast of current developments in so young a subject is formidable. The volume is essentially a digest of the main demographic publications in this country during the six years 1949-54, together with some references to the increasingly valuable work of the United Nations Organization in the sphere of international population statistics. The period covered by this book saw two events of major importance to British demographers: the appearance of the Report and Papers of the Royal Commission on Population, and the publication of the first volumes of the 1951 Census. As the author rightly says, there are few branches of demographic knowledge that have not been developed as a result of the work of the Royal Commission; the One Per Cent Sample tables of the 1951 Census were of particular interest as they required the employment of sampling techniques on a large scale.

More than a quarter of the book deals directly with fertility and marriage; this part will be of particular value to the ordinary student who, though accustomed to dealing with mortality or morbidity, finds difficulty when faced for the first time with problems involving marriage, fertility or population replacement. The difference between 'stock' and 'flow' is well brought out; the student is warned that using one type of information to the exclusion of the other may be misleading, and that the Royal Commission's 'replacement' rate technique is a delicate instrument for use by the expert. In the chapter on marriage the author points out that divorce is far more important than death as a cause of termination of marriage at ages under 50, a fact frequently overlooked by students.

The Addendum is divided into chapters corresponding with those in the original book, and it would have been better if the titles had been repeated at the head of each chapter. Some passages in the main volume are superseded by the Addendum, or have become less important with the lapse of time. According to the preface, the author intends to mark these passages with an asterisk when a complete new edition is published. In the reviewer's opinion, it would be more helpful to the student to omit these passages, even at the cost of leaving corresponding blank spaces in the text.

Mr Cox deserves the gratitude of all students for having condensed so much material into so little space without any sacrifice of essentials. The bibliography and index are again excellent.

O.D.C.

The Taxation of Gifts and Settlements (including Pension Provisions). Second Edition. By G. S. A. WHEATCROFT, M.A., a Master of the Supreme Court (Chancery Division).

[Pp. xxix + 194. London: Sir Isaac Pitman and Sons, Ltd. 1955. 42s.]

IN the preface to the first edition the author reminded his readers that, at the present time, the importance of knowledge of taxation law can hardly be over-emphasized, and his book contains many examples which show how some

ordinary transaction, quite unconnected in its origin with taxation, may nevertheless have entirely unexpected taxation results.

There is much to commend the suggestion made by the author that the book should be read as a whole rather than treated as a work of reference, for the reader must indeed be already well-informed if he cannot in these pages find some legal point or matter of practice which has previously escaped his attention.

In Part I the author treats of the structure and main principles of stamp duty, income tax, surtax and estate duty and in Part II he shows the effect of the four taxes on gifts and settlements of various types of property, including life policies and interests in pension funds. He devotes one chapter to the trends of future taxation and completes the book with useful appendices and a good index.

Although the author shows how, in many ways, the citizen may reduce his taxation burden within the limits of the law, his approach is nevertheless moderate and restrained. He reminds the reader, for example, that the great majority of the population of the United Kingdom is little affected by estate duty, for an estate of £10,000 pays at 4% only and only $2\frac{3}{4}\%$ of the population leave estates of a higher value. He quotes, moreover, the words of Lord Greene, M.R., who said: 'It scarcely lies in the mouth of the taxpayer who plays with fire to complain of burnt fingers.'

The writer of this review does not, however, accept the view of the author that the Finance Act, 1894, section 2 (bringing within the charge to estate duty various types of property which do not pass on death) was necessary because otherwise 'normal' liability to duty would be avoided. The author gives no definition of his view of 'normal' liability. The liability to duty (irrespective of any 5-year or other period) of policy money under a policy effected and kept up by the deceased for the benefit of a donee can hardly be regarded as 'normal', especially as a series of gifts of sums equal to the premiums would usually escape duty altogether as being 'normal' and reasonable. The example given is one of many which might be put forward to emphasize that reconsideration by the legislature of the effect of estate duty is long overdue, especially in view of the sharp increases in the rates over the past few years.

The work is attractively printed and bound, and as the author is generous enough to acknowledge assistance from various earlier reviewers and readers, he may like to consider for the next edition:

- (a) the addition of a reference to the Revenue Act, 1889, section 19;
- (b) a note on the special treatment of conveyance duty on policies mortgaged to the issuing Life Office;
- (c) a correction of the obvious slip on page 146 in the rates of stamp duty on superannuation annuities.

Many will be grateful to the author for his lucid and comprehensive exposition and will be glad to have his work on their bookshelves.

D.H.

An Introduction to Stochastic Processes with Special Reference to Methods and Applications. By M. S. BARTLETT.

[Pp. xiv + 312. Cambridge University Press, 1955. 35s.]

THIS is an outstanding book. It is the only comprehensive treatment of this subject, in English, which is suitable for persons of moderate mathematical attainments. This is not to say that the mathematics in the book can be mastered easily, but the author has taken pains to simplify the presentation as far as pos-

sible and has not indulged in over-precise rigorousness at the expense of the main line of argument. So successful has he been that the hard work lying behind the final form of the book may not be appreciated by all readers.

The author defines a stochastic process to mean in the first place 'some possible actual, e.g. physical, process in the real world, that has some random or stochastic element involved in its structure', and secondly as the mathematical model appropriate to such a process. A number of examples of such applications of the theory are given, from such diverse fields as communication engineering, population growth, epidemic theory and queue theory (and one short example from the theory of risk). Despite the fact that the bulk of the book is concerned with the theory of stochastic processes the use of the theory in applications is always kept well in mind. There are two chapters on statistical inference for stochastic processes. The second of these covers the correlation and periodogram analysis of time series. The first is concerned with the as yet comparatively undeveloped field of analysis of Markov and other chains. Unfortunately, few examples of application of statistical techniques to real data are given. The author himself mentions this with regret, but it is a pity that efforts were not made to secure a more abundant variety of examples. This, however, is a minor blemish in an excellent book. It is also possible that the general arrangement of the contents could be improved, though the development of each separate topic is usually of unimpeachable clarity.

There is a short introductory chapter followed by a chapter on random walk, and in particular on Markov chains, and another chapter on the processes continuous in time which are analogous to these. The next chapter contains examples of applications of the models so far developed. The fifth chapter is mainly mathematical, being a discussion of 'Limiting Stochastic Processes'. The sixth chapter, on 'Stationary Processes', is a remarkably clear exposition of this subject and makes this chapter, in the reviewer's opinion, the most valuable in the book. There follows a chapter on prediction and communication theory, and the chapters on statistical inference to which reference has already been made.

Summing up, this book can be recommended as a valuable introduction to most of the topics now included under the general title 'Stochastic Processes'. For the reader with a fair aptitude for mathematics an allowance of two hours reading time, more or less, per chapter should suffice for a good understanding of the contents. There is a further volume in preparation, by J. E. Moyal, on the basic mathematical theory, but the present work is practically self-contained, for all but the most earnest seeker after mathematical precision.

N.L.J.

Foetal, Infant and Early Childhood Mortality. (United Nations Population Study, Series A, No. 13.)

Volume I: *The Statistics.*

[Pp. vi+137. New York, 1953. 11s.]

Volume II: *Biological, Social and Economic Factors.*

[Pp. iv+44. New York, 1954. 3s.]

REPORTS on about twenty topics have already been issued by the Population Division of the United Nations Organization. One—*The Determinants and Consequences of Population Trends*—has recently been reviewed in the *Journal*.* Apart from four that have dealt with the particular circumstances of the Trust

* *J.I.A.* 81, 94.

Territories, such as Western Samoa, all of them have been of general application and have been concerned with either international population statistics or methods of their analysis. These reports are new in conception and are well adapted to meet the demand for information that has arisen from the developments and problems of the post-war period.

In the pair of volumes now under consideration, every aspect of reproductive wastage and loss of infant life is touched upon. If the technical troubles associated with relating infant deaths to their true exposures to risk are treated rather lightly, this is no doubt because they have received more attention in another United Nations publication recently—*The Population Bulletin*, No. 3 (1953). The purpose of the study, however, is not merely to present the statistics but to point the way towards reductions in losses of life which, in the world as a whole, amount to at least 20 % before birth and not far short of 20 % after birth. With this aim in mind, the theme is developed from a simple description of the data and their trends, through complex analyses of associations with social and economic influences, towards a final chapter in which the main implications of the experience are discussed.

The first of the two volumes sets out the available data fully and gives a clear description of the many problems of definition, registration, tabulation and computation. The most difficult subject of all in this connexion is probably that of abortion; in a section specially contributed by Dr Tietze, information from a number of sources is collected together more for the purpose of indicating the extent and limitations of knowledge than to give an exhaustive account. The emphasis is again on difficulties where stillbirths are concerned. Variations in the interpretation of signs of life and of the length of pregnancy at which a stillbirth may occur, and differences in registration procedure and completeness, account for the fact that recorded rates vary from about 70 per 1000 live births in Japan to less than 10 per 1000 live births in Bulgaria. The current figure for Great Britain is about 23 per 1000.

Apart from deaths in early life that are wrongly reported as stillbirths, the data of mortality in infancy and childhood, where they are available, are much less open to doubt than those of reproductive wastage, and it has been possible not only to include detailed information about them but also to discuss medical causes of death—together with suitable warnings about errors of diagnosis. When so much is known nowadays about the prevention of disease by simple precautions, however, the true causes of loss of life in under-developed lands whose infant deaths, although often unrecorded, undoubtedly constitute the major part of the world total are seen to be social and economic. For this reason the second of the two volumes is both interesting and important. It deals first with the influences upon infant mortality of biological factors such as the age of the mother and the number of children she has already had. (Since this work was published, more comprehensive and modern statistics for England and Wales have been published by Morris, Heady and others in the *British Medical Journal* this year.) The importance of environmental conditions is illustrated by a graph in which infant mortality is plotted against mortality after the first year of life for 250 countries. The correlation between the two is as high as 80 %, although as this is based on a single-figure index for all years of life after the first it must be regarded as being dependent to some extent on the nature of the particular index (e_1^{-1}) used.

The second volume goes on to deal with social and economic factors; those for which statistical evidence is furnished include urban-rural differences,

illegitimacy, nutrition, housing, literacy and intelligence, income, occupational status and social class. These more sophisticated illustrations are necessarily drawn almost entirely from the experience of Western countries, and their contribution towards the major problem of saving life in other areas is open to doubt. The analysis in the following chapter of the cost of bearing and rearing a child is even more heavily dependent on experience in two countries—Great Britain and the United States of America. Nevertheless, such information as is available has been presented, and it is valuable to have it all together in one place.

The effects upon the demographic characteristics of under-developed lands of advances in infant welfare are not overlooked, and due reference is made to the possibility that such advances may bring misery in their train in the shape of a greater proportion of dependants to workers and a greater number of mouths to feed from supplies that are already barely adequate. For the moment, however, the fairly high correlation between the death rates early in life and those at older ages seems to indicate that reductions in infant mortality have not so far had a disastrous effect.

P.R.C.

Handbook of Population Census Methods (United Nations Study in Methods, Series F, No. 5).

[Pp. vii + 143. New York, 1954. 11s.]

TWO works dealing with censuses have already been published by the United Nations Organization. In the *Population Census Handbook*, Provisional Edition, of 1949 a first attempt was made to gather together useful information from all parts of the world, so that it could guide those responsible for the many enumerations of 1950 and 1951 towards the production of results of greater effectiveness and comparability. *Population Census Methods* also appeared in 1949 and provided a more detailed discussion of the concepts and uses of certain items. The new *Handbook* that has now been made available is in the main a fresh edition of the *Handbook* of five years ago, but it also incorporates some useful tables from the second study of that time. It seems rather unfortunate that continued demand for the assistance of the expert staff of the United Nations Organization has led to the preparation of the present revised edition while it is still too early to describe the practices that have been followed in the latest round of enumerations, although the difficulty has been partly met by setting out international recommendations which it is understood have considerably influenced the actual course of events. Before long there will clearly be scope for a further publication dealing with the most recent developments, and indeed there will always be reasons for keeping such an important analysis up to date.

The general plan of the new *Handbook* is to provide, in thirteen chapters, information relating to separate census items, such as definition of total population, analyses by sex and age, classifications according to economic characteristics, and so on. Each of these chapters gives, after a short introduction, the full details of the recommendations of international agencies for the collection of data, and then adds statements showing the particulars of actual compilations in each country. There are also five general chapters, of which the principal one is concerned with methods of planning and administration. A brief survey of the main advantages and disadvantages of sampling is included.

P.R.C.