REVIEWS

The Biology of Life Span: a Quantitative Approach. By L. A. GAVRILOV and N. S. GAVRILOVA (Harwood Academic Publishers) £62.

The authors, a husband and wife team, have produced an interesting and carefully argued book which brings together the conclusions of many works of the past, and disagrees with a high proportion of them.

After an introductory chapter, there is a long study entitled 'Individual differences in lifetime', which perhaps anticipates too much of what is to follow. To start with it is not clear that any distinction is being made between observed lifetimes and the life spans which might be attained if there were no external or environmental factors, although the distinction becomes obvious later in the book. In stating their conclusion that life span is *not* normally distributed, the authors do not state that what R. D. Clarke and others have termed 'anticipated deaths' do not form part of the life span distribution, although they mention that environmental factors can be more important than genetic ones. In one small section they do refer to lethal situations, but assume that the effect of these is constant, independent of age. In fact Chapter 2 is really part of the introduction, as becomes clear later.

Much of the meat is in Chapter 3. The appropriateness of the Gompertz–Makeham law over a large range of ages is demonstrated, both for humans and for animals. An attempt is made to separate biological from ecological effects in various countries, by examining changes in observed parameters over a period of time, but assuming that all the age-related elements of the observed deaths are biological, and that all the ecological elements are, at any one time, independent of age and similar for both sexes; it is never conceded that the effects of some ecological factors could vary with age. A criticism is made of the 'endogenous and exogenous causes approach' made by Bourgeois-Pichal, who classified all malignant neoplasms as endogenous causes. It is accepted that it is impossible to separate each death into one of these two groups.

There follows an interesting theory that a reduction in mortality from one set of causes might be compensated by a growth in mortality from another, with no resulting net change in life expectancy. Examples are given, and the conclusion reached—perhaps a little hastily—that causes of death can be ignored in the prediciton of human mortality, without any consideration of the distinction between staving off death after tissues have been damaged, and curing before such damage has occurred (or preventing the disease in question from occurring at all).

The next chapter discusses estimates which have been made of human life span, and concludes that they are unsuitable for scientific research because there are so many discrepancies between them. What is preferred is 'the largest characteristic life span equal to the last remaining alive out of a sample', but no mention is made that even this death at a very old age could have been to some extent anticipated.

There follows a fascinating study of the works of various authors, and the underlying theme is that there is no firm upper limit to possible life span, and that if biological life spans could be measured their distribution would not necessarily be normal. Of course it would not, as some genetically caused deaths at young ages would make the distribution skew, but it could still be approximately normal over much of the age range, with the upper extremity of the quasi-bell shape reaching up to infinity; but the authors do not say this. They discard the hypothesis of 'programmed death' although it could still be valid; they discard it on the basis that it presupposes the self-destructive process to be 'switched on somewhere between 40 and 50', but this presupposition is not essential to the hypothesis, as the self-destructive process may well operate from birth, or indeed from conception.

An analysis of animal statistics indicates that for some animals there is no sex difference in life spans.

The whole book is a workmanlike production which should stimulate comment and discussion. It is well set out, well expressed, translated into easy-to-read English, and gives the tables in their right

places where they are close to the relevant texts. I would have liked the copious references (occupying 41 pages) to indicate by paragraph where in the text each reference occurs, but perhaps this would be asking too much.

This book should be read by all members of the profession interested in mortality—which should be all members of the profession.

H. A. R. BARNETT

The Insurance Sourcebook. Compiled by ROBERT CUNNEW (Longman in association with the Chartered Insurance Institute, 1991) £35.00.

The Insurance Sourcebook is compiled by Robert Cunnew, Librarian at the Chartered Insurance Institute, whose 20 years' experience of working with insurance information has eminently fitted him for the task. The book 'aims to address all needs for information on insurance, both inside and outside the industry'. All areas of insurance are covered, together with a wide range of related fields, for example, pensions. 'Information' is defined in the broadest terms so that organisations, conferences and training courses are included as well as books and data-bases.

The book is divided into two sections. Section 1, 'Organisations and individuals', is subdivided by type of organisation into 'Official sources' (i.e. intergovernmental bodies and government departments), 'Associations', 'Colleges and universities' and 'Commercial sources' (including consultants, market researchers, publishers and recruitment specialists). Section 2, 'Publications and services', comprises 'International congresses', 'Publications' (bibliographies, periodicals, reference books and textbooks), 'Computer-based services' and 'Libraries and information services'.

The book is valuable for bringing together information hitherto scattered throughout a multitude of difference reference books. The section on national associations, for example, is the most comprehensive directory available of insurance and related associations in the U.K. As such, *The Insurance Sourcebook* will be indispensable on the reference shelves of business libraries and information units in the insurance industry.

However, when judging the book's actuarial content, I have some reservations about its accuracy and comprehensiveness. The entry for the International Actuarial Association gives an out-of-date address. Astin is listed as a sub-section, but not AFIR. *Astin Bulletin* is the only IAA publication listed. Neither *IAA Bulletin* nor *IAA Index* are mentioned here or anywhere else in the publication. The section on international congresses claims to include 'regularly held conferences and meetings which are international in terms of speakers, delegates and papers and at which attendance is not restricted to the members of a particular association'. However the AFIR Colloquia do not feature. The selection of publications includes almost no actuarial titles. The *Claims Reserving Manual* appears in a section entitled 'Administration: accounts and finance' rather than in the one entitled 'Claims'! The publicity claims the book 'has comprehensive and detailed indexes', but the CMI Bureau has neither a separate entry nor does it appear in the index to guide the reader to various scattered allusions.

In the fast-changing world of financial services, the information in a publication such as this dates quickly. When a new edition appears it is hoped that the actuarial content will be carefully revised to increase even further the book's usefulness.

S. GROVER

A Handbook of Financial Mathematics. By PETER C. CARTLEDGE (Euromoney Books) £85.00.

The aim of this book is to give a wide range of users a self-help guide to various calculations underlying treasury and capital market operations. In order to retain wide appeal, the mathematics of these calculations is stringently down-played. In place of mathematical formulae or symbolic notation, the book explains each operation by describing the steps, keystroke by keystroke, on the Hewlett-Packard HP12C calculator, making extensive use of the calculator's financial functions.