

## REVIEWS

*An Introduction to the Mathematics of Finance.* By J. J. McCutcheon and W. F. Scott.

This book is the successor to D. W. A. Donald's *Compound Interest and Annuities Certain* which, for many decades, formed the cornerstone of actuarial training in compound interest.

The new text, which has displaced Donald's book in the official examination reading list, draws together all the material necessary for the current syllabus and is, therefore, a welcome improvement on the collection of *Special Notes* that had previously been used to supplement Donald.

The main difference between McCutcheon and Scott's text and its predecessor, is the authors' approach to compound interest "as a special case of a more general model" in which the interest rate is continuously variable. And herein lies the major complexity of the book.

Because the book begins with the general model, it is not until Chapter 3 ("The basic compound interest functions") that we meet the actuary's familiar friends  $i$ ,  $v$  and  $d$  etc. Having made their acquaintance, they remain with us through all the familiar territory of annuities-certain, loans, capital redemption policies, securities and cumulative sinking funds which occupy Chapters 3 to 9. It is really only in Chapters 10 and 12 on immunization and stochastic models that the general model becomes of any relevance again.

One cannot help but wonder whether this is the best approach to the subject. Readers who enjoy mathematical theory will, no doubt, welcome the new approach in the introductory chapters. But, for those who regard the mathematics of compound interest as a tool rather than an art form, the subject would have been more easily met if the book had been in two parts: the existing Chapters 3 to 9 (minus the esoteric mathematical theory) and Chapter 11 forming the core material, to be followed by a theoretical treatise comprising the remaining chapters plus the mathematical theory deferred from the earlier chapters. This approach would also have made the book suitable for those other professions (e.g. accountants and stockbrokers) which the front sleeve claims, rather optimistically perhaps, are among the intended audience.

So much for the book's structure; the book is well-written, makes good use of graphs and illustrations and the text is very readable—unusually so, for what is, effectively, a textbook of mathematics.

The greatest strength of the text is undoubtedly the refreshing and enthusiastic way in which the authors set about demonstrating how complex problems can be reduced to a manageable form and, most importantly, solved. Each chapter contains a healthy sprinkling of worked examples and, in addition, almost one-third of the book's 450 pages is given up to worked solutions to the exercises (often to exam standard) set at the end of each chapter. I particularly liked example 7.6.5 which contained no less than four alternative solutions to a particular exercise. This was a most instructive way to demonstrate to students the importance of formulating a problem in the simplest way.

The text has now been in use by actuarial students for a complete session and, in the experience of this tutor at least, there has been a marked improvement in the quality of students' problem solving. If this experience is typical, the profession will owe a debt of thanks to the authors for many years to come.

SIMON CARNE

*Pensions: The Problems of Today and Tomorrow.* By B. Benjamin, S. Haberman, G. Helowicz, G. Kaye and D. Wilkie. (Allen & Unwin, London)

For many years British actuaries have appreciated the importance of pensions not only from the viewpoint of protecting living standards but also because an increasingly high proportion of the nation's savings is being (and will be) required to provide that protection.

In recent years there has been a considerable increase in public awareness of pension problems largely following Government involvement and media comment.

Government involvement, together with competition for provision of services, have contributed to the present, perhaps unnecessarily complex, situation.

This book expertly describes the tortuous route followed to date, makes a skilful survey of the surrounding landscape and proceeds with a reconnaissance through the very rugged territory that lies ahead.

The book provides an extremely clear summary of the changing problems from the time of the Aberdare Commission reporting in 1895 that pensions should be left in the hands of the Friendly Societies, through the more recent times of accelerating complexities, to 1988 (and beyond) when the Government is taking the first hesitant steps to reduce the heavy prospective burden which it now realises may have been placed on future generations.

It is based on the Report which created such a lively discussion at Staple Inn in June 1985 and it is interesting to consider the book in the light of the synopsis of the discussion reproduced in *J.I.A.* 112 (pp. 407-19).

During that discussion several speakers were critical of certain aspects of the Report but the authors have gone a long way towards meeting these early criticisms.

In particular the book excludes the joint summary which the authors frankly acknowledged had been a mistake in the original Report.

The macroeconomic aspects of funding, pension fund investment, the taxation of occupational pension schemes, the demographic outlook and its effect on future dependency and expenditure are all expertly covered by actuaries who have presented the problems in a refreshingly constructive manner after careful assessment involving the collation of research by other experts together with valuable original research.

Each of the authors has been directly connected with education in actuarial matters.

There is no doubt that this experience has assisted in producing a book from which even specialists in the pensions field will learn much.

It is unreservedly recommended both to pensions actuaries and also to actuaries who are not at present directly involved in pensions work.

R. W. SCADDEN

*People Count. A History of the General Register Office.* By Muriel Nissel (HMSO).

This well illustrated and informative book describes the history of the General Register Office from 1837 to the present day.

It is likely to create a renewed interest not only in the often surprisingly wide range of statistics available, but also in their interpretation.

The pre-1837 position and the reasons for the establishment of the GRO are described as is the civil registration system.

The 1753 Census Bill and the Malthus controversy leads into the subject of population projections and there is an important chapter on mortality and fertility variation.

Perhaps less familiar to actuaries are the extensive Social Surveys and Health Statistics and the wealth of information contained in these.

The continuous Family Expenditure Survey providing weightings on which the Retail Price Index is based and also the International Passenger Survey providing information for the tourist and transport industries are examples of the varied work done.

It is only to be expected, however, in a volume commemorating the first 150 years of this complex organisation, that emphasis is placed not only on how the GRO has adapted to the needs of society but how changing society is reflected by the figures and documents produced by and for the GRO. It is often the documents rather than the figures which bring the past to life most vividly and, as many of us know, the early Census returns contain illuminating information concerning our family histories. We are thus allowed a glimpse of records reflecting the lives of our great-grandparents and their forebears and this attracts large numbers of visitors to the Public Records Office.

The high standard of writing is complemented throughout by thoughtful editing and imaginative graphic design and consequently the book deserves to achieve a wide readership.

R. W. SCADDEN

*Living with Risk, The British Medical Association Guide.* By Dr Michael Henderson (John Wiley and Sons)

This book was clearly written with the objective of bringing an important subject (about which there are many misconceptions) to the many readers who are likely to be interested in risk as well as those who may become involved in risk-measurement as part of their employment.

The range of the subject is vast and hence the treatment of individual aspects is inevitably superficial. Nevertheless there are bibliographies covering each chapter which would be invaluable for further research.

Mortality risks are incurred every day; occupational risks, risks in transport, risks in the home, recreational risks and risks in medicine and surgery. Perhaps more interesting for actuaries (and underwriters) are the chapters dealing with the measurement of risk, the perception and acceptability of risk and the management of risk.

The more recent proliferation of chemical risks, risks from radiation and new diseases are discussed. This includes those arising from the Chernobyl disaster and the spread of the Acquired Immune Deficiency Syndrome.

More importantly, perhaps, an attempt is made to place the various risks into perspective.

R. W. SCADDEN