central to the author's thesis. He develops the argument that 'damage' is a reduction in the overall utility of a person's life plan, and that 'damages' by way of monetary payment provide a substitute for what has been lost. The thesis suggests a new meaning to the accepted objective of monetary damages of achieving *restitutio in integrum*. The author interprets this as seeking compensation which will, as far as possible, restore the overall utility of the plaintiff's life plan to what it would have been had there been no injury or death. In this context, actuarial calculations are a tool of utility analysis, assisting in the determination of a present financial equivalent for the utility of the life plan which has been lost.

The work is intended for legal rather than actuarial readers, and those with no legal training and who are unfamiliar with the theory of utility will find the early chapters heavy going. The English reader will also be hampered by extracts from judgments and other sources in Afrikaans, and there are, unfortunately, a considerable number of printing errors.

Chapters 4 to 11 deal with financial and technical matters, and will be of general interest to actuaries outside South Africa who are practitioners in this field. In contrast to the position in the United Kingdom, there is, in South Africa, a 'heavy reliance by the courts upon actuarial evidence'. The author argues consistently with his general thesis that actuarial calculations are concerned with the valuation of chances, in respect of the individual claimant, which are relevant to the utility of his life plan before or after the injury. He is critical of those of us who have employed a 'mortgage repayment' model (or, in his words, a 'consuming interest and capital' approach) in an attempt to justify our results and break through the courts' inclination to reject actuarial calculations as based on averages and not relevant to the individual. He strongly advocates the 'actuarial year-by-year method', which we all use as the primary basis of assessment.

There are some unintentional moments of humour for the U.K. reader, occasioned by the author's lack of personal experience of hostility to actuarial evidence in the courts. He attempts to analyse the fears underlying this hostility, but concludes that "such fears may be appropriate when dealing with a jury, but of dubious relevance when dealing with a highly educated judge"!

One interesting byproduct of the author's approach is that collateral benefits (e.g. employer sponsored or personal life assurance and pensions) should be deducted from damages, because they enhance the post-injury utility of a life plan. This is not the current position under either South African or U.K. law.

The final chapters, 12 and 13, examine in detail the techniques and legal aspects governing the assessment of damages for personal injury and loss of support arising from the death of a breadwinner. They relate primarily to the law of South Africa, but are of general interest to an international readership.

JOHN PREVETT

Unapproved Pension Schemes. By A. LANGLEY and R. K. MULCAHY (Butterworth Law Publishers Ltd., 1994) £65.00

In the Finance Act 1989 the Chancellor of the Exchequer introduced a cap on the benefits which could be paid to a company's employees from an approved pension fund. This book describes, in considerable detail, how companies can approach the problem of how to replace the benefits which would have previously been paid by its approved pension fund.

A simple example, in Chapter 1, illustrates how the linking of the earnings cap to retail price inflation will mean that an increasing number of pension fund members in the future will be caught by the new legislation. So, while the present book applies to a relatively small number of individuals now, it (or a successor) will become an increasingly important reference for pensions actuaries.

The book is effectively divided into two halves. The first half deals, in great detail, with the intricacies of the tax legislation as it applies to a variety of unapproved pension arrangements. Because of this complexity, I felt that the 'business advisers' referred to on the back cover as the target readership for this book would really need to be a quite highly specialised subgroup. This is not meant to be a criticism of the book, but just a view that it would be improper for a non-specialist to be giving advice on such a complex area.

The second half of the book deals with more practical issues, covering establishment and administration, investment and benefit design, and provides a comparison of the different approaches to unapproved pension funding. To a non-specialist such as myself, this provided the meat of the book.

The chapter on investment paid particular attention to the differences in approach as compared with approved pension funds. For example: the authors recommend that the appropriate range of assets may be quite different; and the average age of employees and the greater importance of lump sum benefits results in a shorter time horizon and a need for greater liquidity in the fund.

A particular point which received little discussion was the high degree of risk which an unapproved scheme must bear as a result of the small membership. In my view, this provides the greatest source of uncertainty in the problem of funding such a scheme. In contrast, the level of detail which goes into the investment assumptions described in paragraphs 11.47 to 11.50 seems quite inappropriate. (Paragraph 11.47 also contains a wonderful self-contradictory expression: 'prudent best estimate basis'.)

Chapter 15 describes how the initial preference of companies for unfunded arrangements is gradually being replaced by funded schemes. As the authors rightly point out, this can only work to the good of the membership in providing greater security.

Looking through the comprehensive glossary, I was surprised, indeed disappointed, by the authors' narrow definition of an actuary. This made no mention of the need to quantify investment and salary risk; factors which are probably far more significant to a pensions actuary than those mentioned in the glossary's definition.

This book should provide a very valuable source of reference for anyone who offers specialist advice on unapproved pension schemes. The authors note the numerous areas of discretion and ambiguity in the legislation. It is, therefore, likely that new regulations will appear on a regular basis, so I hope that the authors will endeavour to keep the book as up to date as it clearly is at the moment.

ANDREW J. G. CAIRNS

A World of Propensities. By KARL R. POPPER (Thoemmes Antiquarian Books Ltd., Bristol 1990) £5.99

Karl Popper died in 1994 after a long and distinguished life of high standing in scientific and philosophical thought. His basic concepts in philosophy stemmed from deep thought in scientific methods starting mainly from mathematical approaches. In particular, much of his work stemmed from analysis in depth of theories of probability.

This book, *A World of Propensities*, is a printing, somewhat lengthened, of two papers delivered in recent years, and is only fifty-one pages long. The first of the two papers (which gave the book its title) should be read, absorbed and digested by every actuary. It was delivered to a meeting of the World Congress of Philosophy at Brighton in 1988.

Scientific thought in general is coming more and more to depend on probability theory. It is necessary, for example, to an understanding of quantum theory; but is probability theory, as applied to the real world, sufficient in its purely abstract development? It is this question that Karl Popper examined in his lecture.

It deals, not only with the mathematics of probability such as are obtained by tossing a coin numerous times, but with what he terms 'innate propensities'. The example he starts with is that of tossing a die. If the die is evenly made, with totally even weight distribution, then each number should tend to come up with the same frequency on the die being tossed a very large number of times. However, if one side is weighted differently, for example with a small lead weight being inserted just under the surface of one side, then the distribution will be affected. It will be affected, not only as a result of the uneven weight distribution, but also by the surface on which it is rolled; a hard, perhaps slightly sloping surface against, perhaps, a surface of loose sand.