emphasis of the industry has been on the savings aspect of life assurance, particularly in the unit linked sector.

Within the last decade, the unit linked companies have increasingly introduced protection elements into their product design, and following the removal of Life Assurance Premium Relief on 13 March 1984 the authors believe that the whole industry will need to pay much more attention to its unique feature—the offering of life assurance protection.

The paper examines the two broad categories of additions to a basic contract—additional benefits (or rider benefits) and options.

The most significant additional benefits are waiver of premium and the various forms of disability benefit. Also included are comments on accidental death benefit; unemployment waiver; medical expenses and hospitalization benefit. The paper considers aspects of pricing but concentrates on design of benefits as well as underwriting and claims control. These matters are more complex and difficult than in the area of ordinary life assurance risks.

On options, the paper considers the traditional conversion and renewal options available with term assurances, but goes into more detail on the newer type of guaranteed insurability options linked to the Retail Prices Index. Here, the design of the operation of the options is stressed as a means of controlling the claims costs.

The paper concludes by pointing out that care is needed in the construction of additional benefits and that it will be necessary to pay more attention to risk selection if a move towards protection develops. This is a reversal of earlier trends where the role of the underwriter has tended to diminish. It is stressed that any office introducing benefits or option arrangements of the type described must have clearly thought out underwriting and claims procedures before product launch.

SUMMARIES OF RESEARCH DISCUSSION PAPERS

(Copies of these papers may be borrowed from the Institute Library)

STEPS TOWARDS A COMPREHENSIVE STOCHASTIC INVESTMENT MODEL

BY A. D. WILKIE, M.A., F.F.A., F.I.A.

(Paper No. 36 deposited in the library in December 1984)

THIS note is an Appendix to the paper "A Stochastic Investment Model for Actuarial Use" by the same author, which was submitted to the Faculty on 19 November 1984.

Part I of the note describes the statistical investigations that led to the development of the stochastic investment model described in the Faculty paper. This is based on a study of the Retail Prices Index, and its predecessors, over the period from 1661 to 1982; indices of share dividends and share yields from 1919 to 1982; and the yields on Consols from 1756 to 1982. The resulting model takes as input four independent 'white noise' series, and transforms them into suitably correlated series that adequately describe the movements of these investment variables, so that the resulting model can be used for simulations of 'possible futures'.

Part II of the note gives details of the results from the model with various parameters and various starting values, to show the sensitivity of the results to changes in these parameters.

Finally a table showing a particular simulation is given, along with graphs of it and of other simulations.

ON A CLASS OF RESTRICTED PERMUTATIONS

BY DR JACQUES DUTKA, PH.D.

(Paper No. 37 deposited in the Library in April 1985)

THE paper treats the problem of "Circular Sealing Arrangements" (see D. S. Jones and P. G. Moore, *J.I.A.*, **108,** 405) as a particular case of a diverse family of problems of the same genesis. An explicit solution of the general problem is developed, and an historical sketch is provided of several related problems including the 'Genoese lottery', 'Tait's knot problem', the 'problème des ménages' and other variations.