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MATHEMATICIANS AND ACTUARIES

Mathematics In Actuarial Work, Special Issue, Bulletin, The Institute of Mathematics and its Applications, Volume 8. Number 1, January 1972. Single copies of this issue may be obtained for 75p from the Institute of Mathematics and its Applications, Maitland House, Warrior Square, Southend-on-Sea, Essex. SS1 2JY, England.

by James C. Hickman

Before reviewing the contents of this interesting journal, it might promote understanding if we said a word about the origin of the papers it contains. The Institute of Mathematics and its Applications is a British scientific organization with aims rather like those of the Society for Industrial and Applied Mathematics in North America. Besides the Bulletin the Institute publishes a research oriented Journal and sponsors a varied program of symposia and conferences. On October 26, 1971, the Institute of Mathematics and its Applications joined with the Institute of Actuaries in sponsoring a symposium on the topic, *Mathematics in Actuarial Work*. The conference was held in Staple Inn Hall, London, venerable home of the Institute of Actuaries. This issue of the Bulletin contains the four papers presented at the symposium.

If for no other reason, this issue of the Bulletin would be of interest because it defines the areas where four distinguished British actuaries believe that current thought in actuarial science intersects with more general applied mathematics. However, the value of this issue goes far beyond its role in mapping the interface between actuarial science and the rest of mathematics. The four papers provide excellent overviews of rather different topics and they should be of considerable value to practicing actuaries interested in being informed about activity on the frontier.

J. R. Gray, F.F.A., Professor of Actuarial Mathematics and Statistics, Heriot-Watt University, Edinburgh, contributes the introductory essay which builds a case for interaction between actuarial science and other areas in applied mathematics.

The first paper is *Mathematical Models in Portfolio Selection* by P. G. Moore, F.?, Professor Moore in eight packed pages reviews most of the important ideas developed in the past twenty years, since the publication of the pioneering work of Markowitz, on investment portfolio selection. North American actuaries

who are concerned either with measuring investment performance or with the management of a common stock account will find that Moore provides an excellent overview of current thinking. Many of the ideas that Moore explains have appeared in sessions of the Society of Actuaries during recent years. In Moore's paper these ideas are organized and critically evaluated.

The second paper, *Stochastic Processes Applied to Life Tables*, by Bernard Benjamin, F.I.A., returns to a more traditional actuarial topic. At first Benjamin reviews some basic ideas about constructing life tables from demographic statistics and interpreting the results. In the second section of his paper, Benjamin advances a suggestion, that seems to surface periodically, that the application of the continuous time Markov process might lead to insights in cause of death analysis. The final section of the paper deals with a problem that is important to biostatisticians when they evaluate alternative therapies for deadly illnesses and to life insurance underwriting officers when they fix selection standards. The problem is testing the hypothesis that two survival functions are the same. In developing this topic, Benjamin relies on an earlier paper by Armitage. Because of the mounting cost of large scale impairment studies and competitive pressure to insure lives with rare impairments, one is led to conjecture that the small sample methods of comparing survival functions reviewed by Benjamin may someday enter routine actuarial practice.

Reading the third paper, by Sidney Benjamin, F.I.A., A.S.A., will strike most actuarial readers as a return to familiar ground. The paper is entitled, *Model Offices* and starts with a fascinating historical review of the model office concept. The second section is directed toward helping non-actuarial readers understand the key issues in a model office type computation. In the third section the author articulates the massive difficulties involved in making a model office simultaneously realistic, manageable, and and informative.

The final paper, by R. E. Beard, F.I.A., A.S.A., is titled, *Non-Life Insurance* although it could equally well be called "Primer on Collective Risk Theory." Paragraphs 10, 11 and 12 have to do with the practical problems involved in estimating the parameters that define the

This brief pamphlet summarizes the important social security legislation that has been enacted since the start of the program in 1935. Like similar publications issued in the past it is intended to be a quick reference regarding the legislative history of the OASDHI system.

Free copies of this publication "DHEW No. (SSA) 73-11510" can be obtained from Office of Public Affairs, Social Security Administration, Baltimore, Maryland 21235.

LIBRARY

Long plagued by a shortage of space, the Library of the Insurance Society of New York, Inc., which houses and administers the Library of the Society of Actuaries, has finally realized its ambition of moving to larger quarters. The new mailing address is:

> The Librarian
> Insurance Society of New York, Inc.
> 123 William Street
> New York, New York 10038

The Library's telephone number remains the same: area code 212, WO 2-4111, library extension.

Rules and useful information about both libraries appear on pages 8 and 9 of the 1973 Year Book. Society of Actuaries' members are encouraged to avail themselves of the various services offered by the libraries.

collective risk model. The remaining forty paragraphs summarize the current state of risk theory in elegant fashion.

At least two of the four papers deal with topics recently covered at teaching sessions at Society of Actuaries meetings. The high quality of these four British papers suggests the benefits that might accrue to North American actuaries if the effort were expended to polish and then disseminate some of the new material presented at these teaching sessions.   □