SOCIETY OF ACTUARIES

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YALE CONFERENCE FOCUSES ON ADVANCED TECHNIQUES

by Edward A. Lew

The Committee on Research of the Society has been experimenting with various means of furthering graduate education of actuaries in mathematical and statistical techniques applicable to insurance problems. To this end, it co-sponsored an Actuarial Conference at Yale University, Nov. 30-Dec. 2, 1967. The other sponsors were the Yale Department of Statistics and the Committee on Mathematical Theory of Risk of the Casualty Actuarial Society.

This conference aimed at exploring common interests between actuarial science and other related disciplines. The attendance of 60 actuaries among the 80 participants is evidence that the subjects are of current interest to many members of the actuarial profession. The subjects treated were highly technical in nature and the following note is but a brief summary of the topics treated. It does not do justice to the spirited and pithy discussion which followed the presentation of the papers.

Dr. Paul Johansen, President of the Danish Actuarial Society, reviewed recent developments in the theory of risk as a highly sophisticated model for insurance operations. There are increasingly general assumptions which have significantly enlarged the range of application of this theory. He emphasized the advisability of a broader education for the actuary, such as might be fostered by learning a foreign language as well as a computer language.

Savage and Shubik Views

Professor Savage of Yale pointed out that the insurance business was essentially concerned with rational behavior in the face of uncertainty. He referred to the Bayesian approach as part of a theory of preference based on concepts of personal probability and utility, and indicated that many actuarial problems, such as graduation and credibility, could be explored more sensibly within this framework.

Professor Shubik, also of Yale, characterized game theory as a useful approach to strategic decision making. He pointed out that many real life situations are better described as non-zero sum games and suggested the possibility of solutions through negotiation when the players had common interests.

Simulation was defined as a technique for constructing models of complex organizations, and gaming as a procedure for predicting future states by simulating operations with open decision variables. The relationship between game theory and experimental gaming is discussed by Professor Shubik in his paper, "Some Experimental Non-Zero Sum Games with Lack of Information About the Rules" (*Management Science*, January 1962).

Kahn and Hamming

Paul M. Kahn discussed the development of credibility theory from the Bayesian viewpoint. He showed that for certain types of distributions the usual credibility formula can be regarded as providing the best linear approximation to the posterior premium, on the assumption of the Bayesian approach.

Richard W. Hamming of the Bell Telephone Laboratories, author of *Numerical Methods for Scientists and Engineers* (McGraw-Hill, 1960), stressed that the traditional content of numerical analysis has been changed radically by the advent of computers. In making computer calculations we need to be concerned with "round off noise," truncation errors, and related problems. Dr. Hamming covered much ground in his talk, with emphasis on insight into the nature of computer calculations rather than specific methods.

Anscombe and Seal

Professor Francis J. Anscombe, Chairman of the Statistics Department at Yale, pointed out that before computers, statistical theory relied heavily on linear unbiased estimates and linear regression with relatively few variables. With the aid of computers, it is now feasible to study non-linear relationships and many variables. Professor Anscombe described a new programming language—APL—being developed by IBM, which permits ready handling of arrays of numbers. This language will facilitate direct communication between the statistician and the computer, and virtually dispense with programmers.

Hilary Seal sketched an elegant derivation of the basic equations in risk theory, and showed how notions derived from queuing theory are identical with those in collective risk theory as developed by Scandinavian actuaries. He also mentioned possible use of simulation to calculate "ruin" probabilities.

A limited number of copies of the papers will be available at the office of the Society in April.

Another Actuarial Conference on the general subject of simulation will be held at Duke University, Oct. 31-Nov. 2. In due course, members will be informed of the details of this Conference. □

EDUCATION DISCUSSED AT ACTUARIAL CLUB

At its meeting on Jan. 11, the Baltimore Actuaries Club discussed the "Education of the Actuary" in the light of the reported discussion from the Chicago meeting. While the consensus of the Baltimore meeting was that the present educational and examination system produced satisfactory results, there were many critical comments on detailed aspects ranging from syllabus content and examination methods to recruiting.

Most of these comments were personal, reflecting the examination experiences or educational ideas of the speaker. There was general agreement that something should be done about the Canadian content of the syllabus, and Bert A. Winter's suggestion of removing finite differences from the syllabus seemed to meet with approval.

There was some comment about the multiple choice questions, one speaker suggesting that these were hardly applicable to Selection of Risks. Other topics included how far the Society should attempt to use the facilities of the academic world to meet its needs, and how far actuaries should be trained in statistics and statistical methods. □

ACTUARIAL CLUB MEETINGS

March 5, Canadian Institute of Actuaries, Toronto

March 6, Kansas City Actuaries Club, Kansas City, Missouri

March 14, Baltimore Actuaries Club

March 14, Junior Branch of the New York Actuaries Club