# The Actuary

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## DECISIONS UNDER UNCERTAINTY

*by E. A. Lew*

The fourth actuarial research conference, centering on the "Analysis of Decisions Under Uncertainty," was held in Boston Nov. 20-22, under the sponsorship of the Society's Committee on Research and the corresponding group in the Casualty Actuarial Society.

The field of inquiry for the conference combined a number of related topics such as decision theory, utility theory, subjective probabilities, and Bayesian inference, leading to a formal approach for making business decisions. There is little doubt in the minds of those who took part that this type of approach can be highly serviceable in tackling a variety of problems in life and casualty insurance.

The 92 persons who attended were fortunate to have the key notions in the "Analysis of Decisions Under Uncertainty" expounded by Professors Howard Raiffa and Robert Schlaifer of the Graduate School of Public Administration at Harvard. These two distinguished scholars have collaborated for a number of years to establish rigorous foundations for an analytical procedure to produce decisions consistent with a businessman's basic judgments and preferences. Professor Raiffa's book *Decision Analysis: Introductory Lectures on Choices Under Uncertainty*, published by Addison Wesley in 1968, was the sole prescribed reading for the conference.

During the first two sessions, Professors Raiffa and Schlaifer reviewed the subject in broad terms; their incisive comment on the construction of decision trees, assessment of preferences and probabilities, and evaluation of different strategies provided valuable insights for

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## TWENTY YEARS AFTER

*Editor's Note: At the Boston meeting (November 1969) the first 20 years of the Society's history were recognized by a dinner honoring the Past Presidents. E. J. Moorhead, now the President, to the delight of the audience if not to the discomfiture of the guests, briefly delineated the history of each President. E. M. McConney, who was the first President of the Society (and whose two Presidential addresses are well worth reading), replied on behalf of the guests. We are privileged and delighted to print his reply.*

*by E. M. McConney*

On behalf of the Past Presidents I thank you for your generous and witty remarks about us. It brought to mind the little girl who was strolling with her father through a cemetery and as she read the epitaphs said: "Daddy where are the bad ones?"

On an anniversary one is supposed to look backwards and then forward at the risk of a crick in the neck. I will be brief but not quite as brief as the Chinese poet who, on awakening, wrote an ode to his mistress in two words:

*Dawn*
*Gone.*

Almost 50 years ago I attended my first meeting of the old Actuarial Society at the Astor in New York. It would now seem very strange if we could show it on film. There was an "establishment," of course—Hunter, Henderson, Hutcheson, both Craigs, Rhodes—and they always sat in the front row—rather frightening for the speaker. Some things have not changed—the students complained that the examiners were groovy on graduation and the examiners complained that

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## THE GRADUATE

*by Julie C. Stenlund**

Guest speaker at the December, 1969, meeting of the Actuaries Club of Des Moines was James J. Chastain, Alumni Professor of Insurance, Drake University College of Business Administration. His address was titled "On the Care and Feeding of the College Graduate."

Professor Chastain began by proposing that college recruiting for the insurance as well as for other industries is a game people play, a collegiate "Let's Make a Deal." In meeting today's graduates, the college recruiter must present his case with particular emphasis on those aspects of the business world of primary concern to the graduate. He must anticipate the graduate's demands and be prepared to meet them.

When the recruiter has been successful in selling his "product," and his company has the new graduate firmly in tow, the second stage of the game begins. Now, the employer must chart a course for the graduate that will be simultaneously stimulating, interesting, and challenging, or run the risk of losing him to another employer promising all this and more.

Professor Chastain immediately involved his listeners by some "audience participation." He distributed copies of two lists of phrases entitled: "The College Graduate:" "How to Turn Him On" and "How to Turn Him off." These phrases had been prepared by a researcher and college professor closely connected with the phenomena of college recruiting, and they reflect the views of recruiters from many industries as well as those of present students and recent graduates.

**Miss Stenlund is a Student of the Society.*

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## Twenty Years After

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the students did not dig the essentials Some things seem to come round in cycles—the Treasurer had long hair almost to his shoulders in a Quaker haircut. There were a few beards—evidently in every generation some girls enjoy hunting through underbrush for a kiss.

Twenty years ago our Society grew out of a merger of the two old actuarial bodies. The story of the merger is told in Reinie Hohaus' paper and at this meeting Vic Henningsen has given a fine review of the first 20 years. As we look back to the merger it seems strange to us now that there was opposition to the merger. Some actuaries in the East were unhappy about admitting some older members of the western Institute who had acquired their actuarial knowledge the hard way by trial and error rather than by examinations. And some actuaries in the West had the fear, so engrained in their banker friends, of domination by the actuaries in the East. Few remember the fear of Wall Street in those times. The objections were overcome, however, at the joint meeting at French Lick Springs, noted for its waters good for many complaints. There were no demonstrators with placards; and any sit-ins occurred elsewhere.

One more look backwards. About 40 years ago at my first international meeting, I chatted with the son of a notable British actuary and found that this young man had just passed his finals at Oxford with a "Greats" in History and was being articled to a solicitor. Translating into American: he had just graduated with a *summa cum laude* in the history of past civilizations and was starting in a law office where he would work by day and study at night for the law examinations;a procedure quite familiar to budding actuaries and patient wives. For them I have a quotation from an Old Greek poet:

*Before the gates of the road to excellence, the high gods have placed—Sweat.*

Now let us look forward. We see two amazing emerging forces. One a powerful communications and computer technology, which enables us to transmit any type of intelligence over any distance and to process and recall it in any desired form.

The other is a rapidly rising inventory of data about every conceivable subject from Astrophysics to Zappa's Rubin and the Jets.

Together these two *can* lead to a profound cultural change and a vast expansion of knowledge in the management of social, economic and political affairs of the whole world.

But *will* they?

The answer depends on actuaries and other scientists who have the ability and knowledge to control these technical forces and who, like that young man I mentioned, have a "Greats" in knowledge of the *past* . . . of those empires that wrested vast territories from barbarism, built their Seven Wonders of their world, and who, when they became too affluent to meet a challenge, too indifferent to needs of their citizens and too tolerant of social decay, vanished, leaving little among their middens and shards except examples of failure.

Santayana has well said: "A nation that does not know history is fated to repeat it."

From one little city-state of all the past we have received a priceless gift—a *civilization of the mind*—a knowledge of democracy—a great desire for freedom with responsibility — and a philosophy for living. With this and the technical knowledge and history of the past, the answer to my question can be affirmative.

And so—to you and the generations to come who will decide the future I give, in Boston where there is still a Latin school, the old Roman greeting:

*Ave atque Vale!*
*Hail and Farewell!* □

## RISK AND RUIN

Hilary L. Seal, *Stochastic Theory of a Risk Business*, pp. 10, John Wiley & Sons, Inc., 1969, $14.95.

*by Paul M. Kahn*

Dr. Hilary Seal is both a consulting actuary and a lecturer in biology and statistics at Yale. In his latest book, *Stochastic Theory of a Risk Business,* he presents a comprehensive survey of the literature on the mathematical foundations of risk taking as a business. Interest in risk theory has been growing in the United States, and this text should prove a stimulus to its further development and application.

Dr. Seal defines a risk business as one with a risk reserve, premium income and claim payments; the principal example is an insurance business. He weaves together over 250 articles and books into a systematic study of the mathematical theory of an insurance enterprise from the point of view of the modern theory of stochastic or random processes.

A chapter each is devoted to finding the distribution of aggregate claims, net premium calculations, and reinsurance. The heart of the book is a mathematically sophisticated discussion of the probability of exhausting a risk reserve, often referred to, unfortunately, as the ruin problem. In the final chapter he describes the place of utility theory in analyzing the risk process.

This learned and complete study puts into focus over a half century of actuarial research. While the book demands of the reader an extensive mathematical equipment, nevertheless any actuary seriously interested in the subject will find it worth while. □

## SOCIAL SECURITY 1969 AMENDMENTS

(1) All benefits of beneficiaries on the roll were increased by 15%. New benefit formula is 81.83% of the first $110 of average monthly wage, plus 29.76% of the next $290, plus 27.81% of the next $150, plus 32.69% of the next $100, increased slightly for average wages under $94 and with a minimum primary benefit of $64.

(2) The $105 maximum on wife's benefits was eliminated.

(3) The allocation to the DI Trust Fund from the combined OASDI contribution rate was increased from .95% to 1.10% for the combined employer-employee rate and from .7125% to .825% for the self-employed rate.

The "Summary of the Provisions of the Old-Age, Survivors, and Disability Insurance System, the Hospital Insurance System, and the Supplementary Medical Insurance System" has been revised to take into account these amendments and is available without charge upon request to Robert J. Myers, Chief Actuary, Social Security Administration, Washington, D.C. 20201. □