



SOCIETY OF ACTUARIES

Article from:

# The Actuary

June 1969 – volume 3 - Issue 6



# The Actuary

The Newsletter of the Society of Actuaries

VOLUME 3, No. 6

JUNE, 1969

## CREATIVITY RESEARCH ON ACTUARIES

by Dean C. Dauw

*Editor's Note: We are greatly indebted to Dr. Dauw and to the Journal of Creative Behavior for permission to publish this summary of Dr. Dauw's report which appeared in the Journal. Dr. Dauw is a consulting psychologist and is currently an associate professor at De Paul University's College of Commerce. He was recently Director of Personnel Research for the CNA Financial Corporation. Copies of the complete report may be obtained on request from Dr. Dauw at the Human Resource Development, Inc., 520 No. Michigan, Suite 520, Chicago Ill. 60611.*

An actuary is a person who applies the theory of probability and statistics and the principles of finance to the problems of insurance, pensions, social security, vital statistics, and related fields. In the field of insurance, the actuary works with the probabilities of events such as death, sickness, disability, retirement, unemployment, property destruction and so forth. He must combine these probabilities with the principles of finance and administration to determine premiums, reserves and other financial particulars which provide the basis for the sound and efficient operation of the company and the protection of the policyholder.

Since most authorities agree that one may be judged creative if he can invent original and useful processes or devices, the subject of creativity in actuaries is of interest to insurance executives. They have shown increasing interest, for example, in research which has shown how creativity tests can isolate the personalities necessary to invent useful processes or original devices—that is, to identify those persons who can be expected to meet unusual events that

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## SOCIAL SECURITY

We are glad to learn from the Department of Health, Education and Welfare that Charles A. Siegfried has been appointed to the Advisory Council on Social Security. This Council is appointed every four years in accordance with the terms of the Social Security Act. The Council will report to the Congress no later than Jan. 1, 1971 on all aspects of the Social Security program.

Robert J. Myers, *Comparison of Actual Experience under HI with Estimates of Various Organizations*, Actuarial Note No. 50, pp. 3, Social Security Administration, Washington.

This note compares actual experience under the Medicare program for the first full year of operation with the cost estimates that were made early in 1965 by the Social Security Administration (SSA), the Blue Cross Association (BCA), the insurance industry, and, to a lesser extent, the American Hospital Association (AHA). The note concludes that the estimates prepared by the BCA and the insurance industry were relatively close to the actual experience, more so than the ones prepared by the SSA. The principal weakness in the SSA estimates is considered to be the low utilization rates that were used for both in-patient hospital and extended care facilities benefits, the difficulty arising primarily because of placing too much dependence on data obtained from surveys of Old-Age, Survivors, and Disability Insurance beneficiaries.

Robert J. Myers and William D. Ritchie, *Mortality of the Aged before and after Medicare*, Actuarial Note No. 51, pp. 2, Social Security Administration, Washington.

This note analyzes the annual death rates of the United States population aged 65 and over for fiscal years 1961-68. The note concludes that the trend in these death rates does not, as yet, reflect any

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## MORE ABOUT THE "PRICE" THEORY

by Joseph M. Belth

*Editor's Note: Dr. Belth is Professor of Insurance in the Graduate School of Business at Indiana University. We are glad to welcome him as a contributor.*

Mr. William Gould's article (*The Actuary*, March 1969) reports in some detail on his analysis of the level-price method. Although he shows an understanding of the mechanics of the method by performing the calculations, some of his references to my work suggest a lack of understanding of some of the subtleties of the method. The purpose of this article is to discuss those aspects that appear in need of clarification.

Mr. Gould's example involved the sixth year's price per \$1,000 of protection for two policies, each of which was a ten-year endowment issued at age 50. Both policies had the same premium: Policy A had cash values equal to net level reserves, Policy B had cash values that were "somewhat less," and the cash value *increase* in the sixth year was the same for the two policies. He concluded from his analysis that there is a "major defect" in the level-price method, in that "the formulae do not take proper account of significant differences in the savings elements of the two policies."

Apparently Mr. Gould missed an important point. The circumstances under which the yearly prices per \$1,000 of protection will duplicate or approximate the tabular mortality rates are described on pages 83-85 of my book, *The Retail Price Structure in American Life Insurance*. One of the necessary conditions is the use of cash values that are equal to net level reserves. Cash values that are "somewhat less" should not be expected to produce yearly prices per \$1,000 of

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## Letters

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Year-end based on demand liabilities and asset valuation at market. The states would then be able to analyze company surplus both on a "going concern" basis and on a "termination" basis.

To accomplish this, the Blank should include a summary of cash values as of the next premium due date on each policy and a summary of unearned net premiums for the period from 12-31 to such due date.

"Termination assets" would be defined as present statutory assets plus the algebraic excess of market over book, plus furniture and equipment items now non-admitted less deferred and due and unpaid premiums.

"Termination liabilities" would be defined as present statutory liabilities less the excess of reserves over cash values plus the net unearned premiums less all security valuation reserves.

The balance, of course, would be "termination surplus" and the increase each year would be "termination earnings" and would serve the same purposes as adjusted earnings.

Richard S. Hester, Sr.

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## The Past Is Prologue

Sir:

Ray Peterson recently tactfully suggested that actuaries should be interested in Social Security. For several years I have intended to submit to the *Saturday Evening Post* a discussion for the "Speaking Out" page. Inspired by Ray's alliterative precedent, it was to be captioned *Social Security—Sampling Its Seamy Side*. When I tried out the idea on a venerated professor, he quipped: "Is there any other side?" But I waited too long.

So, as a caption to this shorter "sampling" for fellow actuaries, I have chosen *The Past is Prologue*.

When I got to Washington in October, 1934, as one of two Fellows of the Actuarial Society of America, the other one, Otto Richter of AT&T, had beat me there by a few days. Dr. Witte, Director of the staff assembled to service the Cabinet Committee on Economic Security, calmly informed me that the President wanted the Report of the Cabinet

## Papers Invited

The Actuarial Society of Belgium (Association Royale des Actuaire Belges) advises us that they will be celebrating their 75th anniversary in 1970. They are inviting papers on the following subjects:

- Determination of the heterogeneity of the classes of risks.
- Application of optimization techniques to actuarial and commercial problems.

A prize of \$500 will be awarded for the best paper on each subject.

Any member interested should get in touch with Charles B. H. Watson, the Executive Director of the Society.

Committee before Thanksgiving and that Otto had been assigned the Old Age Benefits part, and I would handle Unemployment Compensation. I did get home for Christmas!

Rather early in 1935, I was sounded out about "running down to Washington" to explain actuarial matters to the House Committee on Ways and Means. The official request came from Congressman Treadway of Massachusetts. Taking the sleeper, I arrived in Washington early in the morning. I got in touch with Dr. Witte, to say "I assume you had me sent for." "Not at all," he replied. "You are demanded by the opposition. But you will have to be instructed on the drastic changes made in 'the Morgenthau Amendment' on Old Age Benefits."

I may have had all of two hours to learn about the changes—especially to become acquainted with a neat schedule, showing year by year from 1937 through 1980, the plausible expected outlay and income of Old Age Benefits, and the progress of what was later called "The Trust Fund," but was then designated "The Reserve." At the end of 1980 the Reserve was to be \$47 billion—a figure that alarmed the life insurance business. The income included taxes and interest, the outlay benefits and administrative costs. The 1939 Amendments changed the name from Old Age Benefits to Old Age and Survivors Insurance.

I probably called attention to "a sneaking-in suggestion" then designated "pay-as-you-go"—meaning, as Dr. Witte said "owe-as-you-go"—for I remember

my embarrassment when a Congressman said he "liked the sound of pay-as-you-go."

Over the more than three decades of operation, with expansion of coverage, change of "the bent formula" from time to time, it is instructive in "studying the past" to note a few relationships of "actual to expected" — the "expected" based on the Schedule furnished the Congress with my hastily acquired rationalizations.

For the one year 1968 the taxes taken in are ten times those projected in the 1935 Schedule. The benefits are ten times the "expected," too. The share of interest was to have been 53% of the taxes for 1968. The share was 4% of the taxes.

From 1937 to 1968 the benefits paid out zoomed from a million dollars to over twenty billion, a 20,000-fold growth in 31 years. Each year of the first four of operation, the average individual's tax payment was \$9. In 1968 it must have been at least ten times that. Usually the semi-informed critics only state the maximum payment, and I have seen no helpful average in recognition of the "hunger of the poor" and the large lag in moving up the average. The individual benefits now being paid, including a large number of virtually "free ones," give way but slowly to the cautious periodic increases, and the "soak-the-rich" concept, as in the progressive national income tax, in that "bent formula."

As today's astronomic incomes get recognized in the benefits off there in the "owe-as-you-go future," the mythical taxi driver's translation of the National Archives pedestal motto, *The Past is Prologue*, seems a suitable summary—"You ain't seen nuthin' yet."

W. Rulon Williamson

## Social Security

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significant improvement in the mortality of the aged since the advent of Medicare, July 1, 1966. Also, it is stated that future analysis—when more experience becomes available—is necessary.

Copies of these notes may be obtained gratis from Robert J. Myers, Chief Actuary, Social Security Administration, Washington, D. C. 20201. □