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THE ORIGIN OF IMMUNISATION

by Frank M. Redington, F.I.A.

Ed. Note: The author is one of only eight winners of the Institute of Actuaries' Gold Medal for actuarial work of pre-eminent importance. In that 1968 award, the paper described here was cited as having "opened up an epoch in which new and more realistic principles were to be applied to the financial planning of insurance institutions." Mr. Redington was the Institute's President, 1958-60.

I have many pleasant memories of meetings with actuarial colleagues from North America. Unfortunately these contacts have become all too infrequent since my retirement in 1968. It was therefore a great surprise to learn that the idea of immunisation is flourishing in North America. From the little I have read of your proceedings I think that some reminiscences of the origin of immunisation may interest readers of *The Actuary*.

In 1951 the sessional meetings committee of the Institute of Actuaries asked me to write the paper on life office valuations for delivery in Spring 1952 that now appears in *J.I.A.* 78 (1952), p. 286. Although the paper was, in this sense, commandeered it was a task which I undertook with enthusiasm because valuation was both my job and my hobby. Although I am an inveterate re-polisher the task was completed to my satisfaction some fortnight before the date for delivery to the scrutineers. At that stage the paper was in its final form except that instead of the passages on immunisation in the earlier part of the paper, there was a conventional passage on the necessity of matching assets with liabilities on such matters as currency, degree of risk and spread over time. I have no doubt that this passage was as plausible

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ALFRED BAKER: PIONEER IN TEACHING ACTUARIAL SCIENCE

by Peter L. J. Ryall

In the spring of 1885, actuarial concepts and symbolism made their appearance in three of nine questions in an examination paper on Theory of Probability at the University of Toronto. Credit for what may well have been the first actuarial instruction at a university goes to Alfred Baker (1848-1942). Possessor of a keen and diverse interest in education, his accomplishments included reorganizing Canadian teaching of geometry and introducing Spanish into high schools. His talents were recognized both within and beyond the University; he became Dean of the Faculty of Arts (1912-19) and President of the Royal Society of Canada (1915-16).

Professor Baker never forgot or regretted his attachment to actuarial education. On his retirement in 1919, he nicely balanced the utilitarian with the cerebral appeal:

"I have in my 33 years as Professor of Mathematics tried to feature the practical value of mathematical training as applied to actuarial, engineering, chemistry and the like work, but the singular intellectual beauty of an absorbing mathematical problem has, like art, but aesthetic value for its vindication."

After Professor Baker's death at age 94, his biographer, Professor S. Beatty, left us many happy sidelights on him and his interests, such as:

"In his own study and in his lectures, he made full use of intuition, and it was always easy to follow the natural course of his exposition . . . He was a lover of nature and a student of history and the classics . . . In mathematics, his main interest was geometry, . . . and he was

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THE E. & E. CORNER

We want more of your queries. Please send them to James J. Murphy at his Yearbook address.

Ques.: What is the scoring method on essay examinations?

Ans.: Each examination committee has a grading process to fit its own needs. Most are structured along the following general lines:

The essay answers go directly to a committee officer where they are sorted by question number and mailed to committee members, each of them assigned to a single question.

Each grader starts with a grading outline which lists possible points and sub-points, their numerical values set according to each item's importance. The grader may give additional credit in recognition of a candidate's demonstrated overall grasp and understanding of the subject.

In grading the first few papers, frequently the grader will see that the outline doesn't contain points that deserve credit. The grader then will revise the outline and start over. Even then, credits for points still missing from the outline may be given.

After all papers have been graded, a conversion scale is developed to assign the score each candidate is to receive for that question. Generally, the best papers will receive the maximum score, i.e., the score printed on the question sheet.

Essay scores are next combined with multiple-choice scores, if any, and candidates ranked in score order. Approximately the middle 50% will have their essay papers regraded at a central grading session which all committee members attend. The top 25% and the bottom 25% will generally not be regraded, as it is assumed that those scores

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COMPETITION NOTE

The message that penetrates here to Milwaukee is that some would-be solvers of Graham Deas' ACTUCROSSWORDS get discouraged if they fail to unravel every last one of the clues. Perhaps it's worth emphasizing that each clue is a puzzle in itself; even the most expert don't just fill in the answers.

In response to a remark that solvers are beset with doubts even after seeing the answers, Mr. Deas has commented:

"That sort of thing often happens.

With the famous London Times' crosswords I sometimes find myself in the same position. So do many more eminent solvers. Nobody knows all the answers all the time. A puzzle may, however, be rated as fair if others produce the answers."

So, to encourage patience and fortitude, we will take a leaf from *Harpers Magazine*, which has a monthly puzzle quite similar to our ACTUCROSSWORDS. Just send your completed puzzles to the Competition Editor at his Yearbook address. The first three correct solutions will receive a free one-year subscription to *The Actuary*. Any winner already receiving this newsletter "free" may designate a worthy student or other non-member to receive his prize. Senders of all correct solutions will be recognized in this newsletter.

C.G.G.

E. & E. Corner

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could not change enough to move them from pass to fail or vice versa. At this central grading, each paper is independently graded by a committee member who did not grade it originally, but using the same grading outline. If that second grader's score on a question varies from the first grader's score by more than an allowed tolerance, the first grader regrades the paper; the two graders may discuss the paper and settle upon a score.

After central grading, candidates are again ranked in score order. When a pass mark has been agreed upon between the examination committee and the general officers of the E. & E. Committee, papers near the pass mark are reviewed, sometimes in their entirety, to make sure each has been fairly treated throughout the grading process. □

ACTUARIES MUST CONFRONT THE "C-3" RISK

by Carl R. Ohman

Ed. Note: In today's jargon, C-3 denotes the risk, to the life company, of loss from interest rate changes (C-1 and C-2 being the corresponding risks from asset depreciation and from pricing deficiencies). Mr. Ohman's discussion at our 1981 Annual Meeting, excerpted here, will appear in the Record, Vol. 7, No. 4.

In bygone eras of stable interest rates, actuaries might reasonably presume that compliance with the Standard Valuation Laws in the U.S.A. assures making good and sufficient provision for a life company's unmatured obligations. This presumption is no longer valid, except perhaps in a company blessed with reasonable matching of assets and liabilities, reasonable underwriting safeguards in its liabilities, and reasonable call protection in its assets.

This places squarely on the shoulders of the actuary who signs the Actuarial Opinion for the annual statement the burden of judging whether the reserves, even though in compliance with statutory minimums, really are adequate to fund the company's obligations. To arrive at such a judgment the actuary will need to make specific projections of liabilities, and of supporting investments, under various possible paths of future interest rates (rising and falling), with asset repayment assumptions and policyholder withdrawal assumptions linked to these interest rate movements. This challenge is already being recognized among actuaries responsible for valuing group annuity interest guarantees, and it is likely that at least one state (New York) will soon require an actuarial memorandum describing such tests.

The assignment of the C-3 Risk Task Force (of which Mr. Ohman is Chairman—Ed.) is to develop techniques for measuring adequacy of reserves against C-3 risk under various forms—guaranteed interest contracts, traditional whole life insurance (both non-par and par), universal life, and deferred annuities. These are well along and will serve as a basis for discussion and debate and for further research.

Opportunities for discussion will be given at each of the Society's 1982 meetings, and doubtless at many actuarial clubs and similar gatherings. □

ONE-SIXTH OF OUR MEMBERS ATTENDED SEMINARS IN 1981

By Linden N. Cole,
Director of Education

Why have our seminars become so popular? They attracted 1,304 actuaries last year. The answer, we believe, lies in the needs they fill: young actuaries broadening their horizons and becoming more valuable to their employers—experienced ones getting away from the office for a day or two to concentrate on a current subject or to absorb a mind-stretcher.

Seminars in Spring 1982

A brochure distributed last month lists ten seminars for March-June 1982. Three of these warrant special mention here because of unusual combinations of faculty and topic.

Two of these—on "Modern Investment Portfolio Theory and Immunization" and "Actuarial Uses of Economics"—will be taught by experts from other professions. The first reflects a trend for actuaries to become more involved in asset management; its faculty will be two New York University professors, both with life company consulting experience. Two economists and an actuary will lead the economics seminar, opening up economic data for actuaries' use in pricing, valuing and monitoring financial security programs.

The seminar, "Statistical Techniques of Forecasting," will provide participants with several computer terminals, a Society first. The two 1981 winners of the Halmstad Prize (reported in this newsletter's December 1981 issue) will be part of its faculty.

Suggestions for seminar topics will be welcomed if sent to Frank S. Irish, General Chairman of our Continuing Education Committee, or to Linden N. Cole. □