The Actuary
The Newsletter of the Society of Actuaries
VOLUME 15, No. 5 MAY, 1981

MY GREAT-GRANDFATHER THE ACTUARY

by Daniel F. Case

The flurry of accounts of three-generation actuarial families having waned pro tem, perhaps I may spark new genealogical interest by reporting the actuarial spanning of four generations.

Charlton T. Lewis (1834-1904), my mother's grandfather, became a Fellow of the Actuarial Society of America in October 1889, six months after its formation. No actuarial proclivities showed up in the next two generations, so fifty-nine years were to pass between his death and the arrival on our family scene of the next Fellowship.

My great-grandfather's qualification for membership seems to have been two-fold: the right background—he was a mathematics professor at age 22—and his role in 1871 as organizer and then secretary of the Chamber of Life Insurance. That organization of life companies, though destined to last only seven years, was described in Lewis's obituary as in a sense the forerunner of the Actuarial Society (because of its fact-gathering efforts); it was equally a precursor of the American Council of Life Insurance.

Lewis had two papers in our old *Transactions*, both on trends in interest rates. Testimony to his forecasting success can be found in a 1919 discussion of inflation and interest rates (R.A.I.A. VIII):

> "You will perhaps recall that just about twenty years ago one of the large life insurance companies published letters from distinguished financiers on the future course of the interest rate. Those letters were almost unanimous . . . in predicting

(*Continued on page 3*)

THE E. & E. CORNER

(*Ed. Note: Please send your questions for future response to James J. Murphy at his Year Book address*).

Ques.: How is the passing grade determined? Is the resulting proportion of successful candidates a factor? How is the minimum score (grade zero) arrived at?

Ans.: The minimum passing score is determined by considering: quality and difficulty of the examination compared to prior years; the passing scores of those prior exams; a review of scores near the tentative pass mark to see if there's an empty space that would clearly separate "pass" from "fail". A grade "0" signals any score less than 50% of the minimum passing score.

Ques.: How are multiple-choice questions graded?

Ans.: A correct answer receives 1 point, a wrong answer no points, an omitted answer 1/5th of a point. Any question discovered to be defective is thrown out, leaving scores and rankings as they would have been if the defective question hadn't been asked.

Ques.: In the multiple-choice exams, does anybody read the written solutions that the candidate sends in along with the answer sheet? Is any credit given?

Ans.: No. Only the answer sheet determines the score. No partial credit is granted even if the booklet shows a partially worked or correct solution.

J.J.M.

REASON BY NUMBERS

Nearly, not quite, all readers' requests for P. G. Moore's book (reviewed last October) have been filled by bulk order from London. And actuarial friends over there are sending us another (third) shipment. *E.J.M.*

CANADIANS CONSIDERING ECONOMIC FORECASTING

by Chris D. Chapman

The Committee on Economic Statistics of the Canadian Institute of Actuaries has recommended that the Institute sponsor an Economic Forecasting "Board" composed of actuaries and economists. Its role would be to develop formal projections of interest rates, inflation rates, productivity and wages. These would be "pure" projections (i.e., with no built-in margins or intentional bias), to serve as reference points for assessing the reasonableness of existing or proposed assumptions used by Institute committees, by regulators or by the courts.

Why This Comes Up

More and more, questions that arise between actuaries and public bodies such as provincial pension commissions, courts of law, company auditors, insurance departments and the Department of National Revenue, hinge upon views about the economic outlook. In the absence of any authoritative, well researched source of long-term forecasts or officially sanctioned actuarial guidelines, such bodies have shown increasing inclination to employ their own favored economic factors. Each public unit tends to promote its own version, and practicing actuaries have been plagued by differences between these assumptions. Also, the Institute's Guiding Principles call for internally developed technical support to assist the Canadian actuarial profession to discharge its responsibilities.

Now Or Never?

At the Institute's meeting on March 10th, members had the opportunity, which they readily grasped, to debate

(*Continued on page 3*)

The Actuary

Editor . . . . . E. J. MOORHEAD
Associate Editors . . MICHAEL B. MCGUINNESS, FREDERIC SELTZER
Competition Editor . . CHARLES G. GROESCHELL
Editor Emeritus . . . ANDREW C. WEBSTER

Correspondence should be addressed:
The Actuary
Bermuda Run, Box 780
Advance, N.C. 27006
Tel: (919) 998-5335

Published monthly (except July and August) by the SOCIETY OF ACTUARIES, 208 S. LaSalle St., Chicago, Illinois, 60604, Robin B. Leckie, President, Kenneth T. Clark, Secretary, Robert J. Johansen, Treasurer, Robert E. Hunstad, Director of Publications. Non-member subscriptions: students, $4.50; others, $5.50.

EDITORIAL

THE POST OF U.S. GOVERNMENT ACTUARY

A Guest Editorial by Dwight K. Bartlett, III

IN 1979 I was a catalyst in assembling an informal group—Chief Actuaries in Federal Service Coordinating Group—to discuss the question raised in the March Editorial, i.e., the desirability of creating a position of Government Actuary at a high level in the Federal Government. There are now about fifteen Federal agencies or departments that employ actuaries.

In these discussions we used as models the Government Actuary's Department in the United Kingdom and the Office of the Chief Actuary, Department of Insurance, in Canada. Each of those has, we understand, relatively independent status and provides virtually all the needed actuarial services at the national level.

We identified two principal hindrances to emulating them in the United States. First, ours is a tripartite form of government with separation of powers, not a parliamentary system like theirs. Both our Executive Branch and Legislative Branch require actuarial services, but on some questions the two may well have adversary positions. Can an Office of the Government Actuary structurally located in one branch make itself useful to both branches, and be accepted by both?

The second difficulty is that the actuarial services required by the departments and agencies in our Federal system seem considerably more diverse than in those countries.

Hence an Office of the Government Actuary here would have to develop its own pattern and it could not replace the existing offices in the various Federal agencies. The role of the Government Actuary would be to speak for the actuarial viewpoint on general questions, to audit actuarial work done in the individual agencies, to help those offices maintain their independence in the face of political pressures, to help make sure that actuarial analysis is given to governmental questions that require it, and to exercise general oversight.

Although the history of political undertakings by our profession does not justify confidence about what can be accomplished, I consider it well worthwhile for us to decide whether we wish to give active support to establishing an Office of the Government Actuary. But to convince policymakers in the Federal Government that such a post is desirable would not be easy, specially in the apparently complete absence of any present interest by non-actuaries in such a project.

DOG INSURANCE IN NORWAY

Ed. Note: We are indebted for this account from Oslo. Swedish experience with this coverage was reported by Carroll E. Nelson in our November 1980 issue.

Sir:

Life and invalidity insurance for dogs was introduced in Norway in 1961. Today, about 10% of our quarter-million dogs are insured. This unimpressive market coverage must show our failure to make this protection known; dog insurance is easy to sell. One's impression is that a client finds it more important to take out life insurance for his dog than for his wife.

The premium per unit of coverage is 7% + 10%, for respectively death and permanent invalidity (including treatment expense of sick and injured dogs). This is for coverage up to maximum age 10 years, subject to health certification at time of application. The loss ratio runs between 75% and 85%.

Sufficiently differing death and invalidity norms have been observed for different races of dogs so that some day we must either differentiate premiums by race or make exceptions for weaknesses peculiar to certain races. Further, we have established that certain characteristics present in specific races have become so finely bred that this goes at the expense of the natural, true anatomy.

Lars Austin, Actuary
Gjensidige
Norsk Skadeforsikring, Oslo

Sir:

May I suggest coverage on cats, even though it would be cat-astrophic if confused with catastrophe insurance. Non-purr policies could guarantee a happy cat; defurred benefits could assure warm coverage restored. Premiums might be replaced on the billings by a fee-line.

Increased actuarial employment would arise from complex new products based on 9 lives per healthy insured. Substandard policies acknowledging, say, only 7, or 5, or 1 life remaining could be offered.

C. Graeme Cameron

* * * *

Deaths

Norman M. Hughes, F.S.A. 1926
Charles E. Clarke, A.S.A. 1965

My Great-Grandfather

(*Continued from page* 1)

further decline in the interest rate, as it had been declining for some thirty years. . . . The one man who stood out against that view was Mr. Charlton T. Lewis, in his very scholarly paper . . . (1899). . . . You know the facts are that Mr. Lewis was right."

At an 1897 Society meeting, Lewis contributed the following views on nonforfeiture values:

"Inasmuch as the very suggestion of a surrender charge involves a reference to a reserve, as if the owner of the policy had some peculiar claim upon that reserve, so-called, as a separate and independent fund, I protest against the use of the term 'surrender charge'."

That view seems in tune with much later efforts — which may resume — to sever the traditional link between statutory nonforfeiture values and reserves.

Lewis was active in a myriad of non-actuarial fields. In addition to being a mathematics professor he taught the classics. At various times he was a Methodist minister, U.S. Deputy Commissioner of Internal Revenue (before income tax days), a practicing lawyer, managing editor of the New York *Evening Post*, and for twenty years Counsel of Mutual Life of New York. He was said to have delivered the most effective speech at the Gold Democratic Convention of 1896. And he co-authored Harper's Latin Dictionary, a 2,000-page standard reference.

His death notices (except the one in *T.A.S.A.* VIII) did not even mention that Charlton T. Lewis was an actuary. Our profession's profile was indeed low in 1904.

Ed. Note: In 1853, H. W. Porter, *F.I.A., remarked*(*J.I.A.* 4, 109) : *"A perfect actuary should be a kind of 'admirable Crichton'." Mr. Case's ancestor was of that breed.* □

"INDEXING LONG-TERM FINANCIAL CONTRACTS"

The above is the title of an extraordinary, and surely controversial, paper by A. D. Wilkie, F.F.A., F.I.A., read to the Institute on March 23, 1981. Quoting from its introduction:

> This paper has two functions: first, to present briefly the results of some recent investigations into the behaviour of a price index (in the United Kingdom) in order to gain some insight into the possible future progress of inflation; secondly, to present the arguments in favour of the linking to a price index of financial instruments, in particular government stocks, life assurance contracts and pension fund benefits . . . I am convinced that widespread index-linking of *long-term* contracts would have a beneficial effect on the conduct of our financial affairs. It is up to those who disagree with me to put their case in the discussion; but I hope my supporters will express their views too.

A striking feature of this paper is its charting of the U.K. price index all the way from 1661 to 1980.

E.J.M.

Economic Forecasting

(*Continued from page* 1)

the wisdom of, and procedure for, entry into the slippery field of Institute-sponsored forecasts. Among questions discussed were:

> Since all forecasts will inevitably be wrong, would their publication adversely affect the Institute's credibility?
>
> Would such forecasts tend to become legislated or to be seen as professional standards, thereby unnecessarily restricting the actuary's professional freedom?
>
> What alternatives are available to the CIA in fulfilling its mandate to provide technical support to its members?

The discussion proved distinctly helpful. The spectrum of choices open to the Institute is broad; so is the diversity of opinion amongst Canadian actuaries on what should be done. The resolution of this matter will be one of the more interesting challenges facing the CIA Council in 1981. □

AN ACTUARIALLY STAFFED CONSUMER GROUP

by James H. Hunt

Actuarial expressions won't be Greek to the National Insurance Consumer Organization (NICO), a new non-profit organization. Its President is J. Robert Hunter, FCAS; I am a Director, as also is Howard B. Clark, Esq., a former South Carolina Insurance Commissioner. A consideration in forming NICO is the lack of adequate insurance expertise within the consumer movement.

Public comments have already been made by NICO on several life and health insurance issues of concern to Society members, viz.

- *Life Insurance Cost Disclosure*: We called the NAIC Model confusing and misleading, made technical comments on and expressed reservations about the NAIC Task Force's recent proposal, and supported rate-of-return disclosure.

- *Replacements*: We said that unrestrained replacement of participating cash-value policies is causing substantial public harm, that companies have done too little to conserve old business, and that a suitability test, like that of the SEC for variable life policies, should be placed on replacing companies. We characterized the NAIC Model Replacement Regulation as worse than nothing.

- *Deposit Term*: We called the design of these policies an "actuarial trick" because their implied rates of return (7% to 10%) aren't matched by performance, and because they are being used in wholesale replacement, usually to policyholders' disadvantage.

- *"Project Update"*: We have urged insurance commissioners to demand that companies emulate Northwestern Mutual Life (see *The Actuary*, June 1980) in improving their old policies. We have said that failures of non-par companies to improve theirs constitute a cruel judgment that it is more profitable to rely on policyholder ignorance.

- *Credit Life Insurance*: We said that profit margins have increased faster than states have been reducing permitted rates. We filed objection to the Federal Reserve Board's proposed loosening of disclosures. We have a major report due in March on the implications of the

(*Continued on page* 4)

COMPUTER APPRECIATION COURSE

News from London is that the Institute's Students' Society, in partnership with Hewlett-Packard Ltd., has arranged a two-day course "to assist in bridging the gap between the range of modern computing equipment and software on the one hand, and the tasks and problems faced by the actuary in running his office on the other."

The course booklet (available on request to this newsletter) contains an editorial by the actuarial organizer, Gary F. Chamberlin, saying in part:

> There can be no doubt that this is a stimulating period to be working as an actuary or actuarial student in any Office which has begun to respond wholeheartedly to the opportunities presented by modern electronic equipment. It may not be too rash to predict that, within the space of 5 or 10 years hence, it will become second nature for the actuary to have the use of a desk-top machine of his own—perhaps a terminal linking him to the Office's mainframe, or a stand-alone computer capable of a wide variety of functions. . . . It is not only throughput and efficiency of work that will be affected by this "Desk-top Revolution." The actuary's whole attitude towards, and view of, the work he is engaged in are likely to be transformed. . . .

E.J.M.

Consumer Group

(Continued from page 3)

sale of high-priced credit life insurance for Annual Percentage Rate (APR) disclosures under Truth in Lending, aimed at showing how much APR's are distorted when prices exceed reasonable levels.

• *Consumer Booklet*: We sell for $5 a booklet, "How to Save Money on Life Insurance." We urge that most buyers purchase annual renewable term insurance and recommend maximum rates they should pay.

• *Health Insurance*: We think commissioners should upgrade the minimum standards in the Baucus Amendment (Public Law 96-265) that would set up a program of voluntary certification of Medicare supplement policies. Benchmark would be a 60% loss ratio.

NICO is not yet a membership organization, but we have built a mailing list from nearly 5,000 persons who have written following our President's appearance on the Phil Donahue and Mike Douglas TV shows. We can accept tax-deductible contributions, and in due course will seek members. We would like to hear from Society members, at 344 Commerce St., Alexandria, VA 22314, (703) 549-8050. □

DEALING WITH INFLATION AND UNCERTAINTY

by Henry K. Knowlton

Ed. Note: These are excerpts from Mr. Knowlton's presidential address to the Southeastern Actuaries' Club on November 21, 1980.

The only thing we could all possibly agree on today about the economic situation is that the degree of uncertainty is high. It is this uncertainty that presents us actuaries with professional problems which cannot be addressed by traditional methods. Yet there is a lot we can do to live with both inflation and uncertainty, and in some sense to accommodate them, which will both enhance our profession and help protect the publics we serve.

Repeal

It seems to me that we should do all within our power to encourage the repeal of both the present Standard Nonforfeiture Law and the Standard Valuation Law. Although both have been amended to permit using higher interest rates, these laws in their current form were devised in the 1940's and date back to actuarial customs of the 19th century. It is only with considerable pain that many non-traditional products can be accommodated within the framework of these traditional laws, and I have no doubt that the public could be better served if these laws were simply repealed, and the constraints that they put on the marketplace thus removed. As an aside, if we could eliminate the Standard Valuation Law, and determine a company's liabilities and assets on a more rational basis, there would be no need for separate statutory and GAAP annual statements. This may be wishful thinking, but it's essentially what has happened in Canada.

Modelling

When asked what an actuary's primary business is, my usual reply is that we're in the business of making financial models. In my view, the largest deficiency in our models is that they are often made in an economic vacuum. We too often set forth assumptions without specifically outlining what economic conditions would support them, and in doing so too frequently end up with assumptions that are inherently inconsistent.

Twenty years ago in profit-testing ordinary insurance, actuaries were assuming an interest rate in the area of 3.75% graded to 3% over 20 years. Our current assumptions are more like 7½% graded to 6% at 20 years, and to 5¼% at 40 years. In an era of increasing interest rates, we continue to predict a downturn of the same magnitude today as we did 20 years ago. If we consider that our financial projections are valid only if our assumptions are consistent with an economic environment which might validate them, then it seems to me that much of our work will not stand close scrutiny.

Three Rules

If we are to live with inflation and uncertainty, and at the time maintain our professional standards, it might help if we followed a few simple rules.

Rule 1. Actuaries should explain their assumptions, both in actuarial terms and in terms of the underlying economic scenario which supports them.

> *Corollary to Rule* 1—One economic scenario must be used to explain all assumptions in any one set.

Rule 2. The probability of any one set of assumptions being correct, and therefore any one answer being correct, is zero.

> *Corollary to Rule* 2—The degree of uncertainty that faces us today requires more than one answer.

Rule 3. The actuary should be ready, willing, and able to explain why his assumptions were wrong, in both actuarial and economic terms.

> *Corollary to Rule* 3—In explaining where he went wrong, the actuary is prohibited from blaming more than one regulatory agency at a time. □

BOOK REVIEW

Peter F. Drucker, *Managing in Turbulent Times*, Harper & Row, New York, 1980, 231 pp, $9.95.

Reviewed by Willis B. Howard, Jr.

Writer on management for over thirty years, Peter Drucker is held in the same esteem by students of that art that Robert J. Myers enjoys among students of Social Security. In this book he exhibits the vigor and insight that have earned him this position. One need not accept all his conclusions to profit from his analysis.

To anyone familiar with the unsettled outlook for our economic, social and political environment, this is a troubling book. It is troubling because Drucker's credibility as a management analyst is so high, and because the turbulent times that he identifies call for changes in management attitudes and practices that are difficult to make. In the introduction, Drucker tells us: "This book deals with the strategy needed to use rapid changes as opportunities, the strategies needed to convert the threat of change into opportunities for productive and profitable action and for contribution alike to society, economy, and individual."

The book is arranged into two short opening chapters and two longer, more philosophical chapters. The first two sections of Chapter 1, "Managing the Fundamentals", should be of particular interest to actuaries; these are called "Adjusting for Inflation" and "Managing for Liquidity and Financial Strength." Drucker offers no precise method by which we may adjust for inflation—indeed, he argues persuasively that precision is unnecessary—but gives compelling reasons why we should: "During inflation, however, the figures lie . . . Money still tends to be considered the standard of value and to be a value in itself, but in inflation this is a delusion . . . Until this is done, even the most knowledgeable executive will remain the victim of the illusions inflation creates. He may know that the figures he gets are grossly misleading; but as long as these are the figures he has in front of him, he will act on them rather than on his own better knowledge. And he will act foolishly, wrongly, irresponsibly."

Actuaries whose companies have experienced a policy-loan-induced cash flow problem may wish they had read his comments on liquidity a year ago: "The stock market increasingly values companies according to their liquidity rather than by earnings . . . The stock market is right. In turbulent times, liquidity is more important than earnings."

Treatment of the remaining topics in this chapter is no less dramatic. In "The Costs of Staying in Business vs. the Delusion of Profit", Drucker makes a strong case for valuing the cost of capital at current market rates in determining earnings, and, in passing, censures executive compensation plans that do not do this: "There is also an urgent need to adjust executive compensation to economic reality. As long as executives get extra compensation based on reported 'profits', they will resist changing the way they report their earnings. Extra compensation based on profits should never be paid until the costs of staying in business have been covered by current earnings. Not to disclose that the genuine costs, the costs of staying in business, have not been earned is fraud. To pay oneself 'bonuses' based on a nonexistent profit is embezzlement."

The theme of Chapter 2, "Managing for Tomorrow", is: "In turbulent times, managers cannot assume that tomorrow will be an extension of today. On the contrary, they must manage for change; change alike as an opportunity and a threat." Drucker summarizes in its final section, "A Scorecard for Managers": "Performance in management, therefore, means in large measure doing a good job of preparing today's business for the future."

He seizes attention at the outset of Chapter 3 thus: "None of the headline-makers with which we are so constantly bombarded—neither OPEC nor all the promised shortages of food, metals, or minerals that are now so widely predicted, nor any other 'crises' of the moment —are nearly as important, let alone as real, as the changes taking place in population structure and population dynamics." Drucker calls this Chapter "Managing the sea-change: The New Population Structure and the New Population Dynamics", and in his positive, confident style tells us how these changes will affect a myriad of present concepts and practices including new consumer markets, managerial strategies, the labor force, and retirement age.

Regarding retirement age, he makes an actuarial observation: "In every developed country, it will have to be a central aim of enonomic and social policy to keep the ratio between people retired for age and people working at around three to one*. This means that in all developed countries the . . . age at which people can be expected to stop working is likely to be closer to seventy-two by the year 1995 than it is to the sixty-five of traditional western retirement, let alone to the fifty-five of the Japanese tradition."

In Chapter 4, "Managing in Turbulent Environments", Drucker continues to identify new realities, new challenges, new uncertainties, in three interrelated facets of management's environment, i.e., in the world economy, the employee society, and the business enterprise as a political institution. That these are formidable challenges may be inferred from the absence here of the pithy directives found in prior chapters. Perhaps it's too much to ask, even of a thinker of Drucker's stature, for more than a classification of the hazards that face us; this is, after all, a book on management strategy, not on short-term tactics.

In his concluding comments, "The Challenge to Management", Peter Drucker reiterates his main points, and ends on this surely sobering note:

> "Rarely has a new social institution, a new social function, emerged as fast as management in this century. Rarely, if ever, has it become indispensable so fast. But rarely also has a new institution, a new leadership group, faced as demanding, as challenging, as exciting a test as the one that managing in turbulent times now poses to the managements of businesses and nonbusiness public service institutions alike." □

*The author has his ratio upside down here. He means one to three, approximately today's ratio of OASDI beneficiaries to covered workers.

THE CANADIAN PENSION DEBATE

By James G. Paterson

An appetite for suggestions on how to reform a nation's retirement system is bound to be satisfied by recent Canadian offerings. The last four years have seen no fewer than five government-commissioned studies, viz.,

"Cofirentes + ", a Quebec committee.
"One in Three", the Economic Council of Canada.
"Retirement Without Tears", Special Senate Committee on Retirement Age Policies.
"Retirement Income Policy in Canada", the Federal Government's Lazar Task Force.
Report of the Royal Commission on the Status of Pensions in Ontario.

Their tasks varied from narrow to extremely broad. The Economic Council's main theme was, "Can Canada insure its older generation an adequate income without risk to the economy?" (its answer was Yes). The Senate Committee focussed on retirement age, mandatory or flexible retirement, age discrimination in employment, and need for cooperation among governments, unions, business and the public. The other three (and to a large degree, the Economic Council as well) examined all pension types ranging from government programs, through social insurance and private pensions, to personal savings. They examined design, financing and administration of pensions and their regulation.

Consensus

On some issues all five reports more or less agreed: that among the elderly there's too much poverty which is heavily concentrated among women; that current vesting and portability systems hurt mobile workers; and that better pension protection against inflation must be found. Four wanted increased funding of the Canada and Quebec Pension Plans (CPP & QPP), though the Ontario Royal Commission favored reduction to a virtual pay-as-you-go system. Three recommended that all public service pensions be governed by funding and investment rules like those in the private sector, and that at least part of their funds be invested in private sector securities.

Cleavage

On just how to improve Canada's pension system, agreement was lacking. The Quebec report recommends that CPP and QPP benefits be raised on earnings up to half the earnings ceiling, (from 25% to 50% of pre-retirement earnings). It also seeks greater vesting, portability and indexing in private plans. Despite its criticisms, the Economic Council fell short of recommending either that CPP and QPP be expanded or that there be mandatory minimum private pensions; it proposed that governments "encourage and induce" greater coverage through better vesting, portability, indexing (and perhaps surviving spouse rules) for private pensions, and through locked-in registered retirement savings plans.

The Senate Committee called for improved CPP and QPP benefits and for flexible retirement as well as broader coverage, vesting, portability in private plans. The Task Force offered four alternatives for pension reform via government legislation, and estimated what each would cost. All include tighter rules for vesting, portability, indexing and surviving spouse pensions. *Option* 1 would continue the present voluntary private system—predominantly a defined benefit system. *Option* 2 would convert it to a voluntary money purchase system. *Option* 3 would create a mandatory level of private pensions, imposed on all employers and employees. *Option* 4 would expand CPP and QPP, increasing the earnings base by half to one-and-one-half times the average industrial wage, and raising benefits from 25% to 45% of pre-retirement earnings.

The Royal Commission proposes no change in the CPP but recommends a mandatory universal, fully vested and fully portable money purchase plan invested totally through the private sector and producing replacement ratios between 15% and 20% of pre-retirement income. It also recommends improved vesting and tighter retirement age and surviving spouse rules under private programs, and addition to each plan of a "participating annuity" optional form of pension on the "excess interest" principle.

Vesting proposals for private sector plans differ widely, the maximum being that of the Senate Committee—100% after one year of service.

Indexing

Diversity also features indexing recommendations. "Cofirentes +" wants present and future pensions adjusted by excess investment earnings over the real net-of-inflation yield; it would also require that pension liabilities be valued using what the government prescribes as the real rate of return. The Economic Council suggests that the federal government underwrite and issue price-indexed annuities to retired persons. The Senate Committee offered no specific indexing proposals, but the Federal Task Force presented four alternatives, each embracing either the excess interest principle or government underwriting of indexing. The Royal Commission proposes an "inflation tax credit" through the income tax system, payable from age 68.

The Debate Continues

A National Conference organized by the federal government will have been held before this article appears. Three hundred, representing all provincial governments and various regional, national, social, economic and professional groups, have been invited. Consensus is sought on private pension reform with particular attention to the proposals outlined here. □

EARLY COMPUTER DAYS IN CANADIAN LIFE INSURANCE

by Hudson J. Stowe

Ed. Note: Mr. Stowe was a pioneer in the introduction of computers to business use in Canada. He gratefully acknowledges the help of Messrs. Albert L. Wright and J. T. Bradbury in supplying and confirming details for this account. The Actuary *would welcome letters from readers that would help to enlarge the record of Canadian actuaries' early contributions in this field.*

In 1936 William Phillips ("Ahead of His Time," November 1980 issue) sent a copy of his Institute paper, "Binary Calculations," to me in Toronto. I immediately showed it to I.B.M. and offered to act as their agent in acquiring his now famous model. But soon after this the war started, causing computer design to be concentrated on machines suitable for scientific problems to further the war effort.

(*Continued on page* 7)

Early Computer Days

(*Continued from page 6*)

Not until 1947 did developers turn their attention to developing a computer for business use. As the then President of the Insurance Accounting and Statistical Association I invited Edmund C. Berkeley (who had worked on these machines during the war) to speak at its annual meeting on how such a machine could be used to underwrite insurance applications.

Developments at Manufacturers Life

In 1952 the University of Toronto installed a Feranti Ferut, primarily to do scientific calculations for the National Research Council of Canada. We approached the University about my company (Manufacturers Life) trying to make use of it. In June 1953 our John H. Bell took a course and decided we could use it to calculate immediate annuity rates. Under his supervision the University staff wrote the programme by which rates were calculated and recorded on punched cards, from which tables of rates were prepared and copied by photo offset for field distribution. In that era of rapidly changing interest rates we found we could produce new rates in a matter of a couple of weeks, giving our agents a decided competitive advantage.

That fall I arranged a programing course—one afternoon a week over several weeks—attended by about twenty Toronto life company people. A few weeks later, I.B.M. put on a seminar in Toronto to announce their new small scale computer (the 650) using punched card input and output. The following month our company placed an order for this machine—the first ordered and delivered in Canada.

Training and planning started in early 1954; by June 1955 the first programme had been tested; in March 1956 the machine was delivered, and by October was producing results.

In June 1958, under the auspices of the University of Toronto, a seminar on the use of computers was held. This attracted so many that we wound up with enough left in the treasury to found the Computing and Data Processing Society of Canada.

Parallel Activities at Sun Life

In 1948 the late John W. Ritchie of the Sun Life of Canada had been a member of the Society Committee on New Recording Means and Computing Devices. Because of his experience that company in 1953 set up its own committee. In 1956 they ordered a Univac, which at that time seemed the best available for life insurance operations. Three of their branches were converted to the computer system, and their people would go to New York each month to update their file there. Their Univac was delivered and operations commenced on May 30th, 1958. Its uses increased so much that even operating on a 24-hour schedule there was insufficient machine time. By the end of 1961 a second machine was ordered. □

$\sqrt{N(N-1)}$

Years ago, long before he became our Director of Education, Linden Cole recommended in these columns that actuaries support the work of a non-profit organization called the Population Reference Bureau. We are among those who took Mr. Cole's advice, and we've never regretted it. Which brings us to an article that appeared in that Bureau's magazine, *Intercom*, for January 1981, entitled *The Mechanics of Congressional Apportionment*. Its authors are Dudley L. Poston, Jr. and Marion Tolbert Coleman.

To the extent we had thought about the matter at all, our assumption was that after giving each state the single U.S. House seat to which it is entitled regardless of its population, the remaining 385 seats would be apportioned by first dividing the total enumerated population by 385 and then dividing each state's population by that resulting figure, rounding the result to the nearest integer, and finally adjusting by one seat somewhere if the total comes to 384 or 386 instead of 385.

But the Poston-Coleman article tells us that:

> "The method of equal proportions attempts to achieve the fairest distribution possible . . . (Its) first step is to multiply the . . . population of each state by the following fraction:
>
> $$\frac{1}{\sqrt{N(N-1)}}$$"

As this "equal proportions" procedure apparently is applied, the values of the denominator of the above fraction as N takes its successive values 2, 3, 4 . . . , are divided into each state's population, and the results tabulated. These values for all the states are then listed in order of size until the list is 385 items long. Each state's roster of representatives is then declared to be equal to the number of times that one of its tabulated figures appears in that long list.

Thinking it interesting to see, for a few states, how the two methods compare, we worked out the results for the states numbered (by population) first, tenth, twentieth, thirtieth, fortieth and fiftieth. See the table below.

The rationale of the $\sqrt{N(N-1)}$ method, in use since 1941, is undoubtedly obvious to our readers, and we would welcome letters justifying it.

An individual membership in Population Reference Bureau Inc. costs a tax-deductible $25 per year. Apart from the satisfaction derived from supporting an excellent organization "engaged in the objective dissemination of population information," an actuary who becomes a member receives a liberal quantity of high-quality literature. PRB's address is 1337 Connecticut Avenue, Washington, DC 20036.

E.J.M.

			Seats, beyond First Seat	
		Population	*Our Method**	*Official Method*
1	California	23,668,562	40	44
10	North Carolina	5,874,429	10	10
20	Washington	4,130,163	7	7
30	Oregon	2,632,663	4	4
40	Rhode Island	947,154	2	1
50	Alaska	400,481	0	0

*We divided 225,867,174 (total population excluding D. C.) by 385, producing an allocation of 586,668 people per seat, and then we divided each state's population by 586,668, rounding to the nearest whole number. In Oregon's case, our answer, we admit, was a trifle closer to 5 than to 4.

LETTERS

Computer History

Sir:

Alfred N. Guertin (Letter, February issue) is correct in saying that William Phillips was influential with the computer developers of the 1940's. I recall bringing his 1936 paper to the attention of Samuel Alexander (Bureau of Standards), James McPherson (Census Bureau Machine Development Officer) and John Parker (in charge of developing and marketing Univac I). These three men were in the forefront of computer development in those days.

I still marvel at the foresight displayed in his paper. Not only was he "Ahead of his Time", he was also "With It". He kept abreast of developments throughout the 1950's. And he supported and encouraged those other pioneers (Kenneth Usherwood of London, Johannes Engelfriet of Holland, Arnaldo Luvini of Italy, for example), then delving into ways of effectively using the new technology.

During a visit I had with him in 1960 we spent hours debating. He argued for emphasis on simpler, more technologically advanced computers; I, for somewhat less of that and more on the fundamental changes possible in products and institutions during an electronic age. It was an enriching bull-session.

John J. Finelli

Ed. Note: This writer knows whereof he speaks. William Phillips himself wrote in 1960, *"John Finelli shares with Prof. Dr. Engelfriet the distinction of belonging to that small band of people who have been constant and unshaken in believing in the potentialities of electronic computers, working in the binary scale of numeration, ever since January* 1936." *Phillips went on to speak highly of John Finelli's willingness to share his knowledge with others, mentioning Finelli's presentation at the Fifteenth International Congress of Actuaries (New York,* 1957), *and his paper presented by invitation to the Institute of Actuaries in February* 1960. □

* * * *

COMPETITION NOTES

Robert W. Maull is our first guest actucrostician and first winner of the album offered in February. Bob not only contributed a quotation, he did the whole puzzle except for the clues. His fine piece is this month's Actucrostic.

Ralph E. Edwards has favored us with a puzzle of the type that Peter G. Moore says requires only "basic hypothesis testing and straightforward deductions." It will appear next month.

C.G.G.

Rift

Sir:

The value of the FSA designation is being diminished. Why? Because our own leadership has been steadily downgrading the Society in favor of other actuarial organizations.

This is shown by the proposal to grant FSA's to members of the Fraternal Actuarial Association, the drastic revision and complication of our education system in order to cooperate with the Joint Board, the use of AERF instead of the Society for actuarial research, and eforts, carried on to a major extent by FSA's, to get the public to believe that a qualified actuary is an MAAA rather than an FSA.

If one asks, "How can this be?", the answer is simple. Our elected leadership refuses to be accountable to the Fellows through the election process.

The Board has refused to allow reasonable audit procedures in ballot counting. It reduced the minimum number of candidates for elected Board positions from 18 to 12, to give the Committee on Elections greater control. It refuses to give the Fellows enough information about candidates so that they can vote for persons known to share their viewpoint. It has refused to open its meetings to attendance by members, or even to let them know which Board members voted on which side of key issues.

No one of these by itself creates a crucial problem. But taken together they demonstrate that the Board is not representative of the membership and refuses to change the election and management processes to allow it to become so.

Though the fault lies with the leaders, it lies also with the many Fellows who "leave it to the other guy" to bring the Society's direction back to where I perceive the members want it, based on the FAA vote.

If the FSA designation won't get you younger FSA's a decent job 5 or 10 years from now, don't blame me—I tried. Did you?

Peter W. Plumley

* * * *

Thoughts On the Benedict Thesis

Sir:

I hope that Mr. E. R. Benedict's book, *Protecting Retirement Against Inflation*, (reported in October 1980 issue) can be published and that it will be widely read. I enjoyed reading his manuscript, and found the rationale and mechanics of the proposal well described.

It would probably be good for the country if the groups who would benefit from this proposal were to advocate it strongly. This might help Congress and federal bureaucrats realize that retired people who have paid for a lot of the inflation don't intend to continue doing so, and if they won't pay for it somebody else must. Thus, the plan's principal value lies in its possible salutory effect on dedication to inflation-fighting. That is reason enough to advocate it—as a method for shortening the fuse on the inflation time-bomb.

Yet if it came to a final vote, mine would be against the proposal. As I see it, the only cure for inflation is to eliminate federal deficits and stabilize the money supply. All attempts to shift the inflation burden—in this case from the retired to the taxpayers—mean reducing injustice in one place by increasing it elsewhere.

Armand C. Stalnaker

Ed. Note: The writer, Chairman of the Board of the General American Life Insurance Company, is a valued subscriber to this newsletter.

Mr. Benedict responds that he deplores, every bit as strongly as does Mr. Stalnaker, the indexing of wages and salaries, and likewise ad hoc general wage increases which are just as pernicious. His plan specifically advocates stopping such indexing and bringing the increase in the general wage under control. It is as a means to this end that he recommends fair-sharing of the continuing burden.

* * * *