The Actuary
The Newsletter of the Society of Actuaries
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IMMUNIZATION WITH (ALMOST) NO MATHEMATICS

by Irwin T. Vanderhoof

Having talked (and written) about immunization for years, I've found a glazed look followed shortly by loud snores to be the normal audience reaction. Yet, after three or four of these lectures, faithful listeners tell me that the subject is simple and they can't understand why they ever had a problem. So, with some concern about disturbing readers' sleep habits, I offer a simple illustration requiring only high school algebra rather than the ordinary and stochastic calculus that has been applied to this subject. Once a simple example is understood, the elaborations that now stud actuarial and financial literature become comprehensible.

Illustration

Assume that today's interest rate for all maturities is 10%, that you now have $1,000 and that you need $1,100 one year from now. Assume further that the only investments available are a money market fund, where interest rates change daily, and a two-year obligation, without coupon, that matures for $1,210. How can you invest your money so as to be assured of $1,100 in one year regardless of changes in the interest rate?

Needing to avoid the losses that may ensue if either you invest short and interest rates fall, or if you invest long and interest rates rise, what do you guess to be the right investment strategy? You are absolutely correct! You have instinctively made the right decision—to invest half your money short and half long. Let's see why.

If the interest rate remains at 10%, the following expression displays the identity between our investments and

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"THE EDUCATION AND TRAINING OF ACTUARIES"

The above is the title of an extraordinary paper presented to the Institute in London in January 1982 by W. W. Truckle, F.I.A., Director of that body's Actuarial Tuition Service. Written to provide a framework for oral and written discussion, it features questions rather than opinions.

This summary is limited to subject headings and the questions that end each section, but we cannot resist giving also the apt quotations Mr. Truckle has picked to headline each of his topics. For his paper as a whole he quotes Francis Bacon: "I would live to study, and not study to live."

(1. is an introductory section.)

2. Policy

2.1 *What an actuary needs to know*

"A smattering of everything, and a knowledge of nothing"—Dickens

Ques.: What are the limits of knowledge to be demonstrated by a qualified actuary, distinguishing between essential subjects (to be examined) and incidental subjects (to be treated as post-examination education)?

2.2 *Adaptation to change*

"Knowledge advances by steps, and not by leaps"—Macaulay

Ques.: How do we ensure that developments in the actuarial and allied fields are adequately monitored and tested?

Ques.: Do we need to clear a route by which the results of research into new ideas are filtered into the educational and examination system so as to create and maintain a momentum of change?

2.3 *The scope of actuarial education*

"I don't know why they make all this

(*Continued on page 6*)

COMMITTEE ON ELECTIONS INVITES VOLUNTEERS FOR LEADERSHIP

The Committee on Elections cordially invites any Fellow who would like your availability as a nominee for election to the Board of Governors to be drawn to our voters' attention on this year's first ballot, to write to its chairman (Julius Vogel, Senior Vice President & Chief Actuary, Prudential Insurance Company, Newark, NJ 07101) giving a brief summary of your background and accomplishments. You should do this before May 7, 1982.

In 1981, for the first time, a "reference list" of over 70 names, compiled on specific criteria having to do with past services to the Society, was offered as possible nominees for the Board. This year's committee will repeat this procedure, and will include in that same list such names from among those who respond to this invitation as the Committee picks on the strength of the material those volunteers submit. The list won't identify which actuaries volunteered their names.

Service on the Board of Governors is for a three-year term and requires attending three or four Board meetings a year. Meetings, frequently held on weekends adjacent to Society meetings, may last a day or a day-and-a-half. Board members (or their employers) pay the costs of attending these meetings. Board members occasionally serve on special committees that require additional travel and correspondence. Board service necessitates careful advance review of lengthy and detailed agendas. □

The Actuary

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The Society is not responsible for statements made or opinions expressed herein. All contributions are subject to editing.

EDITORIAL

HEALTHY SKEPTICISM

In May 1981 the Academy distributed an exposure draft, "Qualification Standards To Sign Statements of Actuarial Opinion on NAIC Annual Statement Blanks." In it we read, with pleasure, the following bit of proposed wording:

> "Before considering himself or herself qualified, the actuary should have sufficient experience . . . With that experience the actuary should have . . . developed a healthy skepticism concerning data and other information proffered by others . . ."

Personal experience, some painful, had taught us not merely that dictum's soundness, but also the frequency with which actuaries are prone to overlook it. The guiding principle, "Apply the test of reasonableness to all figures you are given," has been violated many times. A pair of horrific malfeasances of the past dozen years might indeed have been detected much earlier if some actuaries had been true skeptics. And today we have that new menace, computer frauds, to deal with.

But the wording that was approved by the Academy Board in October 1981 was different—in our view much less stirring:

> ". . . With that experience, the 'qualified actuary' should have learned how to apply his or her education to learn the proper techniques of validating data and results . . ."

Gone was the advice about healthy skepticism. We quizzed the committee chairman, William D. Smith, about this deletion. Mr. Smith generously supported our proposal to write an editorial on this subject. Said he:

> "I believe it is a good idea to get some discussion of this into our literature. Why not tell the situation, decry the loss and make your comments. I agree wholeheartedly that actuarial competence involves being a healthy skeptic, both words important. One must be a skeptic about everything and one must be healthy about it . . . An unhealthy skeptic is sour on everything—a healthy skeptic applies himself to find and be delighted with that which is good, and to root out that which is bad."

Mr. Smith recollects that he acquired this point of view from Wendell Milliman, and indeed it does have the ring of Mr. Milliman's philosophy.

Although fully sympathizing with the Committee's apparent reason for discarding the "healthy skepticism" phrase—i.e., to shorten the document and to increase uniformity between the life and casualty versions—we think the incident teaches that readers of exposure drafts had better start commenting favorably on parts that we specially like rather than just critizing wordings that we find objectionable.

E.J.M.

ACTUARIES AT WORK IN OTHER LANDS: MALAYSIA

by Steve S. V. Wong

Ed. Note: This is the second article in a series.

Malaysia, a nation in the South East Asia region, has an area of 128,000 square miles and a population of 13 million. Its capital city is Kuala Lumpur.

Our life insurance industry originated in 1956, and is still a new concept to most Malaysians though the need for it is growing. Strong family ties of the past have caused people to feel little or no need for independent incomes for the widowed, the aged or disabled; other family members have readily assumed responsibility for their care. For the same reason, pensions and other employee benefit programs are quite new here. At the end of 1980, Malaysia's 18 life insurers had an aggregate of 700,000 policies in force, little more than one policy for each 20 people in our country.

The Profession, Now and In Prospect

We have only four Fellows (of the Society, Institute or Faculty of Actuaries)—one Malaysian and three non-Malaysians. In addition, we have 14 Associates and about 40 actuarial students. Only Fellows are recognized as qualified actuaries by the Malaysian Government.

Actuarial practices here are influenced by those of other, especially English-speaking, countries. The Malaysian Insurance Act is modelled after Australian laws; insurance plan design is strongly influenced by products of the United Kingdom and the U.S.A.; training of actuaries is prevailingly British-oriented.

The excellent growth potential of life insurers here has created great awareness of the need for more actuaries. Local life insurance companies and actuarial consulting firms are giving various incentives to encourage more students to take the professional examinations, and an institute of higher learning, MARA Institute of Technology, gives a 4-year course in actuarial science, instilling actuarial knowledge and preparing students for basic professional examinations.

(*Continued on page 3*)

Actuaries in Malaysia

(*Continued from page 2*)

What Our Actuaries Do

Eleven of our 18 Fellows and Associates work in life insurance companies; four are in consulting firms; one is in government, and two are in other fields. The responsibilities of life company actuaries correspond to those that are common elsewhere, including statistical research, construction of tables and product design as well as premium and dividend calculation, but actuaries are involved also in investments and company management. The three actuarial consulting firms in Malaysia provide a variety of actuarial services for private retirement systems, and also do job evaluation and salary scales, trust fund administration, and consulting services to the government Employees' Provident Fund, government pension plans, and life companies that have no qualified actuary.

Actuarial Society of Malayasia

A professional body, the Actuarial Society of Malaysia, with its registered office in Kuala Lumpur, was formed in 1978, and now has about 50 members. In addition to promoting study, discussion, publication and research within the profession, assisting students in their actuarial studies, and developing social relationships, this Society has contributed much in the form of submission to Government on retirement plans, revising the Insurance Act, and budget dialogues with the Ministry of Finance. Currently the Society is undertaking to compile a Malaysian Director-General of Insurance mortality table based on recent experience among assured lives.

In June 1981, our Actuarial Society organized its first international actuarial seminar, attended by participants from countries like Asean, Taiwan, Japan, United Kingdom and Australia. Views and ideas on actuarial practices, the role of actuaries in public service, and employee benefit practices in the Far East, were exchanged.

In summary, it can be said that though the number of actuaries in Malaysia is small, their contribution to society is as significant as that of their colleagues in other lands. □

PROPOSALS IN CANADA FOR TAXING POLICYHOLDERS

by Robert Blane

Friday, November 13th, 1981 was not a happy day for life insurance people in Canada!

One day previously, the Federal Finance Minister had introduced a budget proposing major tax reforms, several of which would seriously affect our industry. Many of these, initially, were to apply retroactively as well as prospectively. It had not been customary to present such sweeping changes without adequate public discussion, and their retroactivity was unwarranted.

The Proposals

The main taxation proposals affecting holders of life insurance and deferred annuity policies are:

(1) On life insurance policies issued, and deferred annuities acquired, after November 12, 1981 policyholders would be taxed every three years on the "accrued investment income." This would apply also to annuities previously acquired.

(2) On disposition of policies after November 12, 1981, the insurance element of the premiums paid would be excluded in determining the policy's adjusted cost basis. (Originally it was proposed that this apply to existing policies also.) The tax would be on the excess of the surrender value over the investment portion of the premiums.

(3) Life insurance policies not registered as retirement savings plans issued after November 12, 1981 would be taxed at the insured's death on the excess of the cash surrender value over the policy's adjusted cost basis. The budget papers were not clear whether the tax already paid on accrued investment income would be taken into account as an offset.

(4) Partial surrenders of life and annuity policies after November 12, 1981 would be regarded as part capital (nontaxable) and part income (taxable).

The budget papers gave no guidance on basic matters such as how "accrued investment income" was to be determined. They contained other proposals affecting our industry, one being that employees be taxed on employer contributions to medical and dental plans.

Where The Matter Stands

By December 18, 1981, after separate representations by the Canadian Life and Health Insurance Association and the Life Underwriters Association of Canada, the retroactive application of Item 2 above was withdrawn, and other changes were announced. The Minister proposed that Item 1 above for life insurance policies be referred to a Parliamentary Sub-Committee. It since appears that whole life policies that clearly are for protection rather than investment may be exempted. Discussions continue. □

Deaths

John J. Elliott, A.S.A. 1978
Marcus Gunn, F.S.A. 1920
Elder A. Porter, F.S.A. 1922

ENQUIRY COMING!

Though dwarfed by many other professional bodies, the Society has more than compensated through our strong committee structure. Our volunteers have devoted many unselfish hours to committee work and, in the process, have created what we have today—a vigorous organization. Sustaining that vigor depends on you—our members—your interests, your needs, your willingness to become a part of the Society's decision process through its committees.

To learn more about what you can do for the Society, and what the Society can do for you, the Committee on Professional Development is about to survey all members. Your survey responses, stored in our computerized data base, will be a source for the Officers and Committee Chairmen to use when committee vacancies develop or new committees are being formed.

You will receive your questionnaire this spring. Please take the time to respond. You will be helping to ensure the continued growth and development of our organization and its committee structure.

Linda M. Delgadillo
Director of Communications

Immunization

(Continued from page 1)

our needs:

$$500 + (1210/2)(1/1.1)^2 = (1100)(1/1.1)$$

If the interest rate changes, either upward or downward, to y, then let's let $x = 1.1/(1+y)$. The value of the first term above is still 500, but the value of the second term, which had been 500, now becomes $500x^2$, and the third term, which had a numerical value of 1000, now becomes 1000x.

Dividing all these terms by 500, the new equation will have on the left side $1 + x^2$, and on the right side, 2x. Now, let's be high-class about this and prove a lemma:

Lemma:	$1 + x^2 \geq 2x$
Since:	$(1 - x)^2 \geq 0$
	$1 - 2x + x^2 \geq 0$
Therefore:	$1 + x^2 \geq 2x$

We can, therefore, be very comfortable with our instinctive decision to put half of our money into each of the two investments. Whichever way interest rates change, the combined holding will be adequate to provide the needed $1,100.

Since this result just doesn't seem reasonable (even to me), let's look at what we have done and see how it relates to the complex formula usually used to determine duration.

What we did was to choose our investments so that our invested funds, on the average, matured at our target date. The complex formulas for duration are the inverse of this calculation, wherein we look at a bond or mortgage and determine for what period, on the average, we have made our investment. The crucial point is that the calculation isn't based on a weighting, using amounts to be paid multiplied by the time till payment—this gives the average maturity date, which is a different thing. Rather, in these duration calculations, we multiply the *present value* by the time till payment so as to get an average term for our investments.

The Basic Idea

The simple, basic idea behind immunization is that all investments that have the same duration, or average life, have the same changes in value when interest

(Continued on page 7)

SOCIETY FINANCES IN PERSPECTIVE

by Robert J. Johansen, Treasurer

Inflation, membership growth and broadened activities have all boosted the Society's budget through the years. Added to our staff have been an Executive Director (1968), Director of Education (1977), Communications Manager, now Director of Communications (1978), Director of Finance (1979), and Director of Research (1981). Seminars, part of our continuing education program, have grown rapidly; 41 are in prospect for 1981-82.

Table I shows how our 1981-82 budget stacks up with results for 1980-81, and to the extent possible with two widely separated earlier years. The present cost-center accounting doesn't go back farther than 1980-81, preventing fully detailed comparisons with the early years; a three-year comparison on the old basis is available in *The Actuary*, December 1981.

Table II shows these figures adjusted for CPI changes since 1958-59, a period during which the Consumer Price Index has more than tripled.

Adjusted income from dues reflects, of course, membership growth as well as the dues scale itself; likewise, examination fee income grows with numbers of students as well as the fee level. Inflation-adjusted expenses per member increased between 1958-59 and a decade later, but have remained fairly stable since, as have, even more so, adjusted dues per member.

The Society's ability to engage in new activities on members' behalf evidently comes largely from growth in the number of our members.

Table I

SOCIETY INCOME AND EXPENSE

(Amounts in Thousands)

Income	1958-59	1968-69	1980-81	Budget 1981-82
Membership Dues	$ 44 M	128	801	932
Seminars			186	350
Meetings	1	40	264	301
Exam Fees	26	108	830	903
Publications	32	53	136	95
Investment Income	5	11	134	125
Other Income	15*	34*	408	436
Total Income	123*	374*	2,759	3,142
Expenses (By Cost Center)				
Seminars			208	348
Meetings			261	303
Examinations			1,056	1,011
Public Information		(Figures by	46	62
Research Services		Cost Center	3	112
Other Memb. Services		Not	873	1,002
Gen. & Administrative		Available)	283	301
Total Expense	114*	391*	2,730	3,139
Income Less Expense	+ 9	− 17	+ 29	+ 3
Statistics				
Number of Members	1,822	3,275	7,697	8,447
Dues per Fellow ($)	30	50	130	145
Expense per Member ($)	60*	120*	355	370
Equity per Member ($) (Funds on hand)	143	77	66	60

*These figures, and the same ones in Table III, would be higher if the assessments and expenses for mortality and morbidity reports had been accounted for in the manner used today.

OUR FELLOWS BY YEAR OF ADMISSION

The Society's computer has obediently coughed up an array of our 4,646 Fellows by year of completing Fellowship. These figures, composed of the 4,480 Fellows shown in our current Yearbook as of November 1, 1981 increased by 178 who qualified in the November 1981 examinations and decreased by deaths and other terminations, give our roster at year-end 1981.

The Old Guard

The 337 of us in Table I are the survivors from about 850 who earned Fellowship in the old Society or American Institute, or of course in both. From among those 850 the number who in 1949 became the charter Fellows of the present Society was 642.

Table I: 1919 to 1948

1919	1	1934	8
1920	4	1935	12
1921	2	1936	13
1922	2	1937	10
1923	1	1938	4
1924	4	1939	14
1925	7	1940	12
1926	14	1941	12
1927	6	1942	12
1928	4	1943	10
1929	8	1944	12
1930	11	1945	19
1931	12	1946	31
1932	9	1947	29
1933	12	1948	42
			337

Our respected seniors for the years 1919-1925 were: 1919, Erston Marshall; 1920, William P. Barber, F. Bruce Gerhard, Marcus Gunn, James E. Hoskins; 1921, Horace Holmes, Francis M. Smith; 1922, Alden T. Bunyan, Elder A. Porter; 1923, J. Gordon Beatty; 1924, Albert E. Babbitt, Reinhard A. Hohaus, George L. Holmes, James T. Phillips; 1925, Reginald C. Barnsley, George V. Brady, Thomas K. Dodd, Ralph Kennon, Leslie R. Martin, William F. Poorman, Hudson J. Stowe. Regrettably indeed, two of these, Messrs. Gunn and Porter, have since been removed by death.

Table II:

Entrance Into Society of Actuaries

1949	41	1966	120
1950	34	1967	110
1951	34	1968	122
1952	38	1969	140
1953	27	1970	139
1954	41	1971	162
1955	41	1972	149
1956	47	1973	156
1957	46	1974	147
1958	50	1975	217
1959	61	1976	392
1960	60	1977	333
1961	55	1978	313
1962	73	1979	276
1963	72	1980	411
1964	60	1981	265
1965	77		
		1949-1981	4,309
		1919-1948	337
		All Fellows	4,646

The first quartile of this total array is in year of entry 1965; the median is in 1974; the third quartile is in 1978. New Fellows of 1973 may be surprised to learn that you are now, relatively speaking, oldtimers.

Next month we will report on Associates' seniority spread.

E.J.M.

Table II

CPI-ADJUSTED INCOME AND EXPENSE

(Amounts in Thousands)

	1958-59	1968-69	1980-81	Budget 1981-82
Adjustment Factor	1.00	1.234	3.012	3.3 Est.
Income				
Membership Dues	$ 44 M	103	266	281
Seminars			62	106
Meetings	1	32	88	92
Exam Fees	26	88	275	274
Publications	32	43	45	29
Investment Income	5	9	44	38
Other Income	15	28	136	132
Total Income	123	303	916	952
Expenses (By Cost Center)				
Seminars			69	105
Meetings			87	92
Examinations		(Figures by	350	306
Public Information		Cost Center	15	19
Research Services		Not	1	34
Other Memb. Services		Available)	290	304
Gen. & Administrative			94	91
Total Expense	114	317	906	951
Income Less Expense	+ 9	− 14	+ 10	+ 1
Statistics				
Number of Members	1,822	3,275	7,697	8,447
Dues per Fellow ($)	30	41	43	44
Expense per Member ($)	60	97	118	112
Equity per Member ($) (Funds on hand)	143	62	22	18

Education and Training

(*Continued from page 1*)

fuss about education"—Melbourne (No question raised here).

2.4 *Admission standards*

"Abandon all hope, you who enter!" —Dante

A table here shows that, of a typical cohort of new students, after 5 years, 45% have dropped out, 17% have qualified; after 10 years, 55% have dropped out, 32% have qualified; after 15 years, 60% have dropped out, 35% have qualified. and 5% are still sitting for examinations.

Ques.: Should the selection criteria for entry to the profession be made tougher?

Ques.: Should the entry requirements include some sort of aptitude test to identify those attributes which may not be associated with academic qualifications alone?

2.5 *The subjects to be examined*

"This'll sort out the men from the boys"—Sports commentator

Ques.: Is the present course of study too extended; and consequently should the content of the examination syllabus be reduced? If so, how?

Ques.: Should there be a qualification to recognise formally the status of 'actuarial technician'?

2.6 *The role of post-qualification education*

"It is melancholy truth that even great men have their poor relations" —Dickens

Ques.: Should more resources of manpower be diverted into post-qualification education?

Ques.: Does the structure of post-qualification courses need to be strengthened and expanded?

Ques.: Should there be some element of compulsion to participate in post-qualification education (e.g., as a condition of being allowed to sign actuarial certificates)?

2.7 *Limitations on examination attempts*

"To spend too much time in studies is sloth"—Bacon

Ques.: Should there be a limitation on the number of examination attempts, or on the time allowed to pass part or all of the examinations?

2.8 *The decision-making structure*

"Grant unto her whole Council and to all that are put in authority under her, that they may truly and indifferently minister justice"—Book of Common Prayer

This is a descriptive section, giving a chart of the Institute E. & E. structure.

3. Implementation

3.1 *The relationship with policy*

Introductory.

3.2 *The form of the examinations*

"Examinations are formidable even to the best prepared, for the greatest fool may ask more than the wisest man can answer."—Colton

Ques.: Should the examinations be augmented by some form of continuous assessment?

Ques.: Is there a case for relaxation of the fixed time limits for completing the examination papers?

Ques.: Should candidates be allowed some choice of questions in the exam papers?

Ques.: Should we reconsider the frequency at which examinations are held?

Ques.: Is it necessary to revise the course of reading every year?

3.3 *Examination standards*

"To be, or not to be: that is the question"—Shakespeare

Among the statistics in this section is a showing that the proportion of candidates who pass a Part declines with repeated attempts.

Ques.: Would the excellence (of the profession's reputation) be significantly diminished if there were some relaxation of the examination pass standard?

Ques.: To assist students who lack practical experience in particular subjects, should the subjects in the later Parts be examined at a two-level option (ordinary and advanced)?

3.4 *The role of the examiners*

"The quality of mercy is not strain'd, . . . It blesseth him that gives and him that takes"—Shakespeare

Ques.: Is there support for the suggestion that the examiners should publish at least outline notes of guideline solutions to the examination questions?

Ques.: Should the examiners make marked examination scripts available to failed candidates (direct or via their tutors); on the understanding that there would be no question of their being used to challenge the marking?

3.5 *Tuition: the choice of methods*

"Example is always more efficacious than precept"—Samuel Johnson

Ques.: Should the Tuition Service continue to develop the provision of various forms of class teaching as a more effective form of tuition than correspondence courses alone?

(From here on, some subjects and questions not applicable to the Society's system are omitted from this synopsis).

3.7 *Tuition: the students*

"Hope springs eternal"—Pope

Ques.: Does the time-honoured philosophy of part-time study any longer provide the best approach to the education and training of actuarial students? If Yes, do we need a more controlled and disciplined system of tuition? If No, should we develop and expand a tuition system based, at least in part, on full-time study (e.g., university courses in actuarial science)?

3.11 *Manpower*

"Never in the field of human conflict was so much owed by so many to so few"—Churchill

Ques.: How can we use the limited resources of (educational) manpower to be most cost-effective, in terms of the performance of the system in providing trained and qualified actuaries?

Ques.: How can we best use outside professional teaching to assist and to release our own limited resources for educational work outside the examination system?

And this thought-provoking analysis ends with Churchill again: "This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."

E.J.M.

LETTERS

Faux Pas

Sir:

You misquoted me in "Beneficiaries of Inflation" (Jan. issue).

As the ratio of income to capital stock has been on the uptrend, the implication is that the capital stock isn't worth as much. Both labor and capital lose, but labor loses less. Capital is by no means a winner when unanticipated inflation exceeds anticipated inflation.

Larry Bartlett

Ed. Note: Blame for this is accepted by our well meaning but bumbling assistant, Ms. Mia Culpa.

Immunization

(*Continued from page 4*)

rates change. If we have three investments with different durations, we can take some combination of any two of them to get the same duration as the third. This is true even if the investments themselves are complex, as are bonds or even cash flows from portfolios of insurance policies. Even the profound developments of immunization are based upon the simple principle of our illustration.

Purists may say that our illustration doesn't hold water because interest rates aren't flat by duration, and there aren't the parallel interest rates pictured in the illustration. If such were so, there'd be a sure way to make money without taking any risk. The fact is that several studies, unpublished but carefully conducted, have shown that immunization works—not perfectly but very well indeed. In addition, there is a reason why interest rates move in parallels—inflation. Although the way in which inflation enters into interest rates seems not to be stable, the current rate of inflation does affect rates for all maturities in a similar way.

I hope this is of help to readers whose interest in the immunization idea has been dimmed by the complex mathematics involved.

Now, is that all clear? Why are your eyes closed? Wake up! Wake up!

Ed. Note: Some references given us by Mr. Vanderhoof will be printed in our May issue. □

We Aren't Doing Our Job

Sir:

Your January 1982 issue contained more than one message that life insurance stands in need of being made safer. Charles F. B. Richardson repeated his excellent advice of 40 years ago, and Frank M. Redington described his 1952 exploration of immunization. In intervening years neither of these problems has gone away, and competition has resulted in smaller and smaller levels of contingency reserves.

Competitive pressures remove any hope that the life insurance industry will voluntarily increase the prices of its products in order to solve such problems as these—which is, to some extent at least, a reflection on our profession.

Too few actuaries have resigned in public protest against top management's short range attitude. Too many actuaries have allowed ourselves to be outwitted by agency officers, who are apt to be good communicators to management while most of us are incurable introverts. Top management itself seems mostly interested in short range results anyhow.

Although philosophically uncomfortable about advocating more regulation, I believe our industry needs outside regulation to overcome its demonstrated inattention to long range safety, the very heart and soul of life insurance.

Stuart J. Kingston

* * * *

Rollercoaster

Sir:

J. Bruce MacDonald's memorable afternoon (October 1981 issue) prompts me to relate an experience of my own.

Most students have learned what it's like to get exam results by phone, and I agree that's not the ideal way. I called a Chicago number (not the Society's) last July and was told that my candidate number was not on the Part 10 pass list. Since Part 10 was my only remaining obstacle to fellowship, I felt demolished—but elated when the next day's mail brought news that I had passed.

What an emotional rollercoaster!

Steven D. Bryson

* * * *

Who Should Pay For What?

Sir:

As an E. & E. Committee member, I think it important to bring out two points about Society finances (R. J. Johansen, Dec. 1981 issue).

The first is evidenced by the numbers themselves. The cost of setting and administering our examinations is rising faster than our income from them, resulting in a subsidy of the examination process from members' fees. While it's true that we all benefit from bringing in new members, shouldn't our dues be routed more toward publicizing the profession and lobbying to improve its position in our countries' economic market? The cost of examinations should be met by the fees we charge for them.

The second point can't be seen on Mr. Johansen's chart, but reflects a similar condition. We who serve the examination process are expected to subsidize our own expenses by sharing hotel rooms —an annoying requirement often discussed at our meetings. The costs of setting and marking examinations should be borne by the students and their employers, not absorbed by those who contribute time and effort to make this whole thing work. *Leslie J. Lohmann*

Mr. Johansen replies: The Society is well aware of, and appreciates, the efforts of the E. & E. Committee members. Nevertheless, a partial subsidy of exam costs has been continued in order not to discourage the prospective actuaries we need from attempting our examinations.

* * * *

Intrinsicality

Sir:

Stuart J. Kingston (Nov. 1981 issue) said that high taxes are intrinsically unethical. The fact is that Federal taxes taken from our citizens are all paid back to us; in fact, President Reagan has arranged to pay back about $100 billion more this year than the government will receive. This can be called unethical only if the war industries and poor people who get it need it less than does the taxpayer; or do less good with it; or deserve it less.

Such terms being undefinable, there never can be consensus on ethicality. Hence, taxes are not intrinsically unethical; saying so merely warns people of the biassed position from which one comes. *Charles M. Larson*

THE 1983 TABLE *a*

by Robert J. Johansen

Ed. Note: This is the first of three articles about the new Table a that is scheduled for adoption by the NAIC in June 1982.

The Society's Committee to Recommend a New Mortality Basis for Individual Annuity Valuation, formed in 1980 at NAIC request, began by examining an advance copy of the 1971-76 individual annuity and settlement option experience, and concluded (i) that the margins in the 1971 IAM Table (*TSA XXIII*, 496) had eroded, making that table unsuitable for the 1980's; (ii) that because of the pattern of mortality decline by age, an age set-back wouldn't do; and (iii) the new valuation laws permitting higher rates of interest would remove interest rate margins that might otherwise offset inadequate mortality margins.

The 1973 Experience Table

The first step was to construct an experience table, using the best and most recent data. The Committee determined that it, like the 1963 Experience Table (ibid., 490), should be based on the total of immediate annuities, settlement options and matured deferred annuities (but excluding pension trust business), and should reflect all years of issue; we felt that a valuation table should be designed to be adequate in the aggregate for a typical mix of business such as the 1971-76 study appears to contain. And we decided to construct separate tables for men and women, no one male/female ratio being appropriate for every company.

Crude 1973 mortality rates were derived from the Intercompany 1971-76 Study by applying ratios of actual to expected deaths by five-age groups to the 1971 IAM q_x at the central ages. In the absence of useable mortality experience at ages below 48, the 10 percent loading was removed from the 1971 IAM rates and the resulting q's were connected to those at higher ages by use of a cubic. Finally, the rates were graduated by a Jenkins 5th difference osculatory formula.

Closeness of Fit

The table below, showing how well the 1973 Experience Table fits the underlying data at selected groups and all ages combined, also serves as a warning that it—and hence also the 1983 Table *a*—is not representative of the experience under different kinds of annuities.

FOR YOUR READING

William R. Waters: *Employer Pension Plan Membership and Household Wealth*, pp. 110.

From a sample of Canadian households, Prof. Waters has gathered data on the tendency for pension plan participants to reduce other forms of saving. He concludes that they do so to the tune of between 50% and 100% of the household's pension contributions. This is Monograph 10 (1981) of the S. S. Huebner Foundation for Insurance Education. Available from Richard D. Irwin Inc., 1818 Ridge Road, Homewood, IL 60430. $US 14.95.

Robert J. Myers: *Indexation of Benefit Computations In National Pension Scheme of United States of America*, pp. 14 in typescript.

This was a contribution to the proceedings of the VIIth (1979) International Conference of Social Security Actuaries and Statisticians, Mexico, an event sponsored by the International Social Security Association, Geneva. Deals historically with the ill-fated automatic-adjustment provisions of our 1972 Amendments, the subsequent wage-indexing vs. price-indexing debate, and the indexing procedure in the 1977 Amendments. Mr. Myers kindly volunteers a gratis copy to readers who request it to him at 9610 Wire Ave., Silver Spring, MD 20901.

Social Security Administration: *Actuarial Notes Nos.* 102-110.

Our space difficulties have made this newsletter remiss about telling our readers about Actuarial Notes available gratis from Office of the Actuary, Social Security Administration, Altmeyer Bldg., Room 707, Baltimore, MD 21235. Titles are:

No. 102. A Comparison of Social Security Taxes and Federal Income Taxes.

No. 103. Average Wages for Indexing and the Automatic Determinations for 1979-81.

No. 104. A Comparison of Retirement Benefits Under the U.S. and Canadian Systems.

No. 105. Equivalent Retirement Ages: 1940-2050.

No. 106. Comparison of Actual Economic Experience and Assumptions in Trustees Reports 1971-1980.

No. 107. Were Benefits Under the Original Program on an Individual-Equity Basis?

No. 108. Long-Range Projection of Average Benefits Under OASDI.

No. 109. Economic Forecasting: Effect of Errors on OASDI Fund Ratios.

No. 110. Costs of The System Over The Years Compared With Those Estimated in 1935.

Also published has been Actuarial Study No. 86, *Effects of the Various Social Security Benefit Computation Procedures.*

Our apologies to the fine SSA actuarial staff for the delay in reporting these essays and for this summary treatment of them. □

Ratios of Actual Deaths to Those Expected on the 1973 Experience Table

Selected	Immediate Nonrefund		Immediate Refund		Matured Deferred		Settlement Option		All	
Ages	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
65-69	150%	106	97	114	97	92	97	103	99	104
70-79	115	94	94	96	97	102	104	102	101	100
80-89	82	87	92	97	106	107	109	101	100	99
90 & over	91	92	98	105	109	104	104	99	99	100
All ages	96	90	95	100	102	105	105	103	101	101