The Actuary
The Newsletter of the Society of Actuaries
VOL. 20, No. 1 January, 1986

THE SOCIETY'S SECTIONS

Beginning with the November 1984 issue, *The Actuary* has presented a series of articles by the Society's officers and emphasizing their duties and responsibilities. This series has been under the direction of Julius Vogel, until very recently an Associate Editor, but now retiring. *The Actuary* takes this opportunity to thank Julius for this and other contributions to this newsletter.

There have been articles from the Vice-Presidents, the Secretary, the Treasurer, and the Director of Publications. Within this same series there have been stories from the Health Section (January) and the Product Development Section (May). *The Actuary* intends to continue the series into 1986, but its future emphasis will be upon the fast developing Section structure. It seems clear that more and more of the Society's affairs, especially in the area of continuing education, will be undertaken by the Sections.

At the present there are seven Sections, each with its own Section Council and officers. All of these Sections have some kind of newsletter, with an editor (not always a Council member) in charge. Each Section holds elections for its nine Council members, serving staggered three-year terms.

At the Society level, one of the Vice-Presidents is directly responsible for the Section activity, and one of the staff is directly responsible for Section support.

During 1986 *The Actuary* hopes to carry articles on each of the five Sections not already featured. In this issue we recognize the seven Sections by publishing their Councils, officers, and editors for 1986 (see page 4).

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YOU SHOULD LIVE SO LONG

By Murray Projector

Editor's Note: Mr. Projector writes that this item was suggested by Solomon Goldfinger's study of "A Stationary Population Problem in the Bible" (September). He does not explain, however, why "You Should Live So Long" bears a date of May 9, 1977.

"The days of our years are
three-score years and ten,
Or even by reason of strength
four-score years;"

These lines from Psalms 90.10, Masoretic text, are very much applicable to current mortality experience.

If we interpret "days of our years" as meaning life expectancy at birth, the psalmist is stating that life expectancy at birth is between 70 and 80 years.

For developed countries, life expectancy at birth is in this age 70–80 band. Current U.S. Life Tables, for example, show a life expectancy at birth (total males and females) of about 72 years.

Life expectancy is a measure of average lifetime, not a prediction of how long one person will live. About half of the population lives more than the numerical life expectancy value, about half lives less.

The life expectancy value is not a measure of maximum lifetime, but is a measure of "middle lifetime." Only in recent times has this middle value come up to the 70–80 year range.

What of maximum lifetime? If 70–80 represents the current population average, what is the current population maximum? 100?, 110?, 120?, 130?, 140?, 150?.

The conventional wisdom of the 19th century included many instances of death at very advanced ages, such as 130, 140, 150 and still older. Contem-

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ACTUARIAL MEMORABILIA

By E.J. Moorhead

Historians and archeologists complete only the less interesting, less helpful part of their task if they merely recite their findings. They must try to tell why events occurred as they did, what kinds of people helped or hindered their happening, amidst what conditions they unfolded.

For example, English historian Dame Veronica Wedgwood in her fascinating 1984 work, *The Spoils of Time,* does not write:

> In 55 BC, Julius Caesar made explorations into Britain, defeating the Britons a year later.

No, she gives her readers perspective by telling them:

> "Two unnecessary and mismanaged expeditions against the island of Britain added nothing to Caesar's reputation but received disproportionate attention in later times because the first certain and recorded date in the history of the island — 55 BC — can be deduced from his *Commentaries.*"

That documents saved from the past are essential to putting flesh upon the bones of history need hardly be said. Yet as the years go by, far too many letters, booklets, memoranda and newsclippings are accidentally or thoughtlessly destroyed. Fire and flood are sometimes responsible, but much more often destruction-of-records programs, company moves, and passing of ownership from those who have appreciated their value to those who begrudge even the space they occupy are the culprits.

Our Society's Executive Committee, eyes fixed on the hundredth anniversary celebrations less than four years ahead, tackled this matter of preserving and ex-

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The Actuary

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

EDITORIAL

The start of a new year is the natural time to become introspective, to pause, sit-back, reflect, and take stock. Since Acting Editors with fresh ideas had full responsibility for the last two issues of the old year, January is an especially appropriate time for *The Actuary* to raise two related questions: What is the editor's job? How can he do it better?

Perhaps we start an answer to the first question by clearing away the chaff. The editor does *not* wield a blue-pencil, nor does he spend much time with re-writing, proof-reading, make-up, or typography. The editor has responsibility as to each of these matters, and he does some small part of each; but his small but experienced staff handles most details, while the editor directs his energies elsewhere.

The primary concern is the *collection* of a wide range of quality editorial material, and the appropriate *selection* therefrom. The selection task becomes easy when there is sufficient good material — hence the real challenge lies in collection. We need articles, features, announcements, and letters that readers find informative, useful, interesting, and enjoyable. We need solid or heavy material, and light. We need problems, jokes, puzzles. We need controversy (though not too much). We need the past, the present, and the future.

Sometimes collection involves no more than finding items already written, and the gaining of publication rights. More often initiative is required. Planting the seed, encouraging its growth, and reaping the harvest, all through the work of others, is often what collection means.

As in other journalistic endeavor, the key is the "source" — the individual who has something worthwhile to say, and the willingness to put it into writing. Creating or cultivating productive sources must be the editor's main objective. He needs sources in all of several areas of actuarial interest, and he needs sources with differing points of view.

Deborah and Stuart have already shown us one way to improve. We can broaden our perspective by tapping non-actuarial sources. Deborah's issue carried articles by an agent and an underwriter, whose views of the actuarial profession are from the outside. Stuart's December issue has an interesting reprint from *Forbes*. It takes imagination and foresight to bring such view-points to our attention.

Looking at our recent past may give us some perspective. Have we had too many items from too few sources? Do we give too much emphasis to certain topics? Do we hear too little (or too much) from any sub-group?

We now ask for our readers' suggestions. What sources have we overlooked? What stories have not yet been written? What new ideas need exploration? In short, how can we do it better?

C.L.T.

MATHEMATICAL OLYMPIAD

The September and October issues of this newsletter included stories on an international contest for high school mathematics students. One problem of the six that all contestants were asked to solve was presented as a part of the September article, while another was posed in October. We suggested that at least some actuaries might enjoy trying their own hand at solving these problems. There has now been time enough that we have some replies.

The only solution to the September number theory problem so far received comes from David DuBois. While he shows his mathematical skills by developing a fine answer within the allotted time, David gets lower grades as a forecaster. In a post-script he states that "I wouldn't be surprised if you get over a 100 of these proofs." How far off can one be?

The October plane geometry problem was considerably easier, at least for the contestants, and presumably for actuaries. Mark Fowler, Graham Lord, Seymour Rubenstein and Paulette Tino have, by late November, sent in 100% solutions. Three of these involve geometry only, while two use trigonometry as well. For those perplexed by reference to five solutions from four actuaries, we explain that one solver presented one solution of each type.

In a reply of a different type, Manuel Gelles asked for more information. He wants the scores of all of the 30 countries competing, in order to rise to the challenge of explaining why communist countries took five of the first six places. *The Actuary* has the information, but with the countries designated by only a two-letter code, not entirely obvious to North American readers.

AT	77	GR	69
AU	117	HU	168
BE	60	IL	81
BG	165	MA	60
BR	83	MN	62
CA	105	NL	72
CO	54	NO	34
CS	105	PL	101
CU	74	RO	201
DD	136	SE	65
DE	139	SU	140
DZ	36	TR	54
FI	25	US	180
FR	126	VN	144
GB	121	YU	68

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You Should Live So Long

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orary conventional wisdom, with greater respect for documented proof of age, does acknowledge thousands of centenarians, but a scant few reaching 110, and maybe one in a hundred million, if any, reaching 120.

If we need to identify a maximum possible age, 120 is a reasonable choice. Some mortality tables, which are mathematical models of longevity, do extend to ages 110 or higher, but none reaches 120.

> *"And the Lord said: 'My spirit shall not abide in man for ever, for that he also is flesh; therefore shall his days be a hundred and twenty years.'"*

The above lines are from Genesis 6.3, again from the Masoretic text. The obvious interpretation is that 120 years is the maximum (omega), and not the average lifetime.

Thus we have a plausible reconciliation of Psalm 90.10 (70–80 years) with Genesis 6.3 (120 years). The 70–80 years average means pre-destination for large numbers, whereas 120 years is pre-destination for each individual. □

Mathematical Olympiad

(Continued from page 2)

We now leave it to Mr. Gelles, or to any other reader, to decipher this code, and to come up with the explanation.

Having not quite decided as to the strength of reader interest, we here present still another of the Olympiad questions. Second easiest overall, and second easiest for the U.S. team, was this problem in set theory:

Let n and k be given relatively prime natural numbers, $0<k<n$. Each number in the set $M=\{1, 2, \ldots, n-1\}$ is coloured either blue or white.

It is given that

(i) for each $i \in M$, both i and n–i have the same colour, and

(ii) for each $i \in M$, $i \neq k$, both i and $|i-k|$ have the same colour.

Prove that all numbers in M must have the same colour.

One further question occurs to *The Actuary*. What is the relationship between the spelling of the word "colour" and the observed fact that the Canadian team scored a perfect 42 on this one question? □

Deaths

Neil W. MacIntyre	FSA 1946
Earl M. MacRae	FSA 1941
William F. Marples	ASA 1950
Eugene H. Neuschwander	FSA 1931
Donald J. van Keuren	FSA 1948

Actuarial Memorabilia

(Continued from page 1)

hibiting our professional records at their meeting last August. The minutes read:

> It was suggested that with the 100th anniversary of the actuarial profession in North America being celebrated in 1989 it would be appropriate to display various items of historical nature, for example, pictures from early actuarial meetings, books (other than the *Transactions, Records,* etc.) or any kind of memorabilia.

Many such items are lodged at Society headquarters, as this writer can attest from two fruitful visits. And kind friends have entrusted others in response to my enquiries. but there's a great deal out there in the files of individual actuaries and in company archives and libraries that we need to know about.

Here, just to give an idea of the range of items that an actuarial body can bring together on an occasion such as we shall have in 1989, is a greatly shortened list of the exhibits displayed in London in 1948 at the centenary of the Institute of Actuaries:

> Works of John Napier, John Graunt, Isaac Newton, Edmund Halley, Abraham de Moivre, Thomas Simpson, James Dodson, Thomas Bayes, Richard Price, William Morgan, George Barrett, John Heysham, Francis Baily, Joshua Milne, Benjamin Gompertz, Griffith Davies, John Finlaison and Augustus de Morgan.
>
> The Institute's charter, portraits of its presidents, minutes of early meetings of the Institute and of its Council, the first paper delivered by a charter member, the first life contingencies text-book, busts of various leading members, gold medals long ago presented to distinguished members, honour rolls from two world wars, book containing its hundred-year history, and a message received from the Actuarial Society of America and the American Institute of Actuaries at the end of the second war.
>
> Several photographs of the offices of the Institute at Chatham Place and Staple Inn. (Staple Inn Hall had been destroyed by a flying bomb in 1944).
>
> Documents from early bodies intimately connected to actuarial history: The Actuaries' Club, The Amicable Society and The Equitable Life Assurance Society.
>
> Early calculating machines: Japanese abacus, arithmometer, comptometer, Babbage's analytical engine, Vannevar Bush's differential analyser, Ohdner's arithmometer.

It's true that we in North America have not the history behind us that the Institute had. On the other hand, we have not been subjected to heavy wartime bombing as Great Britain has.

Many members will easily remember the fine exhibits displayed at our celebration at New Orleans in 1974. They are described in Vol. XXVI of our *Transactions* starting at page D385. Much of this material is in boxes at our headquarters.

Those who have historical material in your homes or offices, no matter how trivial it may seem to you, are cordially invited to tell E.J. Moorhead about it at my *Yearbook* address. □

1985 ACTUARIAL SCHOLARSHIPS

The Subcommittee on Minority Recruiting is pleased to announce the recipients of the scholarships awarded in 1985:

Engel, Wendy Jan	Georgia State
Jonk, Heidi Marie	Smith College
Kinlow, Tonya	Pennsylvania
Na, Sun Hwa	Georgia State
Powell, Victor Tyrone	Howard
Powell, Tracey Ann	Howard
Sheppard, Traci	Howard

In addition to these scholarships, the Subcommittee has been providing financial support to the Howard University Summer Actuarial Program. This program invites the top high school math students from across the nation to spend three weeks getting to know more about the profession and actuarial work in general. Over a dozen actuaries have made presentations or participated in this year's summer program.

Since 1977, the Society of Actuaries and the Casualty Actuarial Society have sponsored a Minority Recruiting Program to encourage qualified minority students to seek careers within the actuarial profession. The Minority Recruiting Program receives its financial support from contributions by actuaries and employers of actuaries throughout the United States. In addition to awards from the general scholarship fund, the program offers scholarships from three separate funds that have been established by individual companies. The Equitable Life Assurance Society has established the J. Henry Smith Fund for Women and Minority Graduate Students and two funds have been established by the CIGNA Corporation (one for graduate students and one for undergraduates).

Each year, application forms and posters that describe the program are distributed to approximately 150 colleges and universities throughout the U.S. Of the former scholarship recipients from the various funds, we are proud to announce seven are now FSAs and seven more are ASAs.

In its efforts to reach qualified candidates, this Subcommittee has produced a booklet which contains comments and career profiles of some of our minority actuaries. This booklet is available on request from the Society's Office.

We strongly urge the general membership to publicize the existence of this program as part of the overall effort to attract and encourage more people to join our profession. □

SECTION COUNCIL DIRECTORY
Section Councils and Editors for 1986

FINANCIAL REPORTING	Term Expires
Kenneth T. Clark	1987
Arnold A. Dicke	1988
Richard K. Kischuk	1986
Horace W. McCubbin	1986
Richard S. Miller (S)	1988
Henry B. Ramsey, Jr.	1987
Wm. J. Schreiner (C)(E)	1987
Steven A. Smith (T)	1986
Robert W. Stein (VC)	1988

FUTURISM	Term Expires
Robert L. Collett	1987
Michael J. Cowell	1988
Richard S. Foster	1988
Dale C. Griffin	1986
Barry S. Halpern (C)	1987
Fred W. Kilbourne (VC)	1986
Warren R. Luckner (S)(T)	1986
James J. Murphy	1988
David S. Williams (E)	
Robert E. Williams	1987

HEALTH	Term Expires
Howard J. Bolnick	1988
J. Martin Dickler	1987
Robert H. Dobson (T)	1986
Phyllis Doran	1988
Ted L. Dunn	1988
Robert J. Dymowski (VC)	1987
Charles Habeck (E)	
Charles W. Kraushaar (S)	1986
Donald M. Peterson (C)	1986
Kurt K. VonSchilling	1987

NON-TRADITIONAL MKTG	Term Expires
Roberta L. Canfield (T)	1986
Kiran Desai	1987
Jay M. Jaffe	1987
H. Neil Lund (S)(E)	1988
Harry Ploss	1987
H. Michael Shumrak (C)	1988
Fred M. Singer	1988
Maria N. Thomson (VC)	1986
David D. Vrla	1986

PENSION	Term Expires
Shiraz Bharmal	1988
Raymond Cole	1986
Charles Farr (C)	1987
Yves G. Guerard	1987
David A. Hilbrink (E)	
Russell Mueller	1988
Leroy B. Parks, Jr. (VC)	1987
William D. Smith (T)	1986
Charles Trowbridge	1986
Howard Young (S)	1988

PRODUCT DEVELOPMENT	Term Expires
H. David Allen	1987
Allen D. Booth	1988
William Carroll (C)	1986
Stephen Frankel (S)	1986
Richard W. Kling (E)	
Randall Mire	1987
Alice M. Neenan	1986
John J. Palmer (VC)	1987
J. Lynn Peabody (T)	1988
Cathy H. Waldhauser	1988

REINSURANCE	Term Expires
Johanna B. Becker (T)	1987
Wayne D. Bidelman	1988
Denise Fagerberg (S)	1987
Robert P. Johnson	1986
Denis W. Loring (VC)	1987
Peter B. Patterson	1986
Michael R. Winn (C)(E)	1986
Eugene M. Woodard	1988
John B. Yanko	1988

C – Chairman
VC – Vice Chairman
S – Secretary
T – Treasurer
E – Newsletter editor, no date indicates not a council member

ACTUARIAL DEMOGRAPHICS I

By Dwight K. Bartlett, III

Since 1985 was the silver anniversary of the class of 1960 FSA's, it seems appropriate to review what has happened in the past 25 years to these 60 men and one woman who were members of that class. The following is based on information largely determined from the 1961 and 1985 Society of Actuaries' *Yearbook*.

In 1961 and in 1985 the distribution by type of employer is as shown in the following table:

	1961	1985
Academia	1	1
Consulting Actuaries	8	23
Government	0	1
Life Insurance	52	28
Retirees	0	4
Resignations	0	2
Deaths	0	2
	61	61

Noteworthy are the following: Eighteen still work for the same employer, a high degree of employment stability; paralleling what is happening in the profession generally, the shift to the consulting sector is quite strong; normal mortality expectations would call for three or four deaths, so we have apparently been a healthy bunch; the 53 of us still in active employment can only envy the four retirees; during the next decade, presumably most of us will move into that category.

The following table shows the distribution of those employed by life insurance companies according to title.

Presidents	4
Executive Vice Presidents	4
Senior Vice Presidents	4
Vice Presidents	9
Assistant Vice Presidents	2
Other	5
	28

Apparently we are a talented and hard-working bunch. It is more difficult to determine status by title in the consulting industry, but it should be noted that ten of the 23 employed as consultants work for firms whose name incorporates their own name. Obviously we have our share of entrepreneurial types who dislike working for other people.

The following table indicates the geographical distribution of class members of 1961 and 1985:

	1961	1985
Canada	8	9
Central	11	6
Northeast	32	27
South	7	10
West	3	5

Actuaries, like the rest of our population, have been attracted by the comforts of life in the sunbelt regions of the South and West. On the other hand the strong pattern of net migration from Canada to the United States, which took place in the years following the Second World War, apparently had pretty much died out by 1961.

Normally 50% of a normal American population have an initial of their last name falling in the range A through K and the balance L through Z. For some strange reason, in our class 40 of the 61 fall in the range of A through K. Does anyone have a theory explaining that statistical oddity? □

ACTUARIAL DEMOGRAPHICS II

By—Preston Bassett '36
Stanley Olds '42
Linden Cole '51
Bob Hardin '59
Gary Dahlman '60
Forrest Richen '62
Kathleen Burt '69

Can you imagine a large U.S. city more remote from the major centers of the insurance business than Portland, Ore.? Yet, Grant High School, just one of the several high schools in that city, has produced at least seven actuaries since 1936.

Grant is not a technical school; neither its curriculum nor its middle class neighborhood suggests a fruitful source of actuaries. Nevertheless, given at most 500 graduates a year on the average from 1936 to 1975 (a reasonable cutoff year considering the "travel time" from high school graduation to FSA), the production rate exceeds 0.35 FSA's per 1,000 graduates. The comparable figure for the nation is surely less than 0.06 FSA's per 1,000 graduates, (5,208 FSA's on 11/1/84 divided by a conservative estimate of surviving high school graduates from that period of about 91 million).

While we don't think our group is large enough to form an SOA section, we are proud of our high school and would like other Grant High School graduates to identify themselves. Moreover, we challenge other high schools to match our record. Can we learn something from Grant and other productive high schools about how to recruit future actuaries? □

SHORT COURSE ON ACTUARIAL MATHEMATICS

By Abdul Hoque

The American Mathematical Society (AMS), in conjunction with its eighty-ninth summer meeting, presented a one-and-one-half day short course entitled "Actuarial Mathematics" on Aug. 10 and 11, at the University of Wyoming, Laramie. The course was one of a series given by the Society on the recommendation of its Committee on Employment and Educational Policy (CEEP). As a student participant, I think it was a successful short course for a research oriented actuary. Also, it was a good opportunity for professional actuaries to exchange research ideas with the academic actuary doing teaching and research. I am writing this report for those members who were unable to attend the course, and to give an outline of the materials presented in the meeting.

In the introduction, James C. Hickman (University of Wisconsin) introduced himself and all other guest speakers. His lecture introduced actuarial mathematics as a branch of applied mathematics devoted to building models of insurance systems. It is an old and successful application of mathematics in business and social sciences. He explained how actuarial models incorporate mathematics of life contingencies, which is the study of models used in life insurance and annuities. He also explained how expense and compensating premium loading can be added to the loss variable, and how the equivalence principle, that is, the expected present value of future losses, defines current liability, yields premiums and reserves. Indexed benefit and random interest concepts were explained with examples.

After Professor Hickman, Harry H. Panjer (University of Waterloo) presented his lecture on Models in Risk

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LETTERS

Symposium

Sir:

The recent Symposium on "The Valuation Actuary" was an unqualified success. The efforts of the faculty and staff are to be highly commended! I am writing this letter to expand on a dialogue that was started during those presentations, but for which additional discussion time was not available. *The Actuary* might be a good forum for my remarks.

The period of time over which the various cash flow scenarios should be projected by the Valuation Actuary did not receive a great deal of discussion. Those presenting examples tended to use 20 years as a convenient period, and some observed that a longer period should be used when the amounts remaining after 20 years were significant. Many seemed to agree with the latter position, even though they acknowledged that longer projections would further complicate the already onerous process of multi-scenario testing. I would like to suggest another line of reasoning that has led me to the opposite conclusion.

First, we must look at two key characteristics of the projections we are proposing:

1. While static at the time they are made, the projections should really be reviewed as dynamic — they will be recalculated each year (or more frequently), and there will be no "lock-in" principle with regard to assumptions such as applied to GAAP, and . . .
2. the projections will ignore future issues.

The implication of the dynamic view of our projections, simply stated, is that we will approach that elusive 20th year value asymptotically. Each year we will re-project cash flows based on a new view of what may happen in the future, reflecting updated experience. Management will have ample time over that period to take corrective action to overcome any emerging adverse experience.

The primary argument advanced for using longer projection periods was the potential for significant amounts of business remaining in force after 20 years. However, in this sense, "significant" has been measured against the size of the original block of business 20 years earlier. When 20 years of new business are included, it is difficult to see that any short-fall in the 20-year-old block would be material to the total company's surplus position.

From these points, I conclude that we could view 20 years as the normal, if not the maximum, projection period. Indeed, I can envision circumstances where periods as short as 10 years might be sufficient for a Valuation Actuary to accept as the basis for an informed opinion. Conversely, circumstances suggesting there will be little or no future business might require longer projections, but I consider this unlikely.

As a final thought, I can see merit to a "fail-safe" type of test that could be applied when short projection periods are used and/or small or negative surplus margins appear in early years. (It also might have some general applications.) This would consist of a few projections for a period of two or three years using assumptions which might be described as "worst plausible". This could act as an early warning to management, identifying the magnitude of adverse experience which would require early and/or severe corrective action.

Robert H. Dreyer

****

Model Law

Sir:

The Model Standard Nonforfeiture Law as of 1980 has an interesting puzzle for those actuaries interested in puzzles and who would not mind spending a few hours (or days or weeks) in trying to find out how to apply the Model.

An especially interesting section attempts to limit cash values discontinuities, specifically section 10164.1 of the California Code and Section 8 of the Model. In discussions I have found few actuaries who have an interpretation, a few have a general explanation of the intent of the Section, and I must confess to a complete loss as to what the Sections means and how to apply it.

Do any readers have any specific approaches to use to determine whether a schedule of cash values complies with the requirements?

John T. Gilchris

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Short Course on Actuarial Mathematics

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theory. He gave a good mathematical view of the modeling of claims for an aggregation of risks. Theoretical justifications of the choices of models using concepts of mixing and compounding were given. Numberical examples for evaluation of total claims were presented.

Stuart A. Klugman (University of Iowa) explained how loss distribution comes into play in analyzing risks. He demonstrated that knowing the mean of the loss distribution is not significant. He then explained five methods of Parameter Estimation and concluded his lecture with the development of confidence intervals for those estimates.

Then P.M. Kahn gave a lecture on credibility theory. Basically Mr. Kahn gave a good overview of the literature.

E.S. Shiu then delivered a lively lecture on Graduation theory. He touched mainly on recent developments on the topic including Bayesian Graduation.

Finally, John A. Beekman (Ball State University) discussed Population Projections, and Dependency Ratio. He also talked about Economic Assumptions for Social Security projection and long range cost estimates for the OASDI system.

In my opinion, the course was fruitful and the seminar and discussions were lively. I think the Society should arrange similar workshops in the future to encourage more theoretical research.

An Even Shorter Course

A two-session minicourse entitled "Introduction to Actuarial Mathematics", organized and taught by Ellen Torrance, was a part of the Mathematical Association of America meeting in mid-January. □

Letters

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OASDI

Sir:

John H. Beales, Jr. (*The Actuary*, September 1985), quite properly chides me about blithely tossing around fractions of billions of dollars in my note "Current Financial Status of Social Security" (*The Actuary*, May 1985). My only alibi is that, due to my 50 years of work in Washington, D.C., I have an incurable case of Potomac Fever. One of the symptoms of that malady is a failure to recognize any monetary unit of less than $1 billion. And, as the late Senator Everett Dirksen so often said, "A billion here and a billion there, and soon you're talking about real money".

I attempted to condense the analysis by not presenting a great many figures, and instead using (hopefully) objective descriptive phrases. Also, the emphasis was on comparing the actual experience for fiscal year 1984 (October 1983 through September 1984) with the estimate for such year in the 1983 Trustees Report — because the 1984 report, being prepared in FY 1984, could be expected to be close to the actual experience. Also, when items are relatively small (such as fund balances), I tended to consider absolute differences, whereas using relative differences elsewhere.

The accompanying table compares the difference between the actual experience and the estimates, both in absolute and relative terms, for each of the 12 items — along with the descriptive phrases which Mr. Beales so expertly extracted from my note. I believe that it is fair to say that I did condense the analysis properly. The "slightly" characterizations were all 1% to 4% (except for one 1984 case, which was zero). The "about the same" characterizations were less than 1%. The "dollar" characterizations were, with rounding, correct. This, I believe, takes care of Mr. Beales' comment about "slightly" having a different meaning (i.e., smaller) when applied to "lower" than when applied to "higher" — because I was looking at *relative* differences, not *absolute* ones.

Finally, Mr. Beales is "mystified" by how a fund excess of "actual over estimated" of $2 billion (actually $2.4 billion) could be used to repay loans of $4.4 billion. The explanation is quite simple. The loan repayment from OASI to DI ($2.54 billion) was made at the discretion of the Managing Trustee (the Secretary of the Treasury), based on his judgment that the OASI Trust Fund was of sufficient size to do so. On the other hand, the loan repayment from OASI to HI ($1.82 billion — or well less than the $2.4 billion of excess of actual OASI fund size over estimated) was required by law — being based on the excess of (a) the actual balance of the OASI and DI Trust Funds combined on Dec. 31, 1984, over (b) 15% of the estimated outgo from these funds in 1985 (for more details on this provision, see my note in the March 1984 issue and my letter in the May 1984 issue). Thus, the amount of the repayment to HI did not depend solely on the size of the OASI Trust Fund, and the repayment from OASI to DI had no effect whatsoever on the required repayment from OASI to HI.

Robert J. Myers

COMPARISON OF OPERATIONS OF OASDI, HI, AND SMI TRUST FUNDS FOR FISCAL YEAR 1984, ESTIMATES IN 1983 AND 1984 TRUSTEES REPORTS VERSUS ACTUAL EXPERIENCE
(Dollar figures in billions)

Trust Fund	Descriptive Phrase Used[a/]	Actual Experience versus Estimate in 1983	Actual Experience versus Estimate in 1984
	Income in Year		
OASI	Slightly larger	$3.5(2%)	$1.2(1%)
DI	Slightly larger	$.2(1%)	$.1(0%)
HI	Slightly larger	$.8(2%)	$.2(0%)
SMI	About the same	$.1(0%)	-$.1(0%)
	Disbursements in Year		
OASI	About the same	$.1(0%)	-$.7(0%)
DI	Slightly larger	$.5(3%)	0(0%)
HI	$2.5 billion lower	$2.6(6%)	$2.4(5%)
SMI	Slightly lower	-$.9(-4%)	-$.8(-4%)
	Fund Balance at End of Year		
OASI	$2 billion higher	$2.4(10%)	$2.0(8%)
DI, 1983	$.5 billion lower	-$.5(10%)	[b/]
DI, 1984	About the same	[b/]	$.1(2%)
HI	$3 billion higher	$3.5(26%)	$2.6(18%)
SMI	$1 billion higher	$1.2(16%)	$.8(10%)

a/ As listed by Mr. Beales (with small editorial changes), and as in my paper.

b/ Not applicable.

Note: Figures in parentheses are excess or deficit of actual experience over estimate.

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Actuarial Cliff Jumpers

Sir:

What do you think of the actuary who jumped off a high cliff and then, unable to stop, wondered if he would have a safe landing?

How does that question relate to the article, "Changing Role of the Valuation Actuary," that James A. Tilley wrote for *The Actuary*, November 1985, which included a discussion of the interest rate (C-3) risk? Let me show you.

I agree with Mr. Tilley's comments: "Where significant C-3 risk could be involved, the valuation calculations

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Letters

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should be based on appropriate C-3 risk methodology and the results displayed in a manner that highlights the degree of reserve and surplus adequacy. Unqualified actuarial opinions about such adequacy should be avoided, however."

Inflation directly affects interest rates. However, inflation is not predictable long term. Therefore, the strategy associated with a large C-3 risk should be based upon the Law of Small Numbers. That is, risk avoidance — or take as little risk as possible.

I applaud and encourage the ongoing work being done by actuaries to quantify the C-3 risk. However, a simple example may be useful for those who still don't seem to understand this risk. Assume $1,000,000 is guaranteed in an insurance contract to grow at 10% for 12 years. The contract contains a book value cash-out provision. If, five years before the end of the guarantee period, interest rates rise to 40%, the market value of the assets will be about one-third the book value. What does the valuation actuary do then? Whether or not the assets are valued at book value, they are obviously not adequate at such time to cover the cash surrender value. Perhaps there is sufficient surplus available to provide for such deficiency. If not, and the company is impaired, the valuation actuary may be able to mention that his prior valuation opinions were qualified. Whom do you think will be given credit for this unfortunate result?

My company, The Hartford, has been actively promoting regulatory changes that would enable individual life insurance and individual annuity contracts to be written on a financially sound basis, with important principal and interest guarantees — but without a significant C-3 risk. This is accomplished by permitting the use of a "modification" called a market value adjustment formula when calculating cash surrender values.

The National Association of Insurance Commissioners adopted a model regulation on Modified Guaranteed Annuities at its June 1985 meeting. As of this writing, that regulation has not yet been adopted by any state, although similar legislation has recently been enacted in New York. A companion NAIC regulation on Modified Guaranteed Life Insurance is being considered by the NAIC. We expect it will be adopted at the June 1986 NAIC meeting.

I would urge other actuaries to actively participate in getting these regulatory changes adopted and to utilize those concepts in product development. It is the product development actuary who must learn to look before he leaps. If he doesn't, the valuation actuary's opinion will likely contain an unfortunate number of qualifications.

Donald R. Sondergeld

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Early Returns on "The Actuarian"

Sir:

The November edition of *The Actuary* provided a very refreshing change of pace. It was informative and stimulating, without being stuffy. I particularly enjoyed the tongue-in-cheek material on pages 4 and 5 *(The Actuarian)*. A bit more of this kind of material can help keep us from taking ourselves too seriously. Keep up the good work!

David M. Welsh

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Sir:

They say that imitation is the sincerest form of flattery. It is with this thought that we at Security Life of Denver enjoyed your actuarial graffiti piece in November.

Insurance graffiti have been an integral part of our advertising for over 15 years, during which period we have poked fun at virtually every aspect of our industry. I enclose a copy of our actuarial graffiti ad which first appeared in 1979.

In our changing industry, it is nice to see someone else inject a little humor into the pressures under which we constantly operate. We encourage you to continue with the humorous aspects of *The Actuary.*

Leslie L. Durland

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Sir:

I have just received my copy of the November issue. I am appalled by *The Actuarian* which now defaces two middle pages of what is otherwise an interesting newsletter. I found the contents neither clever nor amusing, and I trust that Volume 1 and Number 1 will be the last.

Philip J. Gould
Johannesburg

Editor's Note: Readers are surely aware that Associate Editor Deborah Poppel had full responsibility for the entire November issue, and *The Actuarian* is her brain-child. Although the returns are not all in we expect that the "2 to 1 in favor" vote indicated by the three letters above is indicative of the opinions of our readership. As for our own opinion as to the light touch that Debbie has displayed, we would like to publish the Security Life actuarial graffiti ad that Mr. Durland has so kindly furnished if we can find room, in this or some later issue of *The Actuary.*

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Actuaries as Managers

Sir:

A letter from Joseph Fafian, Jr. appearing in the October issue of *The Actuary* criticizes the Society for not doing more to help members handle the managerial side of their jobs.

The Canadian Institute of Actuaries has taken a different approach. A committee has been formed, with me as Chairman, to pursue whether business schools will grant exemptions for M.B.A. courses based on a person having completed actuarial exams. An actuary who wanted to learn more about managing could then take an M.B.A. without re-studying the math, economics and accounting he has already mastered for the actuarial exam.

This approach recognizes that actuarial bodies cannot do as good a job of training managers as many existing programs. Furthermore, the approach avoids further burdening the student who does not want to become a manager by adding more material to the exam syllabus, or, equally undesirable, removing some subject matter which is not taught elsewhere.

As the committee was formed only this September, I cannot report on our success to date. Possibly the Society should pursue a similar approach if the CIA committee is successful.

Steve Prince