The Newsletter of the Society of Actuaries
VOL. 25, NO. 8
OCTOBER 1991

THE Actuary

Editorial

On shaping public policy

by Anthony T. Spano

What could be a more appropriate time to focus on public policy activities? Everyday, we see news reports with a direct bearing on the insurance industry, pensions, and other fields in which we practice. At the same time, the voices of our profession urge us to participate more actively in these public debates.

In this issue, we have included several articles from actuaries who have worked on public policy matters, some of them involving the development of new laws and regulations. One of the authors, Dick Helms, describes some personal rewards from his experiences.

As someone who has dealt with public policy issues for the past 12 years, I'd like to add a few thoughts.

First, being involved in the dynamics of public policy formulation is definitely exciting and satisfying. The sensation often has been described as being "on the cutting edge." You realize that the ultimate result often has significant social and economic impact.

Next, despite our small size as a profession, actuaries can and often have had strong influence on public policy issues. For example, actuaries have played a major role in successfully defending the industry's risk classification practices, especially in sex-distinct rating.

Much of the skepticism about our influence stems from situations where we have been unsuccessful in

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Society elects 1991-92 officers

Walter S. Rugland was elected President-Elect of the Society of Actuaries for 1991-92.

Rugland is a consulting actuary at Milliman and Robertson, Inc., Bloomfield, Connecticut. He served as an SOA Vice-President from 1984-86 and as a Board member from 1976-79. He also has held offices in the American Academy of Actuaries (AAA) and the International Actuarial Association (AFIR).

Chosen as Vice-Presidents were W. James MacGinnitie, Michael E. Mateja, and James F. Reiskytl. MacGinnitie, chief actuary with Tillinghast/Towers Perrin, Atlanta, Georgia, served on the SOA Board from 1984-87. Mateja is vice president and corporate actuary at Aetna Life & Casualty Company, Hartford, Connecticut. He has been a Board member since 1988. Reiskytl is vice president - tax and financial planning at Northwestern

Walter S. Rugland

Mutual Life Insurance Company, Milwaukee, Wisconsin. He was on the Board from 1984 to 1987.

Elected to seats on the Board were Linda B. Emory, Judy Faucett, James C. Hickman, William C. Hsiao, Robert J. McKay, and John J. Palmer. Emory is senior vice president - strategic development at Life Insurance Company of Georgia in Atlanta. Faucett is principal at Coopers & Lybrand in New York. Hsiao is a

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VOLUME 25, NO. 8
OCTOBER 1991

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The Actuary is published monthly (except July and August) by the SOCIETY OF ACTUARIES, 475 North Martingale Road, Suite 800, Schaumburg, IL 60173-2226.
Daphne D. Bartlett, President;
David M. Holland, Vice-President and Secretary;
Michael R. Winn, Vice-President and Treasurer;
Kenneth A. McFarquhar, Director of Publications.
Non-member subscriptions: students, $6.00; others, $15.00. Send subscriptions to: Society of Actuaries, P.O. Box 95668, Chicago, IL 60694.

Longer term Associates' status explored by Board

by Linda M. Delgadillo
SOA Director of Communications

For some time, the Society's Board has been concerned about the status of longer term Associates. Many of these people are prominent actuaries and have contributed greatly to the profession. In this article, the term "long-term Associates" will be used, defined as those who have been Associates for 10 or more years.

Specifically, the Board has questioned whether long-term ASAs feel alienated from the Society because they sense an inability to actively contribute and participate in Society activities at higher levels. This includes the stipulation in both the Constitution and Bylaws that only Fellows can vote.

To explore this issue, the Board recently surveyed the Society's long-term Associates. Associates were asked about their general level of satisfaction with the Society, whether they believed the Society provided appropriate recognition to long-term Associates, and if membership in the Society meets their needs. They also were asked what their primary reason was for not pursuing Fellowship and if they intended to pursue Fellowship in the future.

More than 82% of the respondents indicated that their general level of satisfaction with the Society was either high or in line with expectations. In response to the question about whether the SOA provides appropriate recognition to long-term Associates, almost 50% believed that it did, but another 44% believed that the Society did not appropriately recognize long-term Associates.

About 74% indicated that they would not pursue the FSA designation. The primary reason indicated was that Fellowship was not, in their opinion, essential to their area of practice. Among those who responded in this manner, the highest percentage came from pension actuaries.

Many respondents took the opportunity to elaborate on their comments. The responses covered a broad range of feelings; however, three significant issues emerged:

(1) If long-term Associates must pay the same dues as Fellows, then they should have the same privileges as FSAs, including voting in Society elections.

(2) Associates are not recognized for achieving this level of membership. Several suggestions were made about providing a certificate after completing Associateship examinations.

(3) Several respondents simply stated, "Stop treating Associates like second-class citizens."

The Board has taken the initiative to respond to the second issue by providing Associate certificates to all Associates dating back to the founding of the Society of Actuaries.

After much discussion at both Executive Committee and Board meetings, the Board agreed at its June 1991 meeting to develop a constitutional amendment permitting Associates of 10 years or more to vote. The members voting on this issue would be Fellows. Results from an Elections Committee survey performed in 1990 indicated that a large number of Fellows would not object to voting rights for Associates of 10 years or more.

In addition, the Board believed that Associates of 10 years or more are not participating as actively as they might in Society activities, and this is the Society's loss. While the Board recognizes the importance of encouraging Associates to pursue Fellowship, it also recognizes that actuaries in some areas of practice may not perceive Fellowship as beneficial as those in other areas. Not allowing them to vote might continue the sense of alienation already expressed in the Associate survey by an important constituency of the Society's membership.

The pluses in allowing longer term Associates to vote are that it would encourage their participation in other Society activities and alleviate the sense that many have about being "second class citizens."

It is important for the Board to have a sense of what the members are thinking on how best to serve our long-term Associates. The Board especially needs your feedback because later this year, it plans to submit to Fellows a constitutional amendment giving Associates of 10 or more years of membership the right to vote in Society elections.

Getting involved in public issues

by Richard L. Helms

Actuaries are increasingly participating in the public policy arena. In this article, I will relate my own experiences so that it might help some of you decide to become involved with an issue in the future.

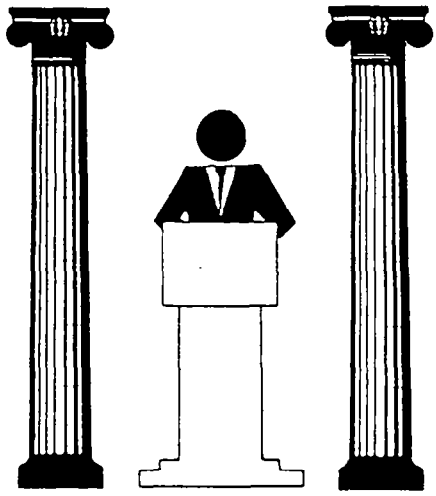
My role at The Principal Financial Group could be described as chief financial officer for the Group Life and Health Division. I am involved in pricing and financial activities for all our group product lines. The Principal Financial Group is active in all size cases for group insurance, but in particular we have more than 45,000 small employer medical customers with fewer than 25 employees. This makes us one of the largest small group health insurers in the country.

Involvement in small group health insurance reform

When the National Association of Insurance Commissioners (NAIC) decided to establish an industry advisory committee on small group health insurance rate reform, it called on our company, and I served on the committee. Committee representation included both commercial carriers and Blue Cross/Blue Shield organizations. Other actuaries were on the committee, as well as lawyers and government relations experts. We worked with insurance commissioners on an NAIC subcommittee.

The advisory committee's role was to design solutions to problems the commissioners outlined, such as abuses in small employer health insurance rating and coverage lost because of claim experience. In the process we had to educate the commissioners both on how the small employer health insurance marketplace works and the hazards of oversimplified solutions. Ability to communicate with people of diverse experience levels was important.

The result of the committee's work was a model law recommended to the NAIC. Actuaries played a key role in designing many of the technical details of the rating limitations in the model. The commissioners



made a few changes to the recommendations and formally adopted a model law in December 1990. The law has been passed with only minor changes in a dozen states. Many others are considering it.

While serving on this industry committee, I spoke with lobbyists and legislators in my home state of Iowa about small group health reform in our state. These conversations were helpful in getting a bad piece of legislation dropped. They waited instead for the NAIC model to be developed, and Iowa was one of the first states to adopt it.

My involvement in small employer health insurance reform led to service on another NAIC industry advisory committee. This committee dealt with access to health insurance for small employers who currently don't have it. The committee developed six models for guaranteeing access and forwarded them to the NAIC. The models are being considered now by the commissioners. Two have been exposed for comment and are expected to be adopted as NAIC model laws in December.

This activity also led to my attending several Washington, D.C., functions sponsored by Principal to educate federal legislative staff personnel on small group health reform. Some personnel have requested more information on related subjects, such as community rating.

Keys to successful participation

At least three keys exist for successful participation in the public policy arena: (1) You must know the subject matter. You must be able to make judgments about what might work and what won't work to solve the problem. (2) You need good communication skills. The audience of regulators and legislators will have varying degrees of knowledge about the subject. They may need education on technical matters in terms they can understand. (3) An open mind is very helpful. Many viewpoints must be heard and recognized in developing solutions to public policy problems. You should have the ability to see alternatives and reach compromise solutions.

Benefits from involvement

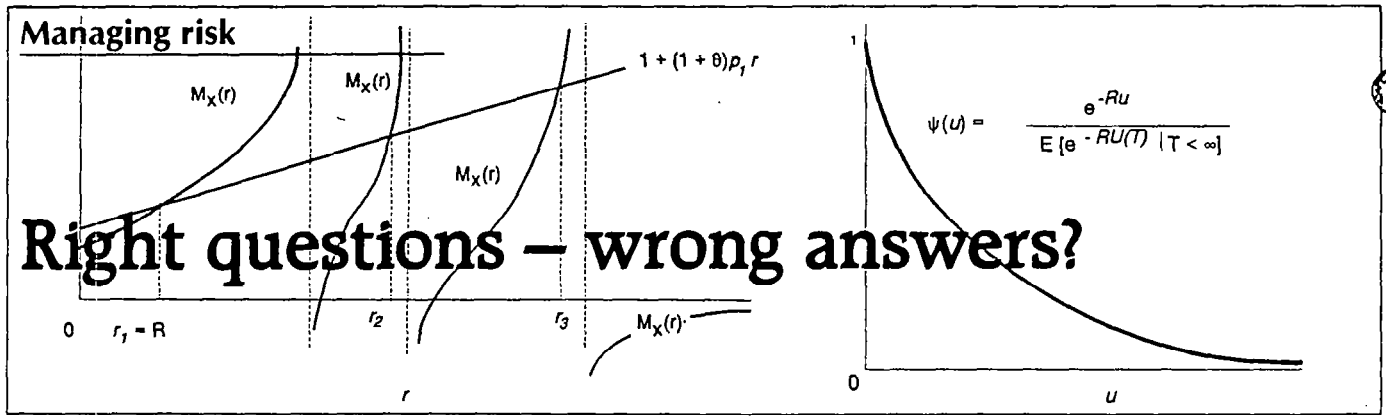
The most significant benefit from public policy involvement is better public policy. I believe the industry efforts on small group health reform have led to public policy improvements, as evidenced by the result in my home state.

Another advantage of participating in public policy matters is that it broadens an actuary's viewpoints. I was exposed to views from Blue Cross/Blue Shield and the HMO industry that were different from those in the commercial insurance industry. Views of small business, regulators, and legislators also were considered. Each of these reflected different, yet related, agendas on small group health insurance reform.

Once you get involved in the public policy arena, additional exposure often follows. If you handle requests for information in a straightforward and helpful fashion, you find others asking for more of your opinions, and you have an impact on policymakers.

Active public policy debates are occurring today in practically every field in which actuaries commonly practice. I urge you to become involved. Actuaries can play a key role in making sure that some of the solutions work properly.

Richard L. Helms is Second Vice President with The Principal Financial Group.



Right questions – wrong answers?

by Michael J. Cowell

Scene: Society of Actuaries meeting, New York, May 1987:

Arnold Dicke:

...investing in high yield bonds... might well prove to be very good for the policyholder, but the problem is that the policyholder often doesn't know that one company is involved in one sort of investing and another company in another sort. Do you think that companies involved in riskier investment strategies should be forced to issue a prospectus...?

Fred Carr:

No.

The speech by Fred Carr, president of Executive Life Insurance Company, was prophetically titled, "Risk is Your Enemy." The speech and the Q&A that followed are recorded in the *Record – Society of Actuaries*, Vol. 13, No. 3, pp. 1,051-1,070.

Life company survival, circa 1960:

Cash flow – enough to pay claims

Reserves – all statutory, no GAAP, sufficient to pay the excess of death benefits over future premiums

Assets – accumulated in seemingly risk free bonds and mortgages to cover that excess, and the occasional policy loan or surrender.

Today, except for the AIDS risk, concern is focused less on survival of insureds than on bonds and mortgages expiring all around us. But do we have a coherent response when institutions once thought invulnerable totter on the brink of insolvency?

This article addresses the need for new approaches to valuation, the assumptions underlying the Appointed Actuary concept, and the actuary's role in solvency. Better coordination of our efforts in these areas might lead to better service to our publics and provide significant opportunity for our profession.

New valuation mortality and morbidity tables

In the past year, John Montgomery, chief actuary of the California Insurance Department, has sought the Society's help to update valuation mortality for individual life insurance and annuities and to set a new morbidity standard for long-term care coverage. Responding to our suggestion that we go beyond development of new tables, Montgomery agrees that we may need to explore new methods of valuation (rather than tables), particularly for long-term care, and has suggested "the concept of variance" be introduced.

The Appointed Actuary

Last December the NAIC incorporated a qualified actuary's opinion on reserves into the Standard Valuation Law, the fruition of a decade-long effort. Walter Rugland, who chairs the Society/Academy Joint Committee on the Valuation Actuary (JCOVA), describes the process and its implications in the May 1991 issue of *The Actuary*. He explains the constraint that actuaries not be asked to opine on surplus adequacy nor on ongoing solvency.

Donald Cody, also a member of JCOVA, states:

The limitations imposed...would probably have prevented an Appointed Actuary opinion...from being effective against the currently emerging problems. The limitations constrain the Appointed Actuary from opining on surplus adequacy and ongoing solvency...crucial matters for regulation to be effective.

These limitations may have been seen as appropriate in the environment of 1980. Given the industry's recent experience with solvency, are they right for the 1990s?

Which company will be next to experience financial problems aggravated by inadequate capital or caused by media or rating agency perceptions of balance sheet weakness or illiquidity? Much of what has occurred over the past 10 years, starting with Baldwin United, could have been predicted and, if not prevented, at least provided for better.

Risk based capital

Our profession put extensive effort during the 1980s into quantifying the risks assumed by insurers and the required capital to protect against insolvency. At the core of some of this research is the recognition, explicit or implicit, that risk based capital acts as an extension of reserves. Risk based capital extends the concept of reserves as a 50% likelihood estimate based on a "snapshot" of assets and a single estimate of liabilities. It is designed to measure the assets needed above those backing reserves so that at a specific level of statistical confidence, for example, 90%, 95%, 99%, liabilities will not exceed assets over some defined time horizon.

An industry advisory committee appointed by the NAIC to recommend a risk based capital approach is applying these concepts. Cande Olsen describes the work of this committee in an article in this issue.

Because of the close relationship of this activity to that of the Appointed Actuary, or at least to what

many believe that role should be, advisory committee members are encouraging the incorporation of their work into the Society's discussions. This year's annual meeting includes a panel discussion and workshops on the subject.

What is our job now?

We often challenge ourselves about the future of the actuary and the actuary of the future. These efforts frequently lead to searches for nontraditional roles for the actuary or for roles we think should be ours that have been usurped by other professions.

Solvency and capital adequacy are issues profoundly affecting the financial services industry in the 1990s. Actuaries are uniquely suited by training to address them. Should we accept a role for the Appointed Actuary that constrains opinion on these matters?

In 1980 when work leading to the Appointed Actuary concept began, these issues were scarcely envisioned. Groundwork for the theoretical advances needed in actuarial education were barely on the drawing board. But to illustrate the progress actually made in the 1980s, consider example 7.12 in *Actuarial Mathematics*, the Society text for Courses 150 and 151. The example describes a portfolio of insurance policies at various durations. In addition to calculating the aggregate reserve (expected of "old timers" on the former Part 4), the student is asked to calculate the variance of the losses and the amount necessary to give the insurer a probability of 95% that the policy obligations will be met.

This is a modest example of the broader perspective available to actuaries today. Yet for actuarial opinions we seem content to be governed by the single-moment deterministic approaches of a generation ago.

Addressing valuation mortality without recognizing the significance of what happened in the 1980s is just "rearranging deckchairs on the Titanic." We hardly need yet another update of mortality tables while companies are becoming insolvent because the actuary isn't applying available analytical tools to define capital requirements, doesn't grasp that liabilities are meaningless if not backed by assets available to pay obligations, and feels constrained from opining on surplus adequacy.

This is not to belittle the efforts of those investigating valuation mortality. Rather, it is to suggest that their work can be meaningful only in the broadest context of how it will be used.

Inadequate valuation mortality did not contribute to the rash of recent solvency problems. However, some of them might have been avoided if actuaries had opined on capital adequacy or if some company managements had addressed differently the kind of questions that Society members asked Fred Carr.

Risk is a concept that is tough to grasp, more complex to quantify, and most difficult to explain. Only when ignored does it become our enemy. The current crisis presents opportunities to develop solutions that reflect our training in its measurement, management, and communication.

I have been asked to work with the Executive Committee, the Board, and the leadership of the Sections over the next few months to better integrate the Society's activities in experience studies, valuation methods, the Appointed Actuary concept, and risk based capital. I invite your comments on these issues and on the appropriate Society response.

Michael J. Cowell, Vice President and Corporate Actuary, UNUM Life Insurance Company, serves as a Vice-President of the Society of Actuaries.

Editorial cont'd

defeating regulatory proposals that have not made sense actuarially. Frustrating as it might be, we must not forget that in the public policy arena, political considerations often will override scientific considerations. Losing one battle should not deter us from fighting the next one, where the political landscape may be more receptive to our views.

Finally, and most important in any forum, credibility is vital. It is proper and necessary that we promote our position on an issue aggressively. But in doing so, we must make sure that whatever we say or write is accurate, defensible, responsive to the issue, and communicated effectively. All of this spells credibility, and I think that represents the profession's greatest asset. We have always benefited from an impression by those who know us that our profession actively promotes and consistently values the highest standards of integrity. To have this as the hallmark of our profession is an invaluable attribute as we try to shape public policy.

Let us know

A few members have reported that their copies of the most recent *Transactions of the Society of Actuaries*, Volume 42, were bound with the cover upside down. Please check your *TSA* for any binding problems. If you discover any problems, please return the book to Donna Klehr at the Society office so she can send you a new one.

New officers cont'd

professor at Harvard University in Boston. McKay is partner at Hewitt Associates in North York, Ontario. Palmer is senior vice president at Life Insurance Company of Virginia in Richmond.

As a result of Section elections, eight special interest Sections have added new Council members with three-year terms. They are:

Futurism – Godfrey Perrott, Robert W. Ryan, John B. Yanko
Health – Judith A. Discenza, Richard L. Helms, Francis G. Morewood
Individual Life Insurance and Annuity Product Development – Gregory D. Jacobs, Sheila A. Hart, Mark A. Tullis
Investment – Richard Q. Wendt, Peter Hepokoski, Elias S. Shiu
Life Insurance Company Financial Reporting – Bruce D. Bengtson, Kriss Cloninger, Joseph A. Gilmour
Nontraditional Marketing – Richard L. Bergstrom, Kiran Desai, Jeffrey C. Harper (1-year term to fill unexpired term), Christopher H. Hause
Pension – Brian A.P. FitzGerald, Ethan E. Kra, Ronnie Susan Thierman
Reinsurance – Craig M. Baldwin, Johanna B. Becker, Denis W. Loring (1-year term to fill unexpired term), Paul A. Schuster

Actuarial involvement with FASB issues

by James A. Geyer

Most of us have heard the old saw about actuaries who wanted to be accountants but lacked the personality. There may be a smidgen of truth to the first part, at least for those of us who spend time trying to influence the accounting profession in its quest to perfect accounting standards. This usually means working with the Financial Accounting Standards Board (FASB).

What is FASB?

This group of seven accountants is empowered with setting GAAP accounting standards. They are the legislators of the GAAP accounting world, issuing or revising standards as necessary. Like other legislators, they follow procedures in developing standards: staff members develop background information and options, public hearings are conducted, preliminary standards are published with a public review period and, finally, the standards are issued. At all stages of the process, interested parties can try to enlighten and influence the FASB.

Why do we care?

We take great interest in these standards for at least two reasons:

(1) For stock company actuaries, some standards can have a great effect on the company's GAAP financials, which in turn can affect pricing decisions, usually negatively.

(2) Some standards can have a profound effect on our customers' financials and thus can affect the attractiveness and perhaps the very need for our products.

Some recent standards include:

- Employer's Accounting for Post-Retirement Benefits other than Pensions (FAS 106), which requires employees to report an accrued liability for retiree health benefits
- Accounting for Income Taxes (FAS 96 and its unfinished replacement), which may fundamentally change the way we calculate GAAP taxes
- Employers' Accounting for Pensions (FAS 87), which outlines an accrual basis for accounting for pension plan expenses

Accounting for GICs

A current topic that is important to actuaries involved with guaranteed interest contracts (GICs) and related products involves accounting standards for pension plans. The last formal FASB statement that addressed this issue (FAS 35) for defined benefit plans was released in 1980. Much has changed since then, and defined contribution plans and GICs have grown tremendously. Also, recently noninsurance companies have been selling products very similar to GICs, such as bank investment contracts (BICs). This has led to questions by both defined benefit and defined contribution plans about the proper accounting for GICs and similar products and, in particular, whether these plans should report their GIC and similar investments at book value or market value.

For defined benefit plans, the FASB has tentatively decided that market value should be used. Because a defined benefit plan determines its liabilities with reference to current and projected interest rates, and its other assets usually are reported at market value, use of market value for GICs appears appropriate. However, because no active secondary market exists for GICs, determining these market values will likely create administrative problems for plan sponsors.

The more serious issue for us, and one about which the FASB is still undecided, is whether defined contribution plans should use book or market value for their GICs and similar investments.

Most industry representatives are convinced that the proper answer is book value. It is appropriate for the plan to report its liabilities at book value because all communication to participants and all transactions by participants are at book value, and the plan's liability is the sum of the participants' balances. It is appropriate for the plan to report its GIC assets at book value because the GICs held by the plan are generally structured with a direct tie to the participants' book value withdrawals (that is, they are "benefit responsive"), and the interest rate earned by the plan on the GICs is passed through to the interest rate credited to the participants' balances.

We fear that the FASB may require defined contribution plans to report their assets at market value, while liabilities continue to be reported at book value. This mismatch could lead to large deficits or surpluses for the plan, which would be incompatible with the nature of a defined contribution plan. Indeed, we believe such a standard would lead plans either to (1) abandon the book value transaction and reporting basis to participants in order to report the plan's liability at market value, or (2) shorten their assets substantially (implying less yield) to lessen the market value volatility. Either would reduce the attractiveness of GIC funds to participants and would ultimately reduce our role in this market.

Actuaries help in decision process

Several actuaries have worked both through their companies and through a working group of the American Council of Life Insurance (ACLI) to help the FASB come to the proper decision on this issue. Our primary role has been to explain the precise workings of our products and to demonstrate what market value might mean, how it might be computed, and why it is inconsistent with the basic structure of a defined contribution plan.

Current outlook

The FASB now appears set to require that defined benefit and defined contribution plans account for assets at market value, with a probable exception for defined contribution benefit responsive contracts. We will still need to work with FASB to develop standards for determining what is considered a benefit responsive contract. We hope that the actuary/accountant personality thing won't get in the way.

We expect that next year the FASB will issue an exposure draft containing its recommendations and conclusions. Following the receipt and consideration of comments, a final statement could be released late next year, with a possible effective date of January 1, 1993.

James A. Geyer is Vice President, Aetna Life & Casualty.

NAIC developing risk based capital structure

by Cande Olsen

Public concern over life insurance company solvency has been heightened by recent insurance department takeovers of some major companies. Since these companies had broad exposure to junk bonds or commercial real estate investments, the public has perceived these investments to be the problem.

The solvency question is actually much more complicated. Junk bonds and commercial real estate are not necessarily inappropriate investments for a life insurance company. The total mix of assets and liabilities and the related expected cash flows are more predictive of a company's financial future and of how much surplus to have on hand.

The amount of surplus a company is likely to need can be estimated by using a risk based capital formula that considers the company's mix of assets and liabilities. The advantage of a risk based capital approach is that it looks at the whole company profile and not just at isolated parts of the balance sheet.

With this concept in mind, the National Association of Insurance Commissioners (NAIC) organized a life insurance working group (and a corresponding property/casualty group) to develop an appropriate risk based capital formula and a framework for regulatory action to be used with that formula. An industry advisory committee, consisting mostly of insurance company and consulting actuaries, was organized to support the NAIC working group. Many of the advisory committee members have had experience developing risk based capital formulas to manage surplus in their own companies. They are committed to this approach and have devoted much time to this effort.

The advisory committee decided to follow the general structure of traditional risk based capital formulas. These break down company risks into depreciation risk (C-1), insurance/pricing risk (C-2), interest rate change risk (C-3), and general business risk (C-4). Exposure to risk in each of these categories is represented by a particular asset, liability, or income/expense item found in the annual statement. A factor is then determined that can be applied to calculate the required surplus to protect the company against this risk.

The advisory committee formed separate subcommittees to study different risks. In late July, a preliminary formula was developed, and testing on a broad range of companies began. The formula will require many adjustments as additional theoretical work continues and testing reveals inconsistencies. The committee will present its final recommendation to the NAIC working group by December.

The following are some characteristics of each of the risk components:

C-1 (asset depreciation) risk

The C-1 risk component is intended to cover all risks associated with losses related to assets. The asset categories in the C-1 formula will probably be similar to those found in other traditional risk based capital formulas. The factors to be recommended will be based on both stochastic modeling and experience analysis. The six risk categories used in the mandatory securities valuation reserve calculation are being considered for bonds.

Noninvestment grade bonds will probably have significantly higher surplus requirements than investment grade bonds. Surplus requirements for mortgages, real estate, and common stock will be in line with bond surplus requirements. In addition, a factor probably will be applied to bonds and mortgages that considers the increased risk of a smaller portfolio size. The advisory committee is still reviewing how to establish the level of required surplus with respect to a company's investment in subsidiaries.

C-2 (insurance/pricing) risk

The C-2 risk component encompasses risks associated with pricing. The lines of business in the C-2 formula will be similar to those found in other traditional risk based capital formulas. The factors to be recommended will be based on risk theory, stochastic modeling, and experience analysis and will probably measure risk exposure by using net amount at risk for life insurance and premiums for health insurance.

A step formula to reflect the size of a company's in-force block of business also is being considered, since that risk decreases as the size of the block increases. In addition, the formula might reflect an increase in risk, where appropriate, for major increases in new business.

C-3 (interest rate change) risk

The C-3 risk component relates to losses resulting from swings in

Continued on page 8 column 1

1991 Fall Seminar Calendar

Multivariate Immunization Theory	October 9-10 November 13-14	Cambridge, Mass. MIT Faculty Club
Valuation Actuary Symposium	Oct. 31-Nov. 1	Wesley Chapel, Fla. Saddlebrook Resort
Case Studies: Valuation Actuary's Response to ASPs	November 1-2	Wesley Chapel, Fla. Saddlebrook Resort
Status & Strategies, Small Group Health Reform	November 4	Amelia Island, Fla. Amelia Island Plantation
Critical Issues in Contemporary Risk Selection	November 4-5	Amelia Island, Fla. Amelia Island Plantation
Topics in Actuarial Assumptions	November 15	Bolton Landing, N.Y. The Sagamore
Issues in Plan Qualifications	November 15	Bolton Landing, N.Y. The Sagamore

For more information regarding seminars, call 708-706-3545.

NAIC cont'd

interest rates that cause asset values to be less than required to meet emerging liability obligations. The C-3 risk recommendation probably will assume that the valuation actuary has used cash flow testing in setting the level of reserves. The required surplus would then be the capital required in excess of reserves. The preliminary formula factors vary between life insurance and annuities. Within annuities, they differ by the withdrawal categories specified in the Notes to Financial Statements in the statutory blank.

C-4 (business) risk

The C-4 risk component is designed to cover normal business and management risks. It may be expressed as a factor applied to C-1, C-2, and C-3 risk components.

Regulatory action

Three different levels of regulatory action based on the ratio of actual to required surplus may be recommended. Level A would involve initial regulatory scrutiny, such as requiring the company to submit a business plan. Level B would identify situations requiring a detailed investigation of the company. Level C identifies the minimum level of risk based capital, below which state conservatorship is required.

The formula and framework for regulatory action that have been described are all subject to change based on the testing results.

No risk based capital formula can make an absolute statement of a company's financial health. The advisory committee is confident, however, that the formula it finally recommends will distinguish strongly capitalized from weakly capitalized companies. This formula is expected to help regulators in identifying companies whose capital is significantly below that of other companies with similar business profiles.

Cande Olsen is Vice President, New York Life Insurance Company.

ASPA has new offices

The American Society of Pension Actuaries (ASPA) has moved from Washington, DC, to Arlington, Virginia. The new address is: 4350 North Fairfax Drive, Suite 820, Arlington, VA 22203. Its new telephone number is 703-516-9300, and its fax number is 703-516-9308.

Continuing care retirement community population and financial model available

by Faye Albert

Continuing care retirement communities (CCRCs) and their financial problems have been receiving much attention recently. The emergence and growth of CCRCs has resulted in an increasing need for management information that applies actuarial principles. As reported in *The Actuary* (December 1989), SOA research committees selected a team of Bill Bluhm, Bob Cumming, and Stan Roberts of Milliman & Robertson, Inc., to develop a model for CCRC population and cash flow projections. The team has completed the model, and it is available now to members of the SOA and the Casualty Actuarial Society for research and educational activities.

The PC-based model calculates both deterministic and stochastic versions of population projections, actuarial valuations, and cash flow projections. The projections focus on the demographic elements and do not take into account financial risks such as deterioration of asset value. The population projections anticipate the number of residents in independent living units, personal care beds, and nursing care beds over several years. The model performs projections for both closed and open group populations. The model also performs a closed group valuation, including a projected statement of operations for one year and a cash flow projection.

The model can be run on an IBM-compatible PC with two megabytes of memory, using Lotus 1-2-3 (version 2.2) and a Hewlett Packard Laserjet Series II printer. The model consists of a main program in executable machine language and two Lotus 1-2-3 worksheets. Input to and output from the main program are handled by the Lotus 1-2-3 worksheets.

Using the model, developing assumptions, and studying the results provide the actuary with valuable insights into how a CCRC operates and the risks involved in CCRC funding arrangements, disregarding possible changes in asset value. This process will lead the actuary to some of the questions and answers that arise in performing an actuarial valuation for a CCRC.

The model currently contains assumptions, for example, morbidity and mortality assumptions, that are illustrative but not applicable to any single CCRC. The SOA now has a project underway to survey CCRCs and develop an experience data base. The data base will contain information on items such as mortality, morbidity, and withdrawals, as well as living arrangement, type of facility, and type of contract. It is likely that a by-product from this data base will be information that can be used directly in the model.

An order form for the model documentation and diskette is available from Judy Yore at the SOA office, 708-706-3573.

For those who would like additional information, the researchers developed a bibliography of CCRC materials in 1990. It is still available and can be obtained by contacting Judy Yore.

Faye Albert, Consulting Actuary, Albert Associates, is Chairperson of the Project Oversight Group for the Actuarial Aspects of Continuing Care Retirement Communities research project.

CAPP becomes CCA

The Conference of Actuaries in Public Practice (CAPP) has passed an amendment that changes its name, effective September 1, 1991, to Conference of Consulting Actuaries (CCA). The Board recommended the change because the new name better reflects the organization's growing focus on the perspective of the consulting actuary.

Publish or perish?

by David M. Holland

Do you have a favorite publication of the Society of Actuaries? Are you satisfied with SOA publications? What would you do to improve them? Shall they be published or should they perish?

As you ponder these questions, let me offer some personal observations. Our publications exist to serve the needs of our members and to help define the profession. SOA publications are by actuaries and for actuaries. Staff support is excellent. Within the past year, technical publishing awards have been bestowed on *The Actuary*, the *Transactions*, and the *Index to Publications*. We have every right to be proud of our publications.

What's your favorite?

My impression is that *The Actuary* would be high on the most popular list. It is short enough to read from cover to cover in one sitting. The articles are current and often deal with items of interest throughout the profession. Whenever changes are made or there are special issues, the staff receives many comments. The puzzles are especially popular. I particularly enjoyed the "Let's Make a Deal" series. Based on the 50 letters received on the subject, so did many others.

The various Section newsletters may become formidable competition for *The Actuary*. The topics are practice related, the issues are current, and longer articles can be included. Some of the Section publications are becoming closer to journals than newsletters.

My vote for the most useful publication is the *Yearbook*. My copy soon becomes dog-eared, and I often have to chase it down to get it back. The *Yearbook* provides ready reference to actuaries from the President of the SOA, to the CEO of the largest life insurance company in North America, to the newest ASAs. The Board is considering, however, combining the SOA's and American Academy of Actuaries' addresses and phone numbers into a new actuarial directory. This would save money by eliminating the *Actuarial Phonebook* and by reducing the size of the SOA *Yearbook*, which would contain only the narrative that appears in the front portion of the current *Yearbook*.

Cornerstones

A profession's literature is the cornerstone for its standards of practice. For the SOA, this literature is contained in the *Transactions*, the *Record*, Study Notes, and textbooks.

The *Transactions* is the SOA's scholarly journal. Publishing a paper in the *Transactions* should be considered an honor as well as a contribution to the profession.

The review process for the *Transactions* is the area that generates the most comments. Peer review of scientific manuscripts can be traced back to 1752 when the Royal Society of London established a "Committee on Papers." This committee reviewed all articles submitted for its *Philosophical Transactions*. The SOA Committee on Papers carries on this tradition.

Although the review process has improved and refined many manuscripts, most authors do not like having their work rejected or criticized. Actuaries are no exception. The Committee on Papers must balance the high standards of a scholarly journal with the practicalities of communicating useful information to a professional society. Every effort is made to handle this with the utmost of integrity, but the process is not perfect. If you feel a proper decision has not been reached on a paper, you may appeal the decision to the SOA Vice-President and Secretary.

In the past few years, the Committee on Papers has implemented many procedural changes to recruit expert reviewers, speed up the initial review, provide for conditional acceptance, and improve the handling of resubmissions. A task force of the Publications Policy Committee is reviewing the process for further improvements.

The *Record* is a very valuable portion of our literature. It provides in-depth coverage of current topics presented by leading experts at SOA meetings. Producing the *Record* is a massive undertaking. Last year, the four meetings accounted for 3,190 pages of text.

The most frequently asked question is, "Can't you get the *Record* out any sooner?" The Editorial Board of the *Record* has instituted many changes to speed up the process. Few options are available to achieve a quantum reduction in publishing time. Elimination or deferral of transcripts received beyond a cutoff date may have to be considered. Most other options involve throwing large amounts of money at the problem, but the benefits do not justify the cost.

If you urgently need information that was presented at an SOA meeting, you may order the cassette recording of the session. If the cassette is not enough, then you should see if the speakers will provide a copy of their remarks as a professional courtesy. If that does not work, contact the SOA office to see if the transcript for a particular session has been completed and can be sent to you (at a nominal charge to cover expenses).

More publications

In the beginning, *ARCH* was an "Actuarial Research Clearing House." You sent the SOA an unspecified amount

Continued on page 12 column 3

Book Review

Text for next generation of actuaries

by James Hickman

Introduction to the Mathematics of Demography, by Robert L. Brown. Published by ACTEX Publications, Winsted, CT 06098, 1991, (203-379-5470). 231 pages, $37.50.

Since people are important and statistics is the branch of science dealing with the collection, analysis, interpretation, and presentation of numerical data, it follows that demography, the statistical and mathematical study of human populations, is important. The Society of Actuaries and its predecessor organizations have accepted this chain of reasoning, and demography has been part of the education program for actuaries for many years.

One generation of actuaries studied demography from *Population Statistics and Their Compilation* by Hugh H. Wolfenden, published by the Actuarial Society of America in 1925 as "Actuarial Study No. 3." The Society of Actuaries published the revised edition in 1954.

The following generations of actuaries studied the subject by reading *Introduction to Demography* by Mortimer Spiegelman. The first edition was published in 1955 and the revised edition in 1968.

It is likely that the next generation of students will learn demography from *Introduction to the Mathematics of Demography*, because it is now the principal reference for Course 161, Mathematics of Demography.

The author, Robert L. Brown, is associate professor, Department of Statistics and Actuarial Science at the University of Waterloo (Ontario). He has served as president of the Canadian Institute of Actuaries and has been a frequent contributor to the literature of demography.

The word "mathematics" in the title should be taken seriously. The author devotes much of Chapter 6 and all of Appendix C to the mathematics of the continuous version of stable population theory. Some of the fascinating interconnections between this theory and ruin probability results from risk theory are shown.

Chapter 7 on population projections introduces projection matrices. These projection matrices, with survival and birth rates as elements, are called Leslie matrices, named for the biostatistician and demographer who investigated their properties in the late 1940s. If the Leslie matrix remains constant over time, the population will approach a stable age distribution. This is illustrated in Chapter 6, but the development is somewhat sketchy. The rich theory that can be revealed by a spectral decomposition of the Leslie matrix is not developed.

Because of the emphasis on the mathematics of demography, some traditional topics of demography are absent. For example, Spiegelman's revised edition included chapters on the geographic distribution, education, and income of the population and the work force. These ideas are not represented in Brown's book.

The construction of life tables from census data is, however, covered in Chapter 4. The construction of the 1985-87 Canadian Life Tables and the 1979-81 U.S. Life Tables are described.

Chapter 5, "Stationary Population Theory," has much in common with Jordan, Bowers, and others. Stationary populations are unrealistic models that serve primarily as stepping stones to more useful models, yet they persist in actuarial literature. I suppose this may be because of the elementary but challenging puzzles that can be derived from these models.

Unlike its predecessor books by Spiegelman and Wolfenden, the book by Brown is a textbook. Each chapter concludes with a set of exercises. Some of the exercises are based on questions that have appeared on Course 161 examinations.

Chapter 8, the final chapter, is modestly entitled, "Use of Census Data." In fact, Brown devotes most of the chapter to the gargantuan issues involved with population projections and funding social security. He does not cover marketing and work force planning uses of census data.

James Hickman is Professor of Business and Statistics, University of Wisconsin.

Society sponsors high yield bond study

by Robert J. Johansen

The Research Management Committee of the Society of Actuaries has awarded a research project contract to Albert Associates, an actuarial consulting firm in Miami, Florida. Albert Associates will analyze the bond investment experience of a group of medium-to-large life insurance companies with significant holdings of high yield bonds. The study will cover five calendar years, 1986 through 1990. Results should be available in the early months of 1992.

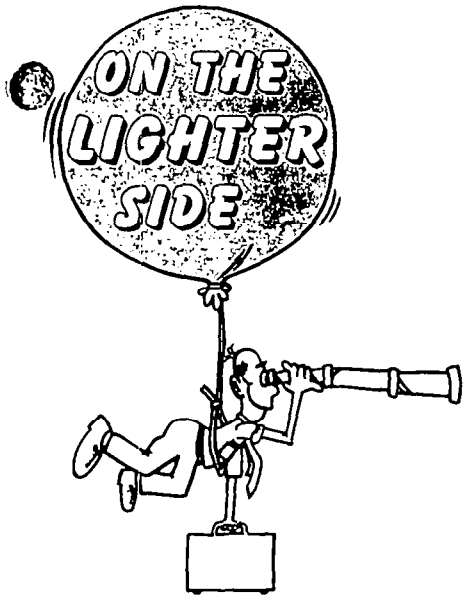
The researcher will use only publicly available data contained in annual statements filed with state insurance departments. For practical reasons, the study will be restricted to:

- Page 2, Assets
- Page 8, Exhibits 3 and 4
- Page 29A, Form for Calculating MSVR
- Page 29B, Schedule D, Part 1A and Schedule DM (Market Over Book)

Detailed bond data from Schedule D will not be used.

The study will analyze total bond investment returns versus the ratio of high yield bonds to invested assets and other factors affecting yield. The rate of return will include interest and capital gains, with and without change in market over book. The investment results also will be compared with those of a sample of companies with little or no high yield bonds. Published results will aggregate the data. Individual company data will not be released.

Robert J. Johansen, Chairperson of the Project Oversight Group on Study of Long-Term Bond Yields of Life Insurance Companies with High Yield Bond Portfolios, is Consulting Actuary, Life Actuarial Services.



Who's got the record?

Mark Kinzer writes, "I thought I'd brag a little about the recent May exam results. My 15-year-old nephew, Jim Rath, Fairfield, Connecticut, passed Exam 100. I wonder if any records have been kept regarding youngest successful exam takers."

Bern Bartels, SOA registrar, said he can't be of much help in determining record-holders since SOA computerized records don't exist prior to 1979.

Kinzer suggests that readers might want to comment on other potential record holders.

Money puzzler

Submitted by Hans U. Gerber

The currency of Country A is pounds, and the currency of Country B is dollars. At present the exchange rate is 1:1. We suppose that the exchange rate fluctuates in a symmetric fashion. To fix ideas, let us assume that the exchange rate at the end of the year will be either 1:2 (£1 = $2) or 2:1 (£2 = $1), each with probability 1/2. If an investor of Country A buys $1 (for the price of £1), the investor expects to have

$$0.50 \times 1/2 + 2 \times 1/2 = £1.25$$

at the end of the year, thereby making an expected gain of £.25. Likewise, an investor of Country B can invest $1 to buy £1, and the expected gain at the end of the year is $.25. Does that mean that all investors of Country A should buy dollars, and that all investors of Country B should invest their money in pounds?

Perhaps some of the readers of *The Actuary* have an answer why the investor should invest all the money in foreign currency.

Puzzle editor hands over reins

After more than 10 years of rounding up two puzzles each month for *The Actuary*, Charlie Groeschell, competition editor, is ready to take a well-deserved rest. Not only did this "retired" actuary arrange for volunteer art production of these pages, Groeschell authored the "Actucrostic" and graded each "Actucrossword" returned to him so he could recognize the "100% solvers."

Although in awe of Groeschell's remarkable talents and dedication, John Keller has agreed to temporarily fill the competition editor's slot.

"I was one of Charlie's first solvers when he started running Graham Deas' puzzles," Keller said. "Since then I've helped out testing puzzle answers and acted as a kind of sounding board."

Knowing fans might miss the "Actucrostics," Groeschell plans to continue to produce new ones occasionally. New "Actucrosswords" are being produced by Bob Hohertz, and updated repeats of Graham Deas' puzzles will be used as fill-ins.

Keller has just two things to say to puzzle fans: "If you'd like to try writing puzzles, here's your chance," and "Take my job, please." He is soliciting original puzzles, especially "Actucrostics," and a permanent replacement as competition editor. He would be glad to discuss either opportunity with those contacting him at his *Yearbook* address.

Library adds volumes

The following is a partial list of additions to the SOA library. Members may borrow library books by contacting the library, 708-706-3538 or 708-706-3575.

Circulating

Axtell, Roger E., ed., *Do's and Taboos Around the World*, 2nd edition, John Wiley & Sons, Inc., New York, 1990 (HF5387.D66)

Bartlett, Dwight K., ed., *Corporate Book Reserving for Postretirement Health Care Benefits*, Irwin, Homewood, Ill., 1991 (HD7102.U4C634)

Baynes, John & Maclean, Hugh, *A Tale of Two Captains*, The Pentland Press, Ltd., Edinburgh, Scotland, 1990 (D651.C3.B39)

Butler, Wilford A., ed., *Attracting, Organizing, and Keeping Members*, American Society of Association Executives, Washington, 1989 (AS6.A88)

Chatterjee, Samprit & Price, Bertram, *Regression Analysis by Example*, John Wiley & Sons, Inc., New York, 1977 (QA278.2.C5 1977)

Cohen, Jerome B., et al, *Investment Analysis and Portfolio Management*, 5th edition, Irwin, Homewood, Ill., 1987 (HG4529.5C6)

Copeland, Thomas E. & Weston J. Fred, *Financial Theory and Corporate Policy*, 3rd edition, Addison-Wesley Publishing Company, Reading, Mass., 1988 (HG4011.C833)

Devaney, Robert L., *An Introduction to Chaotic Dynamical Systems*, 2nd edition, Addison-Wesley Publishing Company, Inc., Redwood City, Calif., 1989 (QA614.8.D48)

Dove, Kent E., *Conducting a Successful Capital Campaign: A Comprehensive Fundraising Guide for Nonprofit Organizations*, Jossey-Bass Inc., San Francisco, Calif., 1988 (HG177.5.U6D68)

Elton, Edwin J. & Martin J. Gruber, *Modern Portfolio Theory and Investment Analysis*, John Wiley & Sons, Inc., New York, 1987 (HG4529.E47)

Library cont'd

Feller, William, *An Introduction to Probability Theory and its Applications*, Vol. 1, 3rd edition, John Wiley & Sons, Inc., New York, 1968 (QA273.F3712)

Gerber, Hans U., *Life Insurance Mathematics*, Springer Verlag, Berlin, Germany, 1990 (1 copy in English, 1 in German) (HG8781.G42)

Hall, Mary S., *Getting Funded: A Complete Guide to Proposal Writing*, Continuing Education Publications, Portland State University, Portland, Ore., 1988

Leimberg, Stephen R., et al, *Stanley and Kilcullen's Federal Income Tax Law: 1990 Edition*, Warren, Gorham & Lamont, Boston, 1990 (K4501.L4)

McCabe, Robert K., *Guide to Business Travel in Asia*, Passport Books, Lincolnwood, Ill., 1989 (DS522.6.M33)

Sharpe, William F. & Gordon J. Alexander, *Investments*, 4th edition, Prentice Hall, Englewood Cliffs, N.J., 1990 (HG4521.S48)

Steen, Lynn Arthur, ed., *On the Shoulders of Giants: New Approaches to Numeracy*, National Academy Press, Washington, D.C., 1990 (QA13.053)

Tiller, John E., Jr. & Denise Fagerberg, *Life, Health, and Annuity Reinsurance*, ACTEX Publications, Inc., Winsted & Avon, Conn., 1990 (HG8083.T55)

Wolthuis, Henk, *Savings and Risk Processes in Life Contingencies*, Faculty of Economics, University of Amsterdam, Academic Proofpaper, June 10, 1988 (HG8848.W65)

Futurism

Martino, Joseph P., *Technological Forecasting for Decision Making*, New York, North Holland, 1983 (T174.M38)

International

Bergelv, Lars, ed., *Sverige Reinsurance Company, 75 Years*, collection of papers on Swedish Life Insurance Industry, Tryckt hos Fyris-Trick Ab, Uppsala, Sweden, 1990 (uncataloged)

Hilton, F. Paul, *Investment Management for the 1990s*, a Paper for the Staple Inn Actuarial Society, 25th September, 1990, James Capel, London, 1990 (uncataloged)

Kok, Walter & Jaap Van Klinken, eds., *Liber Americorum*, collection of papers, Institute of Actuarial Science & Econometrics, University of Amsterdam, 1990 (uncataloged)

Urwin, Roger, MA, MSc, FIA, *Success in Investment Management – Identifying Tomorrow's Successful Manager Today*, presented to the Institute of Actuaries, Staple Inn Society, November 20, 1990 (uncataloged)

World Bibliography of Social Security, International Social Security Association 1990, Geneva, Switzerland, 1990 (uncataloged)

Reference

Canadian Almanac & Directory 1991, Canadian Almanac & Directory Publishing Co., Ltd., Toronto, 1991 (AY414.C2)

Canadian Life and Health Insurance Facts: 1989 edition, Canadian Life & Health Insurance Ass., Inc., Toronto, 1989 (uncataloged)

Gale Directory of Publications and Broadcast Media, an Annual Guide to Publications and Broadcast Media, 3 vols., Gale Research Inc., Detroit, 1991 (uncataloged)

Lew, Edward A. & Jerzy Gajewski, eds., *Medical Risks: Trends in Mortality by Age and Time Elapsed*, 2 vols., Praeger, New York, 1990 (RA407.3.M43)

LOMA Membership Directory, September 1990 - August 1991, Atlanta, 1990 (uncataloged)

Pension and Employee Benefits, Code-ERISA-Regulations as of November 5, 1990, 2 vols., Commerce Clearing House, Inc., Chicago, 1990 (uncataloged)

1990 Canada's Postal Code Directory, Canada Post Corporation, 1990 (uncataloged)

1990 Life Insurance Fact Book, American Council of Life Insurance, Washington, D.C., 1990 (uncataloged)

1990-1991 Membership Directory ACLI (uncataloged)

1990 Tax Facts 1: Life and Health Insurance Annuities, Employee Plans, Estates and Trusts, Business Continuation, NU Law Services, Cincinnati, 1990 (HG8912.T3)

Vertical File

Council of Professional Associations on Federal Statistics, *Annual Report 1989*, Alexandria, Va.

Gibbons, Ann, "Gerontology Research Comes of Age," *Science*, Vol. 250, Research News, pp. 622-625

Monitoring Attitudes of the Public, (MAP 1990) American Council of Life Insurance, 1990

Olshansky, S. Jay, et al, "In Search of Methuselah: Estimating the Upper Limits to Human Longevity," *Science*, Vol. 250, Nov. 1990, pp. 634-640

Publications cont'd

of money, and it periodically sent you mailings of research articles. The articles were not edited or refereed. The SOA charged your account for the cost of each mailing and sent you a notice when to send more money. Eventually, *ARCH* became a regular publication with a fixed subscription fee. The goal remains, however, for *ARCH* to be a convenient forum for informal publication of items of interest to actuaries.

The *Publications Index* Committee, the Committee on Review of Literature, and the Committee on Memorials are other publications committees that provide important services to members. Timeliness is a key issue for all SOA publications, but *ARCH* and the *Reports* volume of the *Transactions* are receiving special attention. Approval has been given to publish SOA committee reports of special interest in the *Reports*. Also, when there is a topic of current interest and importance, the SOA will consider publishing a special report.

Looking ahead

The Board is considering developing a newsletter for students taking the jointly administered Casualty Actuarial Society/SOA examinations. This would be an excellent opportunity to communicate with more than 10,000 students who represent the future of our profession.

Now that you know more about the publications area, I encourage you to tell me what you think about SOA publications. I will be glad to share your observations and recommendations with the various publications committees. Also, I encourage you to get involved with SOA publications, either by writing an article or by becoming a volunteer and serving on one of the committees.

Finally, I would like to thank the many volunteers and staff members who contribute so much time to publications and to our profession.

David M. Holland, an SOA Vice-President and Secretary, is President and CEO, Munich American Reassurance Company.

Dear Editor:

Opposed to lowering fertility rate

In his review of the Social Security Technical Panel's Report (*Actuary*, April 1991), Dwight Bartlett notes that the "most controversial of the demographic assumptions (used to project Social Security's long-range cost) has been the ultimate total...fertility rate, presently set at 1.9 children per woman..." The Technical Panel recommended no change in that assumption, although one dissenting member suggested lowering it to 1.7 children per woman. Unfortunately, readers were not provided with any context in which to judge these figures.

The total fertility rate in the United States reached its modern peak of 3.7 in 1957, roughly the middle of the so-called baby boom. It then dropped almost continuously to 1.75 in 1976. After a decade hovering in the low 1.8 range, the rate began rising in the mid-1980s. It exceeded 1.9 in 1988, 2.0 in 1989, and may round to 2.1 in 1990. This is consistent with a theory that I put forth in 1980, that the low fertility rates of that time resulted partly from delays in childbearing by baby-boomer women, exaggerating the actual decline in lifetime fertility. As these women have continued to have children in their late 30s and 40s, the total fertility rate has risen to roughly the replacement level of 2.1.

While at the Social Security Administration, I argued against lowering the assumed total fertility rate from 2.1 to 2.0, and I argued against lowering it from 2.0 to 1.9. I do not believe that the present assumption of 1.9 is unreasonable, but 1.7 certainly would be.

Bruce D. Schobel

Proofs that 1 = 2

This is in response to Leonardo Aguinaldo's letter to the editor in the April *Actuary*, concerning proofs of 1=2.

This proof (Banach-Tarski) also relies on the use of infinity, not the countable infinity of the integers as in an infinite series, but the higher order infinity of the real numbers. You cannot have successive real numbers since, for any two real numbers, there are infinitely many real numbers between them.

In this realm the usual notion of counting can lose its meaning. For example, the real number segment [0,1] can be mapped one-to-one and onto the real number segment [0,2], namely $f[x]=2x$. (Is this another proof that 1=2?) At the same time, the measure (as used in probability theory) would be twice that of [0,1].

So how "large" a set is, in mathematical real 3-space, should be determined by its measure, not by the measure of other sets it can be mapped to. A friend with a Ph.D. in mathematics says the "pieces" in the Banach-Tarski paradox have the interesting property that their measure is not uniquely defined.

Jim Beauchamp

Double or nothing

I must confess total ignorance of the Banach-Tarski paradox which Leonardo Aguinaldo (April 1991 *Actuary*) used to prove that 2=1. I do, however, have an elementary proof drawn from a statement in his letter: "If one could only double this gold bar by some means, then one would double his profits."

Assume the gold was bought for B and can be sold for S, leaving a profit of $S-B$. If the gold is doubled, the profit is $2S-B$ which from the above statement $=2(S-B)$. From this, $2B=B$ or $2=1$ (B not=0).

If $B=0$, either the gold is free and there is no need to double it, or there is no gold and hence no problem doubling it.

Don Keith

Simplify mission statement

A mission statement should be simply stated and easy to remember. I have a suggestion for an alternative to the mission statement proposed by the Actuary of the Future Task Force. This was reported by Bob Shapiro in the June *Actuary*.

My suggestion is as follows:

Mission – Actuaries analyze and manage the financial consequences of risk.

If we wanted to expand the horizons of actuaries, our mission statement could be:

Actuaries analyze and manage the consequences of risk.

Steve Radcliffe

Traditional symbol cited

I noted in the May *Actuary* that J. Bruce MacDonald had not seen the c_x symbol. This symbol was used in a textbook that I first saw in 1952, probably published in 1950 or earlier. The book was *Life Insurance Mathematics* by Robert Larson and Erwin Gaumnitz. That symbol was used along with the little used u_x symbol in calculating life insurance reserves retrospectively, using the Fackler Accumulation Method.

Charles Moore

* * *

I hesitate to extend the dialogue on what many may think is a rather trivial notational point, namely the use of the symbol c_x as an alternative for $A^1_{x:\overline{1}|}$ or C_x/D_x. It may be worth correcting a misconception.

It has been suggested that actuaries who have not studied life contingencies from my textbook would never have encountered the symbol c_x. While this is true of today's students using the current textbook, it is not true of older actuaries who passed the life contingencies exam before my book was published. Then the syllabus required reading two papers by W.O. Menge (RAIA 25 and 35) on preliminary term valuation methods in which c_x consistently was used in describing the different methods. That is where I first encountered it and, because of its simplicity as compared with $A^1_{x:\overline{1}|}$, I found it most useful in treating the preliminary term methods in my book. Although I do not know the origin of c_x, I am sure that for many years it was a traditional symbol, at least in the context of preliminary term valuation.

C.W. Jordan

Opposed to exam credit

Since the "alternate route" was proposed in the mid-1970s, *The Actuary* and other publications have included considerable debate about examination credit for university courses.

I am very opposed to the idea. The main reason is that I fear this will be the first step toward requiring university courses for membership in the Society of Actuaries. I have never seen this reason appear in print or heard it expressed by any other actuary. Robin B. Leckie stated in his editorial in the February *Actuary*: "...The universities ought to be our

Continued on page 14 column 1

Dear Editor *cont'd*

only route for the bulk of the Associateship qualification."

The reason I believe this would be wrong may be rather personal, but might apply to some other actuaries. I love being an actuary. The actuarial profession has given me the opportunity to perform work that I find exciting, interesting, and challenging. I have participated in and enjoyed various Society activities. I have done some research in actuarial subjects and intend to contribute more ideas to actuarial knowledge.

Yet, if university courses had been required for membership in the Society, I probably never would have succeeded. I and many other members of the Society might have had difficulty in being admitted to a university's actuarial program or had trouble paying the tuition.

Furthermore, the school setting involves judgement by individual teachers who may be subjective or even prejudiced. Often students who can pass examinations may be so disliked by their professors that they cannot obtain good grades in school courses. These same students may make important contributions to the profession.

Many actuaries may say we never will require course work for admission to the Society. Yet, I believe that we are the only profession left that allows students to become members without having passed a minimum number of university courses. There was a time when individuals could take the CPA examinations or the Law Board examination without taking any courses. Now, course work is required and no exceptions are made. Perhaps this occurred because universities have a financial incentive in not allowing students to bypass course work. Why will our profession be any different from the others?

I think that it is not the better prepared students that are asking that we give credit for courses passed. More likely, it is the universities who want more control over actuarial careers. I am not opposed to greater cooperation between the Society and academic institutions. In fact, I think the Society should increase its promotion and funding of research.

Chuck Fuhrer

Crisis needs to be addressed

If you asked me, "What was the most significant event affecting your profession and your company in the 35 years that you have been an actuary?" I would reply without hesitation, "The seizure of Mutual Benefit Life (MBL) by the State of New Jersey." On July 12, 400,000 policyholders of MBL read in the newspaper that they no longer had access to their funds and they would be unable to exercise many of the provisions of their contracts. To these policyholders and to the actuarial profession, this has to be a catastrophe of the highest order.

I recently glanced at the program for the coming annual meeting, and I saw no mention of the solvency and confidence crisis facing our industry. In my view, this crisis is now the highest priority item on the actuarial agenda and should be promptly addressed.

Several questions occur to me. State regulators exist for the principal purpose of protecting policyholders and the public. How well are they doing this job? Are new laws required for the limitation and valuation of speculative junk bonds, real estate, and other assets? Would earlier intervention and better auditing of asset values have prevented the MBL fiasco? Is there a role for federal regulation?

Has public confidence in the insurance industry been irreparably damaged? Is a purely defensive posture (the ACLI ads) the best approach?

Is the guaranteed interest contract (GIC) an insurance product or a speculative investment product? In hindsight, how much has been made or lost on this contract in the past 10 years? What has been the impact of the GIC on all policyholders and stockholders?

We actuaries have spent much time developing fancy computer programs to match assets and liabilities and analyze GIC profit flows. Should we be spending more time reviewing well stated theories of "actuarial soundness" and basic insurance principles?

What should the role of the actuarial profession be in resolving the crisis? How can we improve our performance in the future?

I don't presume to know the answers, but I believe these questions need to be promptly and thoroughly addressed.

Howard L. Wachspress

Editor's note: Mike Cowell's article, "Right questions – wrong answers," on page 4 of this issue discusses the concerns expressed in the preceding letter. In addition, many of these issues will be discussed in Session #15 at the annual meeting in Toronto. This panel discussion, "Mandated Risk Based Surplus," is scheduled for 2-3:30 p.m. on Monday, October 21.

Changes in PCs fewer in '90s

Since January 1990, I have been teaching computer science at Triton College and my thoughts on PCs might interest you.

Many would say the PC revolution started with Apple. I would contend that the PC is not a technological discovery so much as it is an innovation. I say this because college students, not engineers or research scientists, made the first Apple out of readily available parts. The rapid advance in PC technology in the 1980s is largely, in my view, bringing PCs up to par with other areas of scientific endeavor. My expectation is the 1990s will show much less change in PCs than the 1980s did.

I recently bought a 386SX computer with a coprocessor. The coprocessor cost me only $120. With it, I expect a 386SX will have about the same computing power as a 386/33 for a lot less money. The extra power the 386/33 has for loading programs is overkill for actuarial applications. Also, 33 megahertz microprocessors have been known to skip some of the instructions in a program while it is running. A 386SX has a low enough clock speed, so that is much less of a concern.

John C. Martin

Meet the Board

The "Meet the Board" session at the annual meeting is an opportunity for members to get to know SOA Board members on a personal, informal basis. This year you can meet the Board in Toronto for breakfast, 7:30 - 8:30 a.m., Tuesday, October 22. Here's your chance to discuss current activities and suggest new ideas to Board members.

In memoriam

Richard E. O'Keefe, FSA 1938
Susan Schneider, ASA 1991
Harold L. Rosini, ASA 1950

ACTUCROSSWORD

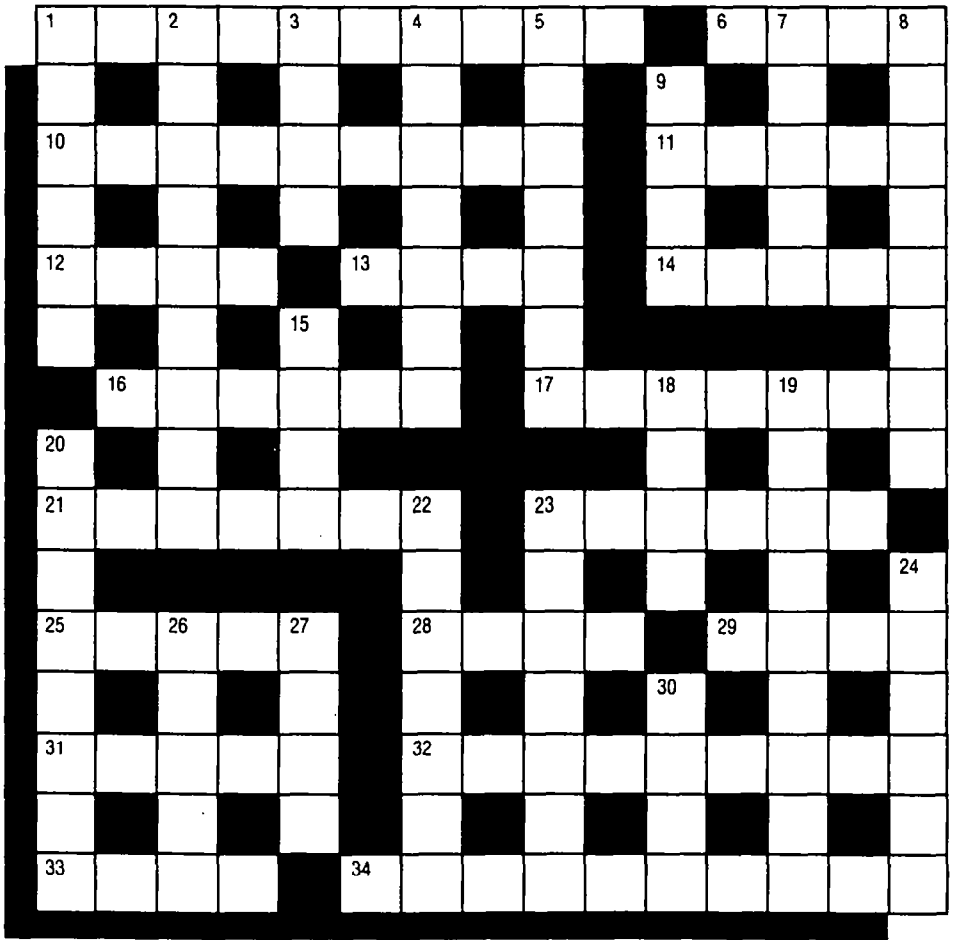
by R. Graham Deas

Across

1. Hire purchase-two articles. Foster home trickery (5,5)
6. This bit and parcel an essential ingredient (4)
10. Laguna lady follows good golfer, becoming Pan princess (5,4)
11. Engagement ring (5)
12. Back and forward to Great Emperor (4)
13. Note different sound (4)
14. His contacts were valuable (5)
16. Russian music connection in Georgia (6)
17. He tilts at a form of aster (7)
21. Red spots are bull disorder (7)
23. This superb drink can send one into a trance (6)
25. Nip of cheesecake (3,2)
28. Tour thrown into confused flight (4)
29. Is continent if back in non-drinking group (4)
31. Baby carrier? (5)
32. Vital prey exclusive (9)
33. Fare that is in a state of delirium tremens (4)
34. Wielder of hatchet was upsetting nothing (10)

Down

1. Animal expression of delight at nourishment (3,3)
2. Dark suit for this place of entertainment (5,4)
3. In New Jersey or Kansas with town in Virginia (4)
4. Its capital was resurrected from ashes (7)
5. Solution by direction, yet skew in Florida (3,4)
7. Improve afternoon (5)
8. Side rest adjusted for driver (8)
9. Injury not agreeable unless taking on IOUs (4)
15. Color of English article and French pronoun (4)
18. Distance achieved by bird without banter (4)
19. Somehow entrant is passing (9)
20. Expert assumed stance for insurance (9)
22. Roman silver, requiescat, Pennsylvania (7)
23. Foster in the sin hour (7)
24. Preserve that ravine (6)
26. One so makes this form of security (5)
27. Weapon attaining peak in Colorado (4)
30. Tale of a textile (4)



In the May Graham Deas puzzle the clue for 28 down was "Flower love in this cape." Several of you questioned the rationale for the answer, which was "idle." Love-in-idleness is a flowering plant. So we have a flower - love-in-idle(this)ness(cape). - C.E.

September's Solution

T	I	N	C	A	N		A	S	P	I	R	A	T	E	S
N		A		A		N		I		A		E		W
U	T	T	E	R	A	N	C	E		S	A	M	O	A
N		E		C		A		D		G		P		R
D	A	R	W	I	N		V	A	G	A	B	O	N	D
A		S		B		T		L		R				
T	A	P	E	S	T	R	I	E	S		L	I	M	B
E		R		T		O		R		S		S		E
D	O	O	M		F	O	U	R	W	H	E	E	L	S
		V		S		M		E		A			T	
G	R	E	A	T	E	S	T		A	N	C	H	O	R
E		N		R		T		P		G		O		E
N	E	D	O	A		I	R	I	S	M	S	T	E	W
I		E		I		C		E		A		E		E
C	A	R	E	T	A	K	E	R		I	D	L	E	D

Send solutions to: Competition Editor, 209 N. Comanche Lane, Waukesha, WI 53188

ACTUCROSSWORD

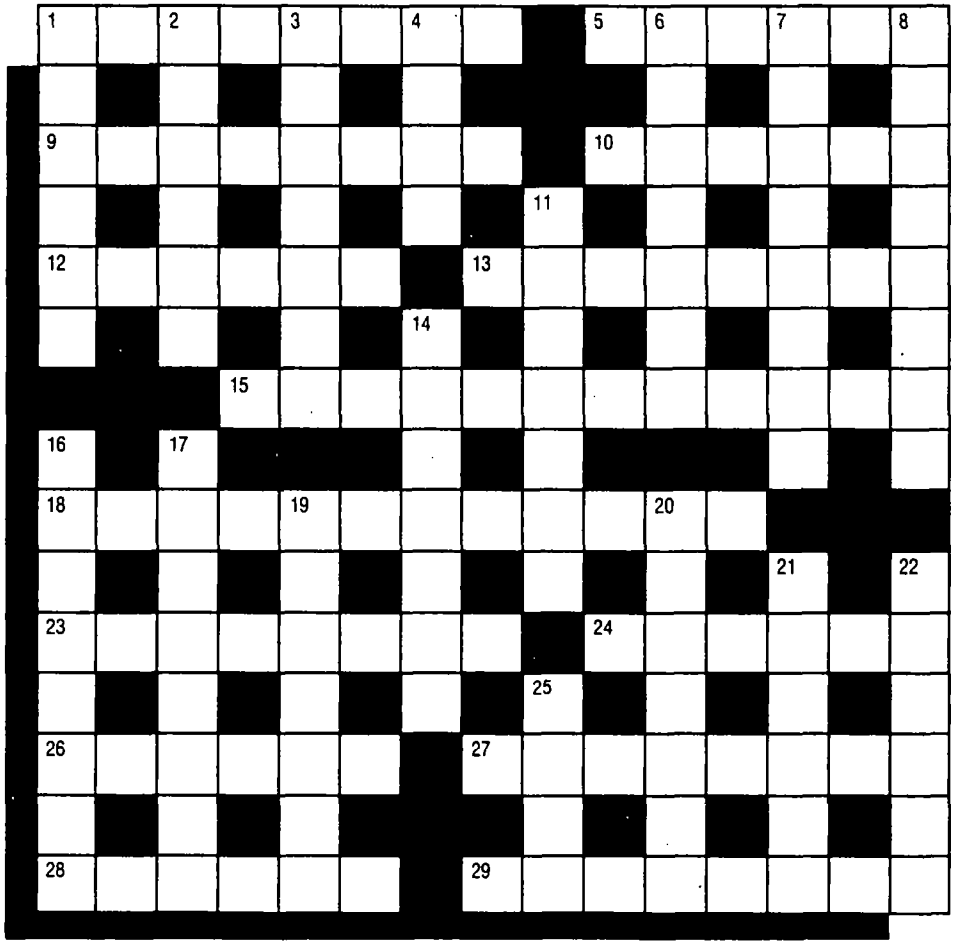
by Bob Hohertz

Across

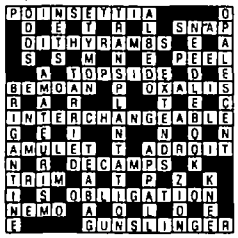
1. Shed trite ideas - plagiarize! (8)
5. "Cheers" - the positive aspects to it (6)
9. Alewife due to be tailed (8)
10. In which he and she are ready for the auditor (6)
12. The stupid angle? (6)
13. Five "Anitra's Dances" - all different versions (8)
15. Leda's lover, drunk, with clipped oath threatened Abu Simbel (5, 4, 3)
18. Early calculator found in logman's grave (7, 5)
23. Final in geometry or midterm in algebra (8)
24. Go for it - use credit! (6)
26. Circle or parallel, responding to a stimulus (6)
27. A North American foundation forms an expedition (8)
28. Bad behavior in Fido? Try giving a tranquilizer (6)
29. I add it, or mush the huskies for it (8)

Down

1. Sometimes all of creation flowers (6)
2. Return express fifty to the theater district (6)
3. Arranging score, we come up with "Last King of Lydia" (7)
4. I am an unknown goat! (4)
6. Pulling in fish, in a circle (7)
7. Possibly Hamlet rising in dry night air (8)
8. Prolix old book containing furies (8)
11. Give shape to rage (7)
14. Venus as Lucifer - on the soaps? (7)
16. Tacit, like Philip Nolan (8)
17. Urge on promissory notes? False! (8)
19. One to 25 can become an issue (7)
20. Hit four gotten ready for the show (7)
21. Times about backward rubber (6)
22. Sealed off and let out (6)
25. Eat up, lady! (4)



September's Solution



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