



The Newsletter of the
Society of Actuaries

VOL. 24, NO. 8
SEPTEMBER 1990

THE Actuary



James M. Souness

Interview with Faculty of Actuaries President

Linda B. Emory, Editor of *The Actuary*, recently spoke with James M. Souness, President of the Faculty of Actuaries in Scotland and Managing Director and Chief Executive of The Life Association of Scotland, about the differences between the Faculty of Actuaries in Scotland and the Institute of Actuaries, and other issues facing the profession in Europe.

Question: You have two major actuarial societies in the United Kingdom – the Faculty of Actuaries in Scotland and the Institute of Actuaries. Why have you retained the separation of the profession? Are you able to speak with one voice on issues of interest to the profession?

Souness: The Institute is older by a few years. Actuaries' credentials in both societies are equal. Fellows of the Faculty and the Institute work

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Strengthening relationships between universities and the actuarial profession

by Allan Affleck

In early 1989, the Society of Actuaries appointed a Task Force on Strengthening Relationships between Universities and the Actuarial Profession. Donald Sondergeld, SOA Vice President, served as chairperson of that task force. The charge to the task force was:

To explore the relationships between the actuarial profession and universities in the United States and Canada and to recommend how they can be strengthened to the benefit of both the actuarial profession and the universities.

At its June 1990 meeting, the Society of Actuaries Board of Governors considered the

recommendations of the SOA Planning Committee, based on the initial recommendations of the task force. The objectives of the recommendations were: to foster two-way communication between the SOA and its academic members by encouraging them to participate more fully in SOA activities, to encourage academic contributions at SOA-sponsored meetings, to encourage those involved in actuarial education to attain the ASA and FSA professional designations, and to provide some financial support for the development of education and research programs in actuarial science.

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Linda B. Emory



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Relationships cont'd

The Board of Governors has approved implementation of the following:

- For a five-year period, beginning in the 1990-1991 academic year:
 - waiver of SOA meeting and continuing education seminar fees for full-time academic SOA members
 - reimbursement of committee and Board expenses incurred by full-time academic SOA members
 - reimbursement of travel expenses to all full-time academic SOA members for participation in SOA meeting programs as panelists, moderators, or in comparable roles
 - one-time grants to educational institutions of \$5,000 at the time a full-time faculty member attains FSA status
 - one-time grants to educational institutions of \$2,500 at the time a full-time faculty member attains ASA status.
- In the 1990-1991 academic year, creation of up to five annual \$10,000 renewable scholarships to Ph.D. candidates with thesis topics in areas related to actuarial science.

The Ph.D. study grants will be awarded on a competitive basis and will be renewable up to three times. Preference will be given to students who are (or are working toward becoming) members of a North American actuarial body. We anticipate the scholarship program will be available beginning in the 1991-92 academic year.

The Board also approved the following additional recommendations:

- Suggest to academic members that a separate academic section be formed within the Society of Actuaries. (The Board believes the creation of a section should be a "bottom-up" decision based on the wishes of academic and other interested SOA members. Such an effort by interested members is already under way.)
- Ask the Continuing Education Policy Committee to examine developing continuing education courses and teaching sessions based on specialty areas of current academic members, and to consider using academic faculty when possible in continuing education programs.
- Ask the Program Committee to consider improved procedures for the recognition and discussion at

SOA meetings of papers accepted for publication in the *Transactions*.

- Ask the Education Policy Committee to examine the feasibility of creating a flexible examination administration system which would allow for administration of SOA examinations on dates more convenient to individual universities and colleges.

Warren Luckner, SOA Research Actuary, is serving as staff liaison for the implementation of these initiatives. If you have any questions, please contact Warren at 708-706-3572.

These efforts are just a beginning. Strengthening relationships between the Society of Actuaries and the academic community is an ongoing process. Other related recommendations are being considered by the SOA Board.

I strongly support these initiatives. I believe they represent progress in our efforts to achieve mutually beneficial interaction of the academic community and the actuarial profession. It is essential that our profession have strong ties to its academic roots if we want to continue to develop new ideas and be relevant in the future.

Allan Affleck, SOA President, is a Consulting Actuary with Milliman & Robertson.

Early-release copies of TSA papers

The following papers have been accepted for publication in Volume 42 of the *Transactions*. Members who would like to obtain an early-release copy of a TSA paper before it is published in a preprint may do so by sending \$5 for each paper to the Books & Publications Department at the Society office, 475 North Martingale Road, Suite 800, Schaumburg, IL 60173-2226.

"Pricing of Accelerated Benefit Plans," by James B. Keller

"Cash Flow Matching and Linear Programming Quality," by Dr. Rama Kocherlakota, Dr. E.S. Rosenbloom, and Elias S.W. Shiu

Interview cont'd

together in companies and consulting practices. It is not sensible to approach the British government on two fronts. Therefore, there are many joint committees through which professional dialogue is carried out. The chairperson of a joint committee alternates between a Faculty representative and an Institute representative. Joint committees report to the two councils and must have formal council approval before they act.

Nine Scottish life offices control about 20% of the U.K. life market, and they find it beneficial to maintain the separate Faculty. These companies operate in a close geographical area, and the Faculty has a close relationship with the local universities. The Chair of Actuarial Maths program at Heriot-Watt University works in close conjunction with the companies. There is a difference in the educational philosophy of the Faculty and the Institute – the Institute allows specialization in the later parts, whereas the Faculty follows the historical Scottish system of general training. Having a second actuarial organization the size of the Faculty means a high proportion of its members must volunteer to the Faculty. At the end of 1988, the Faculty had 667 Fellows and 489 students.

(Editors Note: The Institute of Actuaries had about 7,800 Fellows and students.)

Question: How do you become President of the Faculty?

Souness: The President's Committee is made up of the two past presidents, existing president, senior vice presidents, secretary and the treasurer of the Faculty. It nominates a person to become the Junior Vice President, who usually becomes the next President. I had just finished a term of office as Hon. Secretary when I was asked to stand for Junior Vice President. The slate is voted on at the meeting and nominations from the floor are accepted.

Question: How time-consuming is it to be the President of the Faculty? Do you have a permanent staff? What do you enjoy the most?

Souness: It takes considerable time. We have a full-time Executive and supporting staff. I enjoy the requirement to be informed – this is very stimulating

Question: What issues are currently receiving the greatest attention of the Faculty of Actuaries? What role does the Faculty and professional groups in different countries have in the development of the directives for establishing the European Common Market for insurance? Do you see the EEC moving to something similar to the state regulation of insurance in the United States with coordination of state regulation through the National Association of Insurance Commissioners?

Souness: One of the issues currently receiving attention is the impending Life Directive of Europe, which is constantly on our agendas. The life and nonlife insurance directives are being formulated in Brussels, and among other things they address regulation and supervision. Extremes possible are: to accept all existing supervision by mutual recognition, or to fully harmonize all supervision



(such as standards for reserves and possibly direction of asset investments). The United Kingdom hopes the movement is nearer to recognition than standardization because this is more compatible with the U.K. system of setting minimum standards and allowing the actuary flexibility within those standards.

The European actuarial societies are members of a body that has dialogue with the commissioners in Brussels. The U.K. Faculty and Institute are important members of this body. The Consultative Group of Associations of Actuaries in the Countries of the European Communities. The Groupe's committee structure includes an Insurance Committee covering both life and nonlife insurance, a Pensions Committee dealing with national insurance and occupational pensions, and a Freedoms and General Purposes Committee. There also is a Joint European Committee of the Faculty and Institute that works

with the British Department of Trade in presenting the U.K. case. Possibly, the ultimate course will be similar to that in the states

Other professional issues currently receiving attention include:

- European recognition of other actuarial diplomas. There is already a Directive on a General System for the Recognition of Higher Education Diplomas Awarded on Completion of Professional Education and Training of at Least Three Year's Duration which has been adopted by the European Council and will be operative in 1991. The Groupe Consultatif is currently discussing practical aspects of this directive
- New U.K. pension legislation brings an additional requirement to upgrade private sector pensions to reflect increases in the cost of living (subject to a maximum of 5% per year). The details apply differently to service before and after an appointed day and relate to the disposal of Pension Fund surpluses. Further Guidance Notes are necessary *(Editor's Note: Guidance Notes are published standards by which the Fellows of the Faculty and Institute work. They are placed in three categories – mandatory, best advice and advisory.)*
- Dialogue with accountants regarding standard accounting practice SSAP 24 on how to account for pension costs and what to do with funding and surplus.
- The Department of Trade has proposed that the Appointed Actuary (which has statutory requirements) be separately licensed. Currently the Appointed Actuary is only required to be a qualified actuary.
- A major review of the educational system is under way. The Faculty is considering adding general insurance topics and updating and refreshing the curriculum. We give some exemptions for college credit already, but there are high standards with approval by an Exemption Committee and required use of examiners external to the college.

Question: What are the issues currently receiving the greatest attention in the insurance industry?

Souness: (1) The Financial Services Act which regulates all selling of investment and life company products (2) Pension legislation

Interview cont'd

(3) Taxation of life funds (The authorities have been agitated for some time on these matters, including ways of creating a level playing field in financial markets. Consequence could be the movement to shorter-term savings, whereas the industry believes that longer-term insurance products are in the best interest of the public.)

Question: How do the Faculty meetings differ from meetings of the Society of Actuaries?

Souness: The Faculty has four or five sessional meetings for papers to be presented and debated. Also, there are seminars on special subjects when there are changes in practices — pensions, investments, taxes, special products. Every year or two, there is a large Joint U.K. Convention — these alternate between pension and life topics and have break out sessions similar to Society meetings. The greater complexity of actuarial work and the rate of change in procedures are causing changes in the needs of the members of the profession. Actuaries are taking stock more often and need more opportunities to refresh and update knowledge.

Question: Does the Faculty have continuing education requirements?

Souness: There is no formal requirement, but the question is currently on the table. We have a Professionalism Course that we're thinking of making mandatory. Now, almost all of our members take it by their own election. Our younger actuaries are encouraged to join one of our five research groups: pensions, mortality, valuation, Europe, and marketing. These groups work together to produce papers. Three out of the five papers being presented at meetings this year have come out of these research groups. Examples of those papers include "Future Shape of Pension Benefits," "Policyholder Rights in Various Events," and "The Image and Reputation of the Actuary as Regarded by the British Public."

Question: Why do you limit the time a student may retake examinations? What happens to a student who must stop taking the examinations?

Souness: A student has his name removed from the roll after four failures at any part of the examinations. These people are wasting their own time retaking the examinations so often. These people are usually invaluable to the company where they work and find their own place.

AFIR colloquium in Paris

by James A. Tilley

The Actuarial Approach to Financial Risks (AFIR) Section of the International Actuarial Association (IAA) was officially formed at the 23rd International Congress of Actuaries in Helsinki in July 1988. By the end of 1989, AFIR already had 1,200 members, with approximately 6% from Canada and 25% from the United States.

The first AFIR colloquium was held this year in Paris from April 23-27. Approximately 500 delegates from 37 countries attended, including 15 from Canada and 30 from the United States. The program featured opening and closing ceremonies, five "scientific" half-day sessions, a wrap-up roundtable discussion, and a business meeting of the AFIR section. Delegates were invited to a reception at Paris's palatial city hall. About 700 delegates and accompanying guests attended the closing dinner at the famous Conciergerie that housed prisoners during the French Revolution. A fitting end to the colloquium was a concert of the National Orchestra of France at the Theatre des Champs-Élysées. Throughout the colloquium, accompanying guests were treated to fashion shows, panoramic tours of Paris, visits to Musée du Louvre, and a full-day excursion to Monet's house at Giverny.

Although the attractions of Paris were interesting, the primary purpose of the colloquium was scientific. A call for papers was issued in late 1988, and more than 80 were submitted. A committee of professors from the schools of finance and business at France's distinguished universities reviewed all submissions and approved 64 for publication in the four volumes of the colloquium proceedings. Papers could be submitted in either French or English and the abstracts were printed in French if the paper was in English and vice versa.

The five half-day sessions each began with an invited lecturer, followed by a 45-minute presentation by the chairperson who critiqued, discussed, and summarized the various contributed papers falling under the theme of the session. Contributors commented about their own papers and participants asked questions or added commentary.

The Tuesday morning session concerned risks faced by financial institutions and began with a presentation by Professor Andrew Thompson (U.S.) entitled, "An Actuarial Analysis of Post-deregulation Thrift Failures in the USA." The afternoon session was devoted to the management of interest rate risk and featured a lecture by Robert S. Clarkson (Great Britain) on "The Measurement of Investment Risk," in which a critique of modern portfolio theory was given and a replacement model offered. Clarkson's presentation provoked considerable debate.



The theme of the Wednesday morning session was new financial markets, instruments, and techniques. Wolfgang Buhler (West Germany) presented an historical analysis of how portfolio insurance would have fared in the German bond market during the past 10 years, and Professor Michel Crouhy (France) demonstrated a binomial model for valuing warrants that takes explicit account of the dilution caused by exercise of the warrants. Portfolio management was the theme of the afternoon session. Andrew Perrins (Great Britain) described a simplified approach to portfolio insurance in the share markets (interestingly labeled "E = MC") and David Wilkie (Great Britain) described the general process of portfolio management and summarized the key points of his contributed paper.

The Thursday morning session was devoted to all papers not fitting under any of the other specific themes. Greg Taylor from Australia presented his paper, "The Rate of Return for Discounting Nonlife Insurance Reserves." The afternoon round table was chaired by Gerard Pfauwadel, president of the Matif, the French futures and options exchange. Representatives of France, Great Britain, and the United States discussed how the subjects presented at the colloquium applied to actuarial

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Actions of the Board of Governors

June 13, 1990

San Francisco, California

1. The Board adopted several proposals to strengthen relationships between universities and the actuarial profession, encourage academic involvement in Society activities, and promote actuarial teaching and research. These include:

- awarding scholarships to Ph D. candidates with thesis topics in actuarial subjects,
- waiver of Society meeting and seminar fees for academic members,
- reimbursement for academics of expenses of participating in Society committees and meeting programs, and
- grants to educational institutions for faculty members attaining ASA or FSA status.

2. The Board heard a report of a recent study which revealed that travel time through the Associateship examinations has increased slightly since the introduction of the Flexible Education System (FES) because candidates are attempting fewer credits under FES. But the study also showed that strong candidates are not being slowed down by FES. Details of this analysis will be appearing in *The Actuary*, and further studies will be made as additional experience develops.

3. Ratifying an action taken at the Society Executive Committee meeting on March 22-23, the Board approved the publication of a Society annual report as an issue of *The Actuary*, to be distributed about December 1. Designed to enhance communication between the Society leadership and membership, the report will feature a review of Society activities during the past year and a look ahead to the coming year.

4. The Board approved several recommendations for managing the funding of the Society's research initiatives.

5. The Board approved exploration of a proposed Society of Actuaries Foundation that would attempt to secure individual and corporate contributions to enhance the Society's research and education efforts.

Anthony T. Spano,
Secretary

Management, Disney Style

by Charles Wittenberg

When you see the phrase, "Management, Disney Style" thoughts may enter your mind of Snow White telling the seven dwarfs they must hurry to work or the Sorcerer's Apprentice giving instructions to the broom. Or, you may picture three polite costumed employees keeping 300 people calm and entertained as they wait an hour or more to ride on one of the Magic Kingdom's more popular rides

When you see the phrase, "Management, Insurance Style," you may picture highback chairs, slant-top desks, green eyeshades, and no conversation. You also may picture brightly lit areas with area dividers, tilt-screen computer terminals and soft background music. Or, you may think of employees eager to find ways to do their jobs better, and able to communicate this information, both laterally and upward, in order to do a better job for your insureds and your beneficiaries.

How can the success of Disney relate to actuaries' efforts? Since 1986, Disney has offered three-day management seminars. The Society's Committee on Management and Personal Development has arranged for a special one-day seminar on Friday, October 12, 1990, preceding the annual meeting. This session, put on by Walt Disney World Seminar Productions, will give participants a sample of Disney's management approach. A follow-up workshop, on Monday, October 15, during the annual meeting will discuss how the Disney concept can be applied to participants' lives and/or brought back to their employees.

The difference between a Disney seminar and other seminars is that Disney "shows," rather than simply "tells." Attendees actually go behind the scenes, underneath the Magic Kingdom, to observe the operations in action. Rick Johnson, Manager of Business Seminars, said a Disney seminar is not going to say, do these 10 things. "We say, 'You're interested in Disney, we're going to share it with you.' We say, 'Look beyond the veil we have created and you see the quality principles at work.' All of our systems are support systems. If one breaks down, it can ruin a visit."



The morning session of "Management, Disney Style" will deal with four major aspects of the Disney management:

- Corporate culture – The Disney beliefs, values, and traditions will be examined. You will explore the way Disney's corporate culture is expressed in attitudes toward quality, cleanliness, value, entertainment, fun, innovation, fantasy, and team work.
- Training – This process is used to introduce the Disney corporate culture to new "cast members" (you call them employees). You'll see an actual orientation film and quiz questions used in the training of Disney's new employees.
- Communication – Participants will see how Disney Management transmits messages to, and receives feedback from, its cast members.
- Caring – You will examine the attitude and actions of the management team that make the overall work experience rewarding, stimulating and personally satisfying. Interactive discussions in small groups also will be facilitated by the program presenter. One attendee said, "The way they care for their people, and the way they deal with them and their problems, has direct relevance for a lot of managers no matter what the business you're in."

The afternoon session "Innovation in Action" will be a behind-the-scenes view of the Walt Disney World resort. Participants will visit such areas as the utilidor (the network of tunnels beneath the Magic Kingdom park), energy plant, and the world's largest working wardrobe.

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Editorial

I've seen London...I've seen France...

by Linda B. Emory

It is early morning in the London City Airport. I am awaiting my flight back to Amsterdam. My route to the airport from my hotel near the Tower Bridge was by watertaxi down the Thames – the same way ships once left London to sail out to sea. This reminds me how faster transportation and communication have changed the world – even the actuarial profession. I am back in Atlanta after serving for two years as International Actuary for the largest company in the Netherlands (which has insurance operations in 22 countries including the United States and Canada). The actuarial world is shrinking. Many other actuaries have had international experiences similar to mine, and many more will have such opportunities in the future.

Last night (June 4), I attended a traditional "sessional" meeting of the Institute of Actuaries in the historic, church-like hall of the Staple Inn in London. The paper presented was "The Valuation of General Insurance Companies." The authors are not only FIAs – one is an ACAS and MAAA and the other an ASA. They work for a consulting firm which has branches and affiliates in North America, the United Kingdom, the Netherlands, and many other countries. American actuaries (even life actuaries) would have felt very much at home with the discussion.

I had dinner with several actuaries who work for another actuarial consulting firm which has affiliates in many countries. One of these actuaries will be coming to Chicago soon for a one-year exchange program. It is becoming common practice for international companies and consulting firms to give their North American actuaries exposure to other cultures, other insurance and financial service markets, and other tax and regulatory environments.

For two years, I have been able to serve as Editor of *The Actuary* while living in Continental Europe. This is mostly thanks to the excellent staff in the Chicago office and the

Associate Editors who are entirely responsible for their own issues. It is remarkable how easy it is to do business across continents and oceans these days – thanks to the facsimile machine, telephones and overnight mail (not to mention computer hook-ups via fax and phone). In April, the Society office made contact with me in Switzerland and France, and with Allan Affleck in Japan to handle a matter. The actuarial world is definitely shrinking!

In April, it was my privilege to attend the first meeting of the Actuarial Approach to Financial Risks Section of the International Actuarial Association in Paris. (Jim Tilley has summarized the meeting in this issue of *The Actuary*). This meeting had much participation from the academic community and was more technical in nature than North American actuarial meetings.

I observed that European actuaries seem to have an academic focus and a narrower, traditional technical role than North American actuaries. In the Netherlands, it is not uncommon for econometricians to perform the work actuaries do in North America. This reminds me of the actuarial profession in America in the 1960s before double-digit inflation and interest rates helped make our products more complex and the profit margins thinner.

I believe this role will change rapidly in Europe. A more common market (or consideration of a common market) is bringing new products, higher interest rates, more competition, less rigid regulation, and changes in the tax laws. Universal life and unit-linked (variable) products are being imported from the United Kingdom and North America as regulation permits. This causes changes in product design and profit patterns. Profit loads can no longer be implicit. Profitability must be analyzed using realistic assumptions by duration and by the techniques that are familiar in the United Kingdom and North America.

I predict that European actuaries will become even more in demand and valued for their unique and specialized training. We North American actuaries also could benefit from applying some of the fine technical work being done in the academic communities.

As I return to North America, I am more aware than ever of the level of guarantees and options in our products and the assets that back them. The United Kingdom seems to be maintaining a more reasonable level of profitability, without such risky provisions, despite sophisticated customers and products. Where will the greater deregulation and competition with other financial services take us? Are our shareholders getting a reasonable return for their risk in the American insurance industry? Are we really protecting our policyholders?

There will be times when I will long to return to the seemingly "kinder and gentler" insurance environment that I have observed in these past two years. But, how long will this environment persist? James Souness, President of the Scottish Faculty of Actuaries, states, "The greater complexity of actuarial work and the rate of change in the way things are done is causing changes in the needs of members of the profession." (See his interview beginning on page 1.) With such changes, actuaries are sure to be stimulated by shared experiences beyond country borders.

As companies become eager to spread their risks and enhance their profits through international operations, actuaries' knowledge of those operations will become even more directly applicable. We will benefit from the exchange of information from an international perspective at our Society of Actuaries annual meeting in Orlando, Florida, this October.

Disney Style cont'd

So what does running the world's largest and most successful theme park have to do with managing a division or department of a life company, or a consulting firm, or an employee benefits adviser? Lots!

Here are some comments from four management attendees of the Disney Seminar who related Disney concepts to applications in their business:

- The president of a large ice cream manufacturer is focusing on ways of communicating a very distinctive corporate culture directly to the employee. He appreciated that Disney shared its mistakes to attendees at the seminar and didn't try to say that everything was perfect in the Magic Kingdom.
- A vice president of a major hotel redefined some of his employees' jobs. Scripts were written for employees to use to deal with registrants at the hotel. Using a new computerized check-in system, the employees were able to integrate the system into the script and increase productivity and customer satisfaction.
- A regional vice president of a large bank asked his managers to forget all the rest of the goals they had, and only pay attention to one item. "Ask your people to try to meet the needs of those around them." His region won the sales award in his division. He calls it focusing on the customer.
- A senior vice president of a large hospital added more group participation during new employee orientation, exposed employees more frequently and vividly to the history of the hospital, as well as focused more on where the hospital's future lies. He saw Disney getting his employees excited about opportunities for the future.

Combining the seminar put on by Seminar Productions with the Monday afternoon workshop at the annual meeting will allow you to apply the Walt Disney World concept to improve your own part of the business world.

Seminar information and sign-up forms were provided in the registration information packet for the annual meeting.

Charles Wittenberg, a member of the Committee on Management and Personal Development, is a Consultant with Wolfman & Moscovitch Inc.

Take advantage of tomorrow's opportunities today

by Robert D. Shapiro

The annual meeting in Orlando, Florida, will feature a series of five sessions to address the questions, "What will our businesses be like in 10 years?" and "What should I do now to prepare for the changed environment?"

These sessions will offer a practical approach to dealing with tomorrow's opportunities today. Everyone is encouraged to attend these sessions and stretch their thinking as the panels discuss the needs of businesses in the year 2000.

All sessions will be held Tuesday, October 16, from 10:30 a.m. to noon. Highlights of each follow.

Future of the insurance business

You've probably already heard about internationalization, Europe 1992, and global economy, and you're either sick of it or believe that you are unaffected by it, right? We're going to try hard not to talk about that — at least as far as generalities are concerned. We do plan to assemble a panel of knowledgeable insurance executives (who, for the most part, also are actuaries), moderated by Dan McCarthy, to talk about:

- What they think their businesses will look like 10 years from now, and why.
- What kinds of skills and training actuaries will need to be useful to those businesses.
- What roles those "useful" actuaries will be able to fill.

The panelists' different points of view as individuals and the differing organizations they serve should produce a considerable variance of views.

Preparing the actuarial profession for the future

This session, moderated by Jim Murphy, will focus on three key areas: strengthening our foundation in basic education, continuing education and research, discussed by Jim Hickman; building professionalism through standards and discipline, covered by Barbara Lautzenheiser, and enhancing our public image and influence through public relations and govern-

ment affairs, discussed by Stephen Cook, a nonmember public relations professional who has been involved in the Forecast 2000 campaign.

Outlook for employee benefits

Kit Moore will moderate this session on how to prepare actuaries for the significant societal changes that will occur by the year 2000. He and his panelists will attempt to answer the following questions:

- Who will pay the growing bill for retirement and health benefits for an aging population?
- Is there any hope for the beleaguered defined-benefit pension plan?
- Are pensions and benefits in danger of being regulated to death?
- Do employees appreciate the cost and value of their pension and benefits plans?
- Will plan sponsors continue to be able to foot the bill to the same extent as in the past?

Nontraditional actuarial practice in the year 2000

The panel, moderated by Fred Kilbourne, will address and answer the question: Does the depositor/shareholder/taxpayer need a friend when the banker/manager/legislator spends his/her/its hard-earned money on harebrained schemes with future costs/risks/nasty surprises that nobody's bothered to analyze — and could/would/might the actuary be that friend?

Reinsurance in the year 2000

Reinsurance has evolved from primarily a risk management tool to one that encompasses elements of a financial management tool. Reinsurers will play an expanded role in the future. The panelists, Stephen Kraysler and Greig Woodring, moderated by Kin Gee, will address the questions: What are the implications of this future role? What will be the effects of globalization and EC 1992?

If you need more information, please refer to your annual meeting registration packet or call the Society's meeting department at 708-706-3540.

Robert D. Shapiro, Chairperson of the Task Force on the Actuary of the Future, is President of the Shapiro Network, Inc.

Annual meeting offers international opportunities



James R. Schlesinger, keynote speaker

A world of information and activities awaits those attending the Society of Actuaries annual meeting at the Buena Vista Palace in Orlando, Florida, October 14-17. The theme for this year's meeting, "International Opportunities," will be carried out in educational content, special events, exciting video enhancements... even in the food served.

The meeting's global focus offers a timely look at the changing international scene. Because the world is shrinking and becoming a "global village," it is increasingly important to understand how current issues and future events will affect the business environment for the actuarial profession, both here and abroad.

James R. Schlesinger, former Secretary of Defense and Director of the CIA, leads off the meeting as keynote speaker. Currently Senior Advisor to Shearson Lehman Hutton and on the Executive Board of the Center for Strategic International Studies at Georgetown University, Schlesinger is uniquely qualified to speak on "How the Changing International Environment Affects our Economy."

Each day's lineup has several sessions which include an international expert as a panel member in areas such as health programs abroad, global investing, European common market, the impact of AIDS worldwide, international business techniques and the evolution of the life

insurance industry throughout the world. Five "Focus 2000" sessions emphasize what the turn of the century will bring in insurance, employee benefits, reinsurance, nontraditional actuarial practice and preparing the profession for the future. With open forums, workshops and more panel discussions, the annual meeting offers something for everyone, regardless of individual interest and specialties.

Beyond educational enrichment, the relaxing Florida scenery and the meeting headquarters — the Buena Vista Palace right in the heart of Walt Disney World — add a special atmosphere, surrounding meeting goers and their families with a wide choice of recreational opportunities.

Don't delay sending in your registration form. Call the SOA Meetings Department, 708-706-3540, if you need more information.



New *Publications Index* available

by Albert E. Easton

In 1988 the Publications Policy Committee recommended, and the Board of Governors approved, the publication of an annual index of Society publications. To implement this recommendation, the Publications Index Committee was formed in 1989. The result of its efforts is the *Publications Index* — a new publication which all Society members will automatically receive. The *Index*, which will be published annually, provides a single source to locate research information published by the Society. It is organized by title, author, and subject and includes, but is not limited to, *The Transactions*, *Record*, *The Actuary*, *ARCH*, Section newsletters and *Study Notes*. This year's edition indexes all Society research material published in 1989.

Many people helped produce the *Index*. The actuaries who indexed individual publications are:

Serials

Transactions

James B. Milholland
Record

James Cochran
The Actuary

Daniel F. Case
ARCH

Charles S. Fuhrer
Study Notes

Richard Bilisoly

Section Newsletters

Actuarial Futures

G. Thomas Mitchell

Financial Reporter

Edward C. Jarrett

Health Section News

J. Martin Shipp

News Direct

Kiran Desai

Pension Section News

Diane Wasser

Product Development News

Timothy C. Pfeifer

Reinsurance Section Newsletter

Craig Baldwin

Risks and Rewards

David Hall

In addition, much valuable help on the subject listing was received from Dan Case, Ed Cowman, and Ken

McFarquhar. Thanks also are due to Tony Spano, who has made many helpful comments throughout the process, and to Barbara Simmons of the Society staff, who has done an outstanding job in the many editorial, administrative, and logistical efforts required.

In the long run, success of the *Index* will depend on user needs. In that vein, the Publications Index Committee welcomes any suggestions or comments users may have about the *Index*, its organization, subject categories, and so forth.

Albert E. Easton, Chairperson of the Publications Index Committee, is a Consulting Actuary with Milliman & Robertson Inc.

AFIR cont'd

practice, distinguishing among banks/depository institutions, pension funds, insurance companies, and regulators. There also was a discussion of "hidden options" in financial products and how the risks they pose can be managed successfully.

The delegates generally felt that the colloquium was a success. Many Europeans seemed to prefer the academic content while most others appeared to enjoy the discussion of practical applications more. I believe all participants benefited from the continuity of having a single program without concurrent sessions, and that the session chairpersons did an excellent job of integrating and summarizing the various contributions.

The second AFIR colloquium is scheduled for April 17-20, 1991, in Brighton, England. Papers must be submitted by October 31, 1990, in order to be considered. I encourage readers of this newsletter to attend the colloquium and/or contribute a paper and thus help maintain a strong North American presence in AFIR. Included with this newsletter is a copy of the announcement and request for papers and a reply form.

James A. Tilley is Managing Director, Morgan Stanley & Company.

SOA-sponsored actuarial program resumes at Nankai University

by Allan Brender

The actuarial program at Nankai University in Tianjin, China, has resumed after being suspended in June 1989 following the incident at Tiananmen Square. Harry Panjer, the fourth in a series of eight instructors recruited for the program by the Society, had completed his three-week teaching stint about one week before the Tiananmen incident. I had been scheduled to follow in September 1989. The SOA Board of Governors decided early in 1990 to resume the program, and I arrived in Tianjin at the beginning of April.

Ours was not the first internationally sponsored program to resume at Nankai. Upon arriving, I met instructors from Canada, the United States, Britain, and France primarily teaching economics, finance, management, and English. Some of these individuals had been teaching in China in June 1989 and were hurriedly evacuated. A few had returned to China as early as October 1989.

My class consisted of 17 students, all studying for master's degrees in insurance. All could understand English, which was fortunate since I do not understand Mandarin! Classes for my course were held three hours per day, five days per week, for three weeks. I actually taught for more hours than I usually do in a regular one-term course at my home institution, the University of Waterloo. The students worked hard and appreciated the program. It was a pleasure to teach them.

This class is the same group that Harry Panjer taught last June. We had feared that some of them had been killed at Tiananmen Square, but we found with great relief that no Nankai students were killed.

Following the completion of the SOA-sponsored courses this July, the students will spend the next academic year preparing master's theses. We expect that they will apply the actuarial principles and methods taught in the courses to particular situations in China. Several North American

actuaries will visit Nankai to assist with the direction of these theses.

Many applications of actuarial science appear to be possible in the Peoples' Republic of China. The economy underwent a considerable decentralization about five years ago and many work units are now responsible for the financial security of their employees. Considerable interest exists in pension plans and the financing of healthcare, as many individuals are not covered by the State system. Also, the Peoples' Insurance Company is growing rapidly and individual life insurance is being sold.

China seems to be looking westward for new methods to provide for its needs. At Nankai University, several departments in the business school are devoted to the study of western practices, notably the departments of international economics and international finance. The students and faculty are extremely interested not only in actuarial theory and methods but also in practical applications and the normal operations of North American insurance companies. They would like to acquire some practical experience within our companies.

The faculty and students were good hosts and made my stay there very enjoyable. I am sure they accorded the same warm hospitality to those instructors who followed me this spring and summer — Gary Venter, Stuart Klugman, and Sam Cox.

I am grateful to have had the opportunity to participate in this program. The memories of my stay at Nankai, and of my travels through China, will remain with me always. It also is gratifying to think I have played some small part in the formation of a new actuarial profession in China. I look forward to meeting some of my Nankai students at some future international actuarial congress.

Allan Brender is Associate Professor — Department of Statistics and Actuarial Science, the University of Waterloo.

Demographics and the actuarial professional

by Anna M. Rappaport

A look at the world in which we practice today, and the world in which we practiced 10, 20 or 30 years ago, will clearly demonstrate the major changes we have encountered in demographic social patterns. Some changes during these periods were predictable, while others were unpredictable, some until virtually the day they happened. Yet actuaries evaluate risk and calculate the long-term financial implications of arrangements which pay benefits 50 and more years in the future.

The mortality table, one of our basic tools, measures the probability of death, a key demographic variable. Pension calculations typically include probabilities of death, retirement, disability and leaving employment. Analysis of experience has been a part of the basic syllabus for actuarial study for many years, and historical experience has served as the key data source.

The retirement systems, vehicles for financing healthcare, and insurance products we have designed and valued have been structured to support certain demographic and social patterns. Fundamental changes are under way in these demographic and social patterns and this article will answer several questions about these areas:

- What are the major areas of change?
- What other areas of change are related?
- What does this mean to the actuarial profession?
- What did the Committee on Planning discover about these issues?

What are the major areas of change?

The age composition of the population is changing. After 2010, the proportion of the elderly will increase dramatically. The most significant increase will be in the size of the age 85 and over group.

In addition, the labor force is becoming more middle-aged. The number of young new entrants is declining, participation rates of females are increasing dramatically, and participation rates of males, particularly after age 55, have been dropping.

The family trend now is for both spouses to participate in the labor force. Divorce rates have increased, and a large proportion of children will live with stepparents or in single-parent households for part of their childhoods.

What other areas of change are related?

Demographic change cannot be considered on an isolated basis. It needs to be considered as part of a bigger whole – the business and cultural environment. Several key trends that interact with the demographics point to a very different world. These include:

1. The globalization of business – Production decisions are often made on a global basis for manufacturing. There is some indication that some services also will move in this direction. Products are being marketed internationally while ownership of enterprises also is international.
2. Inadequate education of the American public – There is an increasing mismatch between job requirements and the people available to fill jobs.
3. Expanding technology – Technology creates opportunities to complete work more efficiently and at lower cost. The cost of technology has dropped so much that competition on the basis of superior technology no longer exists.

What does this mean to the actuarial profession?

The businesses and financial security systems that we serve have been, and will continue to be, profoundly affected by demographic and other changes within the external environment. Awareness of demographic issues and trends and anticipation of their potential impact will be important for the effective management of these businesses and for performing actuarial analyses for the employee benefits programs sponsored by those businesses. For insurance companies, these trends will be important for the design of their products, as well as their pricing and financial management. The most effective actuaries will be those who can evaluate the

interplay of the demographics with changes in consumer and employee attitudes and values, economic and social conditions and technology.

Actuaries traditionally have been experts in measuring and evaluating the consequences of demographic changes. However, current actuarial experience based on the past and existing traditional models often does not adequately reflect the changing environment and the interplay of the demographic and other forces discussed in this article. Actuaries sometimes view the past without considering the forces likely to lead to change. Sometimes, external forces signal a trend reversal, a marked change in level, or a difference in experience between various groups.

Demographic trends are very important in many specific application areas:

- Social insurance – Demographic trends tend to have a dramatic and immediate effect on social programs because they are generally pay-as-you-go, the population paying taxes at any one time is supporting the population collecting benefits. At the same time, these programs are structured to create long-term expectations and promises. Actuaries working with these programs must make long, complex projections and are probably among the actuaries with the most complete understanding of the demographic situation. However, they must make sure policymakers and the public understand what may be unpopular results of their projections.
- Individual life insurance – Life insurance pricing takes into account mortality, morbidity and lapse rates. Demographic change can mean changes in lapse rates. Projecting experience for the future is a challenge. Marketing individual life insurance is affected by age distribution and family economic structure, geographic and ethnic distribution of the population. The need for life insurance is affected by family size and sharing of economic responsibilities.
- Health insurance and benefits – Healthcare utilization is a function of age as well as other factors. The source of benefits – government, employer, or individual insurance – is a function of the structure of various financial security programs which in turn depend on demographics, family structure, ties to the

workforce, etc. Retiree health benefits are subject to many of the same influences as social insurance. Expectations are being created today in pay-as-you-go programs that will be heavily influenced by an aging population. Major concern today centers on whether those programs can continue in their present form and meet expectations. A major question today is how high healthcare costs can rise as a percentage of GNP before there is fundamental change

What did the Committee on Planning discover about these issues?

The Committee on Planning surveyed many actuaries and received input from nearly 50 people who identified issues and concerns. Harry Panjer, Bob Shapiro and I formed the subcommittee that reported to the committee on these issues. A summary of the findings states:

Effectively dealing with demographic trends is vital to the responsible performance of actuarial services for financial security systems.

The implications of demography are interwoven in everything we do. We must consider how different forces operate in order to effectively complete our work. We have been doing this for many years, but changes and complexities today make us face new challenges.

Today's environment, which has changed considerably over the last few decades and where the future age structure of the population is quite different from the past, presents particular challenges.

These issues should not be considered in isolation, but along with a fuller web of external issues.

Actuaries today include a spectrum of those who are very aware of today's demographic issues, and others who are too wedded to the study of past experience without looking at today's facts.

The article draws heavily on the subcommittee report to the Committee on Planning. The contributors to this material include the many actuaries who contributed, as well as the subcommittee.

Anna M. Rappaport, a member of the Committee on Planning, is Managing Director, William M. Mercer Inc.

Professional Actuarial Specialty Guides

by William H. Lewis, Jr.

"Mergers and Acquisitions-Life Insurance," the third in a series of specialty guides developed by the Professional Actuarial Specialty Guides (PASG) Committee, has been provided to all consulting actuaries and chief actuaries who are members of the Society of Actuaries. This guide, like the others, is intended to be used as a "road map" to guide actuaries through readings in a specialty.

Two previous specialty guides, "United States Taxation-Life Insurance" and "Canadian Taxation-Life Insurance," were sent to members of the Financial Reporting and Product Development Sections. The three titles released so far are part of the 22 specialty areas targeted by the PASG for specialty guides.

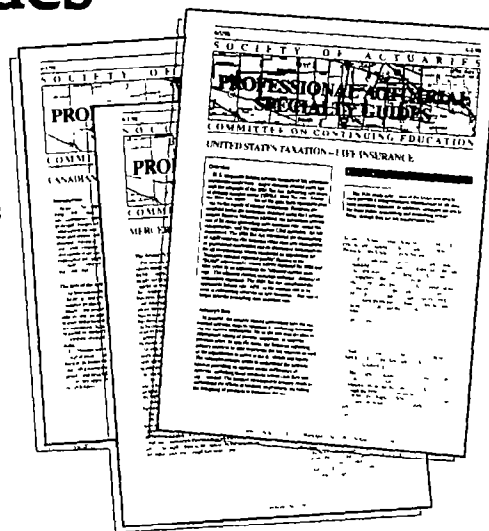
All three guides are available from Sandy Kossack of the SOA office. Single copies are free to members and multiples are available at reasonable cost. Call or write Kossack for more information at the Society of Actuaries, 475 North Martingale, Suite 800, Schaumburg, IL 60173-2226, 708-706-3545.

The SOA Board of Governors has concluded that the Society is in the business of providing continuing education but the Society does not yet formally require it. Continuing education has been the subject of much discussion and debate, and more is to come. These specialty guides can provide the genesis of self-study programs which could be used to satisfy basic requirements for continuing education.

Future guides include: "Mergers & Acquisitions-Employee Benefits," "Health-Individual," "Product Development-Life," "Product Development-Annuity," "Financial Reporting-Canada," "Employee Benefits-U.S.," and others. Guides will be updated as often as practical to keep references current.

How to use specialty guides

Actuaries who choose to remain at the forefront of their profession can use the guides as a tool to either maintain or enhance existing skills. Alternatively, the guides are designed to enable the actuary to develop expertise in a particular specialty.



Finally, the guides provide the nucleus for a personal continuing education program.

The format of each guide provides an easy route for actuaries to learn more about a specialty. More than just a reading list, a guide begins with a short overview of the specialty, followed by a brief description of each topic and a list of major references. Each reference was carefully selected and summarized to provide an indication of the material covered, the level of difficulty and its length. Three levels of difficulty are identified: basic, intermediate and advanced.

Genesis of the guides

Three years ago, while serving on the Committee on Continuing Education, James L. Lewis, Vice President and Senior Actuary of Presbyterian Ministers' Fund, suggested the idea of specialty guides.

While the CE Committee was reviewing the Shapiro Report, Jim Lewis firmed up his early ideas. Chairperson Ernie Reynolds later authorized formation of the PASG Committee and Lewis chaired the first meeting in April 1989. There are 12 other committee members and a Society staff liaison.

Goals established early in the program, "To help experienced actuaries craft their personal continuing education plans and to provide road maps to readings on actuarial specialties for those actuaries wishing to become proficient in a new actuarial specialty," helped in

Continued on page 12 column 3

FACTUARIES

by Deborah Poppel

This is another in a series of profiles of members of the Society's Board of Governors.



Name: Arnold A. Dicke.

Birthday: January 25, 1942.

Birthplace: Hinsdale, Illinois.

Current hometown: Swarthmore, Pennsylvania and New York, New York.

Current employer: Tillinghast/Towers Perrin.

Marital status: Married (21 years this August!).

Children: Maggie, 17; Nora, 16; and Amanda, 11.

My first job was: Teaching 10th grade math at Overbrook High in Philadelphia. I lasted only one year and continue to be in awe of those who can make a career of it!

I'd give anything to meet: Woody Allen.

The number of exams I flunked: 0.

The book I recommend most often: Gailey's *History of Africa from 1800 to Present*.

The last play I saw: *Elliot Loves*, by Jules Feiffer.

Nobody would believe it if they saw me: Playing the Pirate King in *Pirates of Penzance*.

The TV show I stay home to watch: *thirtysomething*.

If I could change one thing about myself, I'd: Learn to listen better.

When I'm feeling sorry for myself, I: Change careers. Luckily, you can't feel sorry for yourself when you are in the top-ranked profession!

My fantasy is: To have a Manhattan apartment – and now I do!

The silliest thing I've ever done is: Trying to write a Ph.D. thesis on Quantum Field Theory.

If I could do it over I'd: Learn to play the blues on the piano like Otis Spann.

My proudest actuarial moment was: Being elected to the Board of Governors.

The best times of my life: Were my first year as an actuarial student and my senior year in high school – the two times when self-esteem depended only on multiple-choice exams.

Specialty Guides cont'd

developing the guides. The self-study process enables each actuary to become as proficient as the need dictates, at an appropriate pace.

A series of brainstorming sessions by the committee resulted in a list of 22 specialties to be addressed. Three specialties were selected for priority attention and a task force was established for each. The guide on "United States Taxation-Life Insurance" was headed by Louis M. Weisz, Second Vice President and Actuary of The New England. The guide, "Canadian Taxation-Life Insurance," was chaired by Michael Rosenfelder, Vice President of Confederation Life. The task force for the "Mergers and Acquisitions-Life Insurance" guide was led by Frank S. Irish, Senior Vice President and Corporate Actuary of John Hancock Mutual Life Insurance Company.

Preliminary versions of the guides were reviewed by each committee member and then by "expert reviewers" chosen from the SOA membership for their recognized expertise in the respective specialties. The final products are the result of tireless efforts of many actuaries over an extended period of time. At its January meeting, the SOA Board of Directors adopted the recommendations of the Specialty Guides Committee and adopted a formal motion that reads: "The Board expresses its appreciation to James Lee Lewis, Jr., Chairperson of the Professional Actuarial Specialty Guides Committee, for all his efforts in the continuing education area and for organizing the group that developed the Specialty Guide Program."

William H. Lewis, Jr., a member of the Professional Actuarial Specialty Guides Committee, is President of Lewis & Ellis, Inc., Consulting Actuaries.

In memoriam

Morris Monsky FSA 1930
J. E. Moore FSA 1945

GAO tax policy report

by Robert J. Johansen

(The following is a report on Taxation of Pension Income for Retired New Jersey Police and Firefighters, GAO/GGD-90-73BR, April 1990.)

At the request of Senator Bill Bradley of New Jersey, the General Accounting Office investigated whether the current (1986) IRS unisex annuity table is appropriate for determining taxable portions of pensions paid to retired police and firefighters. The New Jersey Policemen's Benevolent Association (PBA) had contended that police and firefighters have shorter life expectancies than the general population.

The GAO calculated life expectancies for police and firefighters and, based on current tax law, determined that there would be no appreciable tax savings if special tables were used. They also found that police and firefighters life expectancies were not much different from the general population.

The GAO determined that it would not be practical to provide a number of different tables for subgroups of the population. Further, the choice of a table primarily determined the timing of taxes on payments, not the total taxes paid. On the basis of its findings, the GAO supported current IRS practice. The GAO also developed male and female tables based on retirement age and percentage of contributions made after July 1986 to determine when it would be advantageous to use the 1954 table for older contributions and when the simplified general rule would be better; they suggested that IRS so inform taxpayers.

Copies of the 30-page report may be ordered from the U.S. General Accounting Office, Post Office Box 6015, Gaithersburg, MD 20877, or telephone 202-275-6241. Up to five copies are free; additional copies are \$2 each. The Society of Actuaries also has a copy for membership use.

Robert J. Johansen, Chairperson of the Committee on Government Statistics, is Consulting Actuary with Life Actuarial Services.

SOA library shelves lined with international publications

With "International Opportunities" as the theme for the annual meeting in Orlando, it's appropriate to highlight the international holdings of the Society Library. More than 18 months ago, the establishment of reciprocal exchanges of publications with actuarial and related organizations from other countries began. A list of the library holdings will be included in the Society Literature Center at the Orlando meeting.

Most of the publications are kept permanently. Photocopies of portions of journals, books, reports and/or file items may be obtained from the librarian for a minimal fee. The librarian is available to answer reference questions for members, Society staff and nonmembers, using the collection and other available information sources.

Retrieval of international information is enhanced by the library's access to computerized databases. Many databases cover international literature. Two examples are Employee Benefits Infosource (EBIS) and Informat International Business (IIB). EBIS, produced by the International Foundation of Employee Benefits Plans, covers U.S., Canadian, and international employee benefits literature. This file contains summaries of articles from more than 350 English language periodicals, newspapers, and newsletters. IIB, produced by Predictcasts, provides concise abstracts of business news articles taken from more than 400 business newspapers and journals, translated into English from 10 languages. The charge for a search is \$15. Questions about the library should be directed to Donna Richardson, SOA Research Librarian, or Mark Doherty, Director of Research.

A resource list of members who subscribe to foreign actuarial journals is being compiled. If you receive any of these journals, please send the title(s) to Richardson at the Society office. Donations of back issues of any of the listed journals would be appreciated.

The last supper

For those of you who became Fellows before the May 1990 exams, but have not yet attended a New Fellows' Dinner, you'll have a final opportunity to attend a New Fellows' Dinner at the Orlando, Florida, annual meeting. The dinner will begin at 6:30 p.m. on Tuesday, October 16.

Dinners (previously luncheons) have been a tradition for new Fellows at all of our spring and annual meetings. With the introduction of the Fellowship Admissions Course, those individuals who become new Fellows with the May 1990 and later exams will be treated to a commencement dinner following the FAC. Therefore, we will discontinue the New Fellows' Dinners at the SOA meetings after this year.

New Fellows before May 1990 are invited and encouraged to attend the "last supper." Sign up for the dinner when you register for the 1990 annual meeting.

Welcome

As you may have noticed in *The Actuary* masthead, we have made some changes in editorial responsibilities. We're pleased to announce that Tony Spano has joined us as an associate editor, and he will be responsible for the editorial content in an issue in the near future. Tony's experience as Chairperson of the Publications Policy Committee for the past three years, Secretary of the Society from 1987-89, former Editor of the *Transactions*, as well as many other related SOA responsibilities, make him a very welcome addition to *The Actuary* editorial board.

We also have a new staff editor in the Society office, Cecilia Green, who has replaced Diana Montgomery. She recently relocated to the Chicago area from Wichita, Kansas, where she was director of public relations for a Wichita advertising/PR agency. She has 10 years' experience in writing for and editing publications for a variety of firms and organizations and is accredited by the Public Relations Society of America. Please feel free to call her at 708-706-3561 with any questions, ideas or comments.

Dear Editor:

Comments on classroom versus self-study

A standard argument against a carefully monitored program of granting exam credit for academic work was offered by Walter P. Henry in the May *Actuary*. It is that "the successful college student should be able to pass the SOA exam with little additional difficulty." This statement is true, of course. A student who has learned a subject well is very likely to pass a standardized exam on that subject, even an exam as difficult as an actuarial exam.

The problem is that the converse is not true. It is possible to pass some of our examinations with no working understanding of the subject. Many of our students are taught ingenious techniques for solving exam questions as they prepare for an exam, rather than a working knowledge of the subject. I am an unfortunate example, having passed an ancient version of probability and statistics with a high grade. Henry probably passed the same version of the exam. I have never used the statistics from that book, not having learned how to or even why I should learn how to, but I learned some miraculous problem-solving tricks from my teacher. I would have been a better actuary knowing how to use statistics than knowing cute ways to solve exam problems.

If a well-educated membership is our goal, we should seek educational methods that lead to a working knowledge of the subjects which can help us do our work well. To learn to use statistics, for example, a student needs to work through some extended projects requiring the organization of data and their interpretation. Such projects will be most effective if performed under the direction of an experienced teacher. Other subjects might call for other methods.

The problem is not reliance on exams, but rather total reliance on exams. We would gain in educational effectiveness if we would use several methods of education in our E&E system, each appropriate to the subject being taught, instead of relying totally on self-study-plus-exam. We might not be quite as good at solving short exam problems, but we would be more effective at solving large problems in the real world.

Linden N. Cole

Power series

Thomas Tredway has succeeded in stimulating discussion with the mathematical fallacy he presents in the March 1990 issue of *The Actuary*. His "proof" that $2=1$ is more interesting mathematically than those "proofs" which rely on disguised forms of division by zero. Instead, the fallacy results from this fact: For a series $\sum t_n$ which is convergent to sum T , another series can be formed from the same terms. This series may be divergent, it may also be convergent with the sum not necessarily the sum of the original series. To see this work, consider Tredway's example:

$$\ln(2) = 1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} + \frac{1}{7} - \frac{1}{8} + \frac{1}{9} - \frac{1}{10} + \frac{1}{11} - \frac{1}{12} + \dots$$

$$2\ln(2) = 2 - \frac{2}{2} + \frac{2}{3} - \frac{2}{4} + \frac{2}{5} - \frac{2}{6} + \frac{2}{7} - \frac{2}{8} + \frac{2}{9} - \frac{2}{10} + \frac{2}{11} - \frac{2}{12} + \dots$$

$$2\ln(2) = 2 - 1 + \frac{2}{3} - \frac{1}{2} + \frac{2}{5} - \frac{1}{3} + \frac{2}{7} - \frac{1}{4} + \frac{2}{9} - \frac{1}{5} + \frac{2}{11} - \frac{1}{6} + \dots$$

Now combine terms in a different order — 1st+2nd, 4th, 3rd+6th, 8th, 5th+10th, 12th, ...

$$\begin{aligned} \text{Series } U &= (2-1) - \frac{1}{2} + (\frac{2}{3} - \frac{1}{3}) - \frac{1}{4} \\ &\quad + (\frac{2}{5} - \frac{1}{5}) - \frac{1}{6} + \dots \\ &= 1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} + \dots \\ &= \ln(2) \end{aligned}$$

Combining terms in this manner uses the negative terms faster than the positive terms. Note that the 2nd, 4th, 6th, 8th, 10th, and 12th terms are already included, but, of the positive terms, only the 1st, 3rd, and 5th are included. The 7th, 9th, and 11th have not yet been used.

Why be concerned, one may wonder, since all terms will be included in the new Series U ? The answer is that negative terms of the power series expansion of $2\ln(2)$, Series $V = -1 - \frac{1}{2} - \frac{1}{3} - \frac{1}{4} - \frac{1}{5} - \frac{1}{6} - \dots$ comprise a divergent series. With enough terms, the sum of Series V can be as large (in absolute value) as desired. This can be proven by showing that the partial sums s_n are not bounded.

$$\begin{aligned} s_n &= -1 - \frac{1}{2} - \frac{1}{3} - \frac{1}{4} - \frac{1}{5} - \dots - \frac{1}{n} \\ s_{2n} &= s_n - \frac{1}{n+1} - \frac{1}{n+2} - \dots - \frac{1}{2n} \\ s_{2n} &< s_n - n \times \frac{1}{2n} \\ s_{2n} &< s_n - \frac{1}{2} \end{aligned}$$

Since $s_{2n} < s_n - (\frac{1}{2})$ for all n , the sequence of partial sums s_n is not bounded and Series V does not converge.

Because the above Series V diverges, a recombination of the $2\ln(2)$ series expansion which uses negative terms quicker than positive terms, will, if it converges, converge to a

number smaller than $2\ln(2)$ — in this case, $\ln(2)$.

By the way, it is true that if a series $\sum w_n$ is absolutely convergent with sum W then any series $\sum x_n$ obtained by rearrangement of the terms of $\sum w_n$ is convergent with sum W .

Absolute convergence for a series $\sum w_n$ is satisfied when $\sum |w_n|$ is convergent.

The fallacy is assuming that this property of absolutely convergent series applies to a series which converges, but does not converge absolutely.

For more on power series, the reader is referred to *Advanced Calculus* by Angus E. Taylor and W. Robert Mann, my professor who advised me to consider becoming an actuary.

Below is a similar fallacy which may be amusing to the readers:

$$\begin{aligned} \ln(2) &= 1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} + \dots \\ &= (1 + \frac{1}{3} + \frac{1}{5} + \dots) - (\frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots) \\ &= \left\{ (1 + \frac{1}{3} + \frac{1}{5} + \dots) + (\frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots) \right\} \\ &\quad - 2(\frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots) \\ &= (1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \dots) \\ &\quad - (1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \dots) \\ &= 0 \end{aligned}$$

F. Kevin Russell

Proving once again that $1 = -1$ or $X = Y$

There have been a number of recent proofs that $2=1$ and $1=-1$. Those are, of course, specific instances of the more general situation where any number X equals any other number Y . That proof is as follows:

- (1) Z is the mean of X and Y
 $(X+Y)/2 = Z$
- (2) Multiply (1) by 2
 $X+Y = 2Z$
- (3) Multiply (2) by X
 $X^2 + XY = 2XZ$
- (4) Multiply (2) by Y
 $XY + Y^2 = 2YZ$
- (5) (2)-(3)
 $X^2 - Y^2 = 2XZ - 2YZ$
- (6) Transpose
 $X^2 - 2XZ = Y^2 - 2YZ$
- (7) Add Z^2 to both sides
 $X^2 - 2XZ + Z^2 = Y^2 - 2YZ + Z^2$
- (8) Simplify
 $(X-Z)^2 = (Y-Z)^2$
- (9) Take square roots
 $X-Z = Y-Z$
- (10) Add Z to both sides — Q.E.D.
 $X = Y$

Richard W. Erdenberger

OASDI shortfall

In the May issue of *The Actuary*, Walter J. McLaughlin poses the question that, if a recession causes the tax receipts under the Old-Age, Survivors, and Disability program to be considerably less than its outgo, could part of its contingency reserve be liquidated to meet the shortfall?

I am not at all certain what answers McLaughlin expects (or believes to be the case), but the answer is most definitely "yes." As a matter of fact, for the OASDI Trust Funds combined, such a situation occurred in every year in 1972-83. The shortfall was met by redeeming some of the invested assets (the trust funds hold government obligations with specified interest rates and maturities). This meant that the government had to borrow more from the general public than it would otherwise have done in the absence of the OASDI excesses of outgo over tax income (For a description of how such obligations are equitably issued and, when necessary, liquidated, see page 133 of my book *Social Security*, 3rd Edition, 1985.)

Robert J. Myers

Canada's supply of actuarial students

I read with interest the May 1990 article "Survey projects demand for actuaries will continue to exceed supply" by Judith Bluder

I thought that your readers might be interested in some recent statistics on the supply of students in Canada.

There are now almost exactly 2,000 undergraduate students in Canada writing actuarial exams (i.e., serious about careers as actuaries). This represents a 50-60% increase in the last three years (see accompanying breakdown as to source by campus). There are two reasons for this dramatic increase in the number of students in actuarial science in Canada. First, several new actuarial science programs have appeared including those at Calgary, University of Montreal and Concordia (also in Montreal). Second, the enrollment in the traditional programs is up substantially. For example, the 1989 graduating class at the University of Waterloo was 33, while in 1990 it was 66. Next year we have a potential graduating class of more than 100, and close to 125 in 1992.

Given that there are only 1,600 Fellows of the Canadian Institute of Actuaries and that almost 1 in 6 of

those reside outside of Canada, the employment of all of these potential actuaries will test the ingenuity of these graduates to find employment in nontraditional areas (either by practice area or geography).

Canada only

College/University	Number of Students	
	1989	1987-1989
U. of Laval	348	554
U. of Waterloo	340	471
U. of Montreal	288	439
U. of Toronto	218	359
U. of W. Ontario	173	265
Concordia	142	220
U. of Manitoba	133	196
Total	1,642	2,504
Others writing exams	306	600
Total all Canada	1,948	3,104

Robert L. Brown

Estimate too optimistic

Actuaries are supposed to be good at substituting facts for appearances and demonstrations for impressions. However, I am afraid that I am more comfortable with my impressions than I am with the Subcommittee on Actuarial Opportunities' cheerful estimate of the future demand for actuaries. Although the survey may have been carefully analyzed, it seems difficult to predict demand for actuaries from a sample that represents only 25% of the SOA membership. I suspect that the sample is likely to be biased toward firms that are larger and more stable than the average. How many companies responded that won't be here in five years? How many actuaries are going to be released by companies that collapse or are merged? If the 75% that weren't surveyed have a 3% decrease during the next five years, that will more than offset the increase from the companies that were surveyed.

Here are some of my impressions that run counter to the survey's apparent demonstrations:

- Sensible companies are going to keep their actuarial staffs lean – actuaries cost a lot of money.
- Many companies are laying off actuaries. I have worked for two companies that no longer exist. As a result, there are 20 actuaries that are working elsewhere. So far, only a few of them have had significant difficulty finding jobs, but my impression is that continued consolidation in the insurance industry will reduce the demand.

- Recruiters are telling me that, while there is still a shortage of ASAs, they don't get much business from new students anymore. This is, no doubt, the result of having 10,000 people taking Exam 100 every year. While many of them have no intention of becoming actuaries, there has been a significant upsurge in the number of people taking the exams that follow
- When we went looking for a new student this year, we were blessed with an abundance of highly qualified applicants. Our only regret was that we couldn't hire more of them. Most of them have found jobs, but they have had some difficulty getting positions in their preferred locations

Perhaps these impressions are faulty. If so, I shall go happily on my way knowing that I am secure in a changing world.

Thomas J. Hruska

Robert M. Musen (Chairperson, Subcommittee on Actuarial Opportunities) replies:

This is in response to Thomas Hruska's letter to the Editor about the survey on the demand for actuaries.

While it is true that only 25% of the Society's membership is represented by responses to the survey, it was distributed to firms, which collectively represent nearly 100% of the membership. Unfortunately, the responses were not analyzed by size of firm and to do so now would be a very time-consuming task, given the state of the data. However, Hruska has noted a valid stratification of the data which should be included in the next such survey.

In the context of Hruska's letter, I would make the following points:

- The survey was not only distributed to traditional employers of actuaries (e.g., insurance companies, insurance departments and actuarial consulting firms), but we also solicited responses from nontraditional employers such as investment banks and software houses. Thus, an attempt was made to search out all pockets of demand.
- The response rate was higher from insurance companies than it was from consulting firms. Given that the latter have been an increasing source of demand for actuaries

Continued on page 16 column 1

Dear Editor cont'd

while the former have been a relatively stable source of such demand, one might even conclude that we underestimated demand. At this point, however, we are not drawing that conclusion.

- Like most demographic variables, the demand for actuaries does vary by geography. We did some cursory analysis of the cities and regions which are more "densely populated" by actuaries. However, this analysis sheds no light on the geographical area in which Hruska is employed.
- Naturally, the other side of the equation is supply. Like most efficient markets, supply will increase where there is a perceived imbalance. Our analysis of recent trends in the number of new Fellows and Associates did not indicate large increases in those rates, despite Hruska's count of the large number of candidates writing Exam 100.

Unfortunately, there are a lot of impressions associated with this topic and perhaps not enough facts. Whenever possible, we attempted to let the data "speak for itself."

Task force should be commended

There is much to commend in the task force's "Final Report on Strengthening the Actuarial Profession," which is reproduced in the April 1990 issue of *The Bulletin*.

The task force identifies "public interface as the profession's principal area of weakness." I agree, Amen.

I am disturbed because I believe the public looks to the areas of practice in framing a picture of a profession. Dentists work on teeth, ophthalmologists on eyes, accountants on financial records and lawyers on contracts, estates, civil actions, etc. But what do actuaries work on?

People often assume that once a mortality table is constructed and premiums calculated, the actuary's job is done.

A key feature of the task force recommendations is to reconstitute the Academy to define four practice areas: life, health, casualty, and pensions. In the public mind this would seem to relegate the work of the actuary to "mortality, morbidity, and certain property coverages." If enumeration implies exclusion, this is it.

R Stephen Radcliffe in his editorial in the April 1990 *Actuary* had a better answer, namely: "Ideas are the core of our profession."

Let's subordinate the four practice areas (important though each in its own way may be) as features within the broad domain of the actuary as an evaluator of risk and contingencies. No one can "program the future," but the actuary, by reason of professional training and experience, is especially qualified to "put a cost" to departures from prediction and explain the reasons for his conclusions.

There are many areas where actuaries could use their professional training and experience to good advantage. The financial area generally, and investments in particular, give rise to many questions involving risk and contingencies. Also I would like to see more actuaries in the environmental field, in marketing, in medical studies, in public budgeting, to name a few.

If we want the public to know us, let's not box ourselves in by adopting an organizational straitjacket which seems to limit our usefulness to only the four listed fields.

Frank A. Weck

Suggestions for improving charts

Within the last few months I have read an interesting book entitled *The Visual Display of Quantitative Information* by Edward R Tufte. Tufte has searched the world for examples of graphics to illustrate his concepts and I recommend that many of his suggestions could be incorporated into the graphs and charts published in *The Actuary*. For example, on his chapter on "Data-Ink" (i.e., the relationship of the amount of data and the ink used in the chart) Tufte states five principles:

1. Above all, show the data.
2. Maximize the data-ink ratio
3. Erase nondata-ink.
4. Erase redundant data-ink
5. Revise and edit.

In his chapter on "Chartjunk," Tufte states that "the grid should usually be muted or completely suppressed so that its presence is only implicit — lest it compete with the data."

Tufte also analyzes a number of magazines, newspapers and professional society publications in terms of the data density of a graphic. This is found by dividing the number of entries in the data matrix by the

area of the data graphic. *The Wall Street Journal*, which uses a lot of graphics, had a median data density of 19. *Pravda* had 0.2, the lowest on Tufte's chart.

Now that everyone has computer programs to prepare charts and graphs, it is well worth reading a book such as Tufte's to learn what we do right and what we do wrong in terms of graphical design.

I know that I have benefited considerably from one of Tufte's main criticisms — all pie charts should be abolished.

Conrad M. Siegel

Conning the public

Walter McLaughlin's letter in the May issue of *The Actuary* on the Social Security (SS) trust fund was unintentionally incorrect. The media, helped by some conmen, distort what is happening and misstated what has happened in order to create a scary story. Half of the politicians also use words giving wrong impressions in their op-ed and magazine articles. Everyone seems to buy the con.

The present method of treating SS income in the national budget is phony, judged from any reasonable accounting standard. It was instituted by Lyndon Johnson to help sell larger deficits for his "guns and butter" Vietnam campaign. It was welcomed with open arms when former President Reagan promised that tax cuts would "balance the budget." It is still in force for President Bush who is still promising to "balance the budget" by new tax cuts. Here is how it works:

- The national budget — No budget, not even this one, is real money. The national budget is just a deliberately bad guess as to how much real money will be received and spent, by the United States in the future.
- The national debt — The national debt is based on real money. Its liabilities are largely covered by Government Bonds. They say that these bonds are "only promises" by the United States to pay in the future. So is a \$20 bill. Entrepreneur Keating is still operating at the old stand. They may be able to pick up some of his most famous high interest bonds at next to nothing. If he has burned all of them then there are other high interest private sector junk bonds all over the place. Some of them haven't even defaulted yet.

Barron's is a notorious government basher. It either did not understand the relationship between the national debt and the national budget or it had an agenda designed to con the public about that relationship. At least 90% of the public have been so conned, including some actuaries I know. Here are figures that show that con. They are taken from the publication *Monetary Trends* published in April 1990 by The St. Louis Federal Reserve Bank:

September 30, 1988 Gross Federal Debt — \$2.6170 trillion

September 30, 1989 Gross Federal Debt — \$2.8746 trillion

One Year Federal Debt Increase — \$257.6 billion

Same Period National Budget Deficit — \$186.5 billion

No more recent data has been published.

That is the con. It deals in trillions where Boesky dealt in billions. It is used to make the American people believe that the national debt is going up to a trillion dollars every five or six years when it is going up a trillion dollars every three or four years! An article by Gramm and Rudman may mention the funding of the budget deficit but never the funding of the national debt. The budget is phony because the SS contributions are being "used" (phony *Barron's*-type meaning) to reduce the nominal "budget deficit" when they are really being invested in U.S. Bonds and thus becoming a part of the national debt. The FED publication says that, on 9/30/89, \$860.8 billion was invested in U.S. bonds and held by U.S. agencies as part of the national debt. That figure includes all SS bonds and it increased from \$554.2 billion one year earlier. You can't blame Gramm or Rudman for misleading most of the people and some actuaries. Would you rather try to find \$258 billion and up in spare funds every year or \$186 billion? Or, God forbid, quit reading lips and lose your PAC money?

This is nothing new. It has been ever thus since the days of "guns and butter." Once, when the Congress tried to really use the phony budget book-keeping, and spent some of the assets outside of SS, the law made it repay the money very quickly and with interest. The newness is that the phony budget figures which were a few billion in Johnson's day are now

phony by \$71 billion in one year. That phonyness is growing rapidly from the *Barronian*-type pretense of "using" growing SS funds for "budget balancing." No one is stealing the trust funds. They are just being used twice — once to buy bonds and once to con the public about the budget deficit.

All of us should be ashamed that we permit our government to use phony accounting in which there is no honest direct relationship between an increase in the national budget deficit and an increase in the national debt. The Congress and the President know this. Several times bills have been introduced to stop the pretense that SS contributions were reducing the budget deficit. One such bill got through the House. It is hopeless to get such a bill through a Presidential veto so I doubt that the Democrats are even trying anymore. The only hope seems to be that a "man on a white horse" might appear in the 1992 election. It would have substantial campaign shock value, especially if the candidate had been voting "properly" on the prior bills. Many nonactuaries would be mad to find that they had been conned and would vote against the incumbent government. Most of about 40 million SS retirees, like other citizens, would not understand it but would vote eagerly for the candidate who said that he would stop "using" their SS funds to balance the budget. The con would suddenly work against the conmen. Would I ever hate to see that!

Charles M. Larson

Yours chauvinistically

Me thinks Ms. Lilyan Cralle doth protest too much! Furthermore, as an English gentleman and pedant with regard to the usage of the English language, I must correct her misuse of the word "myth." A myth is a primitive fable imaginatively describing natural phenomena, normally by personification! However, it is a basic fact (and therefore not a myth) that women are emotional, totally irrational and very easily placated, a fact universally accepted by those in a position to determine absolutely (i.e., men). Ms. Cralle simply defeats her argument since her letter was clearly an emotional and irrational outburst, which obviously successfully placated her.

Personally, I found the answer to the clue patently obvious and was a little disappointed with its simplicity. However, I suppose that being male, I do have the clear advantage of being rational, unemotional, etc. ...

Peter J. Froggatt

Please accept apology

To all readers who misunderstood a clue in the March Actucrostic, your Competition Editor apologizes!

Charlie Groeschell

Words cloud logic

John is the actuary in our family and I never, but never, open my mouth about mortgage-backed securities or contract options or the like. Occasionally I let slip "fellowship" or "transactions," but I'm always referring to the church or a trip to the bank. We have gotten along quite well for 40 years because I don't have a full grasp of things actuarial.

That was until the May 1990 issue of *The Actuary* arrived. On my way to the Actucrossword Puzzle, I spotted Irwin Vanderhoof's editorial "Economics of the Chinese Room." I understood exactly what he was saying because I've read a lot about Zen Buddhism and Oriental thought processes.

I was enchanted with the idea of putting all our Oriental books and artifacts in one room with a personal computer, a Japanese dictionary (I would call it the Japanese Room), a bonsai tree and two comfortable chairs. The computer would not be programmed because it would understand that everything in the room should exude Oriental AI (Artificial Intelligence). We would have a slot but a question inserted in the slot would receive no answer because Zen says that words cloud logic. I was very excited about the project.

But John said I could not change his study and that I had missed the point of the editorial. He said that only a Chinese Room can understand actuarial mathematics and economics. So I said let's not discuss it. Words cloud logic!

Beth Thompson
(Mrs. John S. Thompson, Jr.)

Panel seeks comments on confidentiality

Many federal statistics users are aware of the need for a balance between protecting the confidentiality of statistics provided by individuals and businesses, and making publicly collected data available for research and statistical uses.

In search of new ways to deal with this issue, the Committee on National Statistics and the Social Science Research Council, with support from several federal agencies, have convened a Panel on Confidentiality and Data Access. As part of its two-year study, the panel will compile relevant information from both producers and users of federal statistics.

The scope of this panel study includes publicly supported statistical data collection activities on individuals and establishments, such as censuses, surveys, administrative record data (when used for statistical purposes), and epidemiological studies. Data from clinical trials will not be considered in this study. Special issues associated with clinical trial data would require a separate study focusing on the bioethical aspects of confidentiality and data access.

Readers of this notice are invited to submit short statements on any or all of the following subjects:

Access problems — Specific examples of instances where federal agency confidentiality laws or policies have

blocked you or your colleagues' efforts to obtain data needed in your work or caused delays in arranging for access to data. Please indicate the sources and specific kinds of data desired and why the data were needed.

Suggestions for improving access — Have you had any experience in obtaining access to data not disclosed for general public use? How was this arranged? Do you have suggestions for improving data access with appropriate safeguards to maintain confidentiality and without undue risk of adverse effects on public cooperation with censuses and surveys?

Persons or businesses harmed by disclosure — Do you know of any instances in which persons or businesses were harmed by unlawful disclosure of information they provided to the government strictly for statistical purposes? How did this happen? What were the consequences? (This category differs from the first two in that statements need not be based on your personal experience.)

Please submit your statements to George T. Duncan, Chairperson, Panel on Confidentiality and Data Access, c/o Committee on National Statistics, National Research Council, 2101 Constitution Avenue, NW, Washington, DC 20418. If you have any questions, please call Virginia de Wolf, Study Director, at 202-334-2550.

Overseas employment opportunities

Periodically the International Labor Office (ILO) and the International Social Security Association (ISSA) have openings in their headquarters in Geneva, Switzerland, for actuaries and other social insurance professionals. The ILO and ISSA provide technical assistance in social security policy and programs to developing countries.

For more information about vacancies and application procedures for the ILO or ISSA and other international organizations, contact: The Director, Office of UN System Recruitment, IO/IR, Rm. 3536, Department of State, Washington, DC 20520-6319, 202-647-1046. The State Department regularly recruits Americans for professional positions in international organizations. To be considered for the recruitment roster, please send a resume.

Mail alert

The *Index to 1989 Publications of the Society of Actuaries* was mailed to members on August 15. If you have not received your *Index*, please call Donna D'Agostino at the Society office, 708-706-3526.

Correction

In the June 1990 *Actuary* article "Actuarial services for government" by Christopher D. Daykin, the National Health Insurance Act 1911 was incorrectly referred to as the National Insurance Act 1911. It also was incorrectly stated that GAD has a support staff of 66. GAD's total staff is 66. Also, it was incorrectly stated that GAD is the "industry's official actuarial adviser." GAD does not give actuarial advice directly to insurance companies, but is the official actuarial adviser to the supervisory authority — the Insurance Division of the Department of Trade and Industry. We regret these errors.

Course review seminars and actuarial classes

Georgia State University will offer examination preparation seminars between October 1 and November 2 on the following courses: 110, 151, 120, 130, 135, 140, 150, 160, 162, 165, EA2, 210.

For further information, contact Robert W. Batten, Head of Actuarial Science Program, Department of Risk Management and Insurance, Georgia State University, P.O. Box 4036, Atlanta, GA 30302-4036.

* * *

Temple University and the Actuaries Club of Philadelphia will conduct intensive review seminars from 8:30 a.m. to 4:30 p.m. for the following courses:

151 — October 12, 13
160 — October 25, 26
161 — October 20
162 — October 27
165 — October 11
210 — October 8-12
220 — October 9-13

For more information, write to Bonnie Averbach, Program in Actuarial Science, Ritter Hall Annex 475, Temple University, Philadelphia, PA 19122, or call 215-787-8153.

* * *

The University of Washington has announced autumn and winter classes to be held either on the UW campus or in downtown Seattle. Courses offered are 100, 110, 120, 130, 140 and 150. To register, call 206-543-2310. For more information, call 206-543-2320.

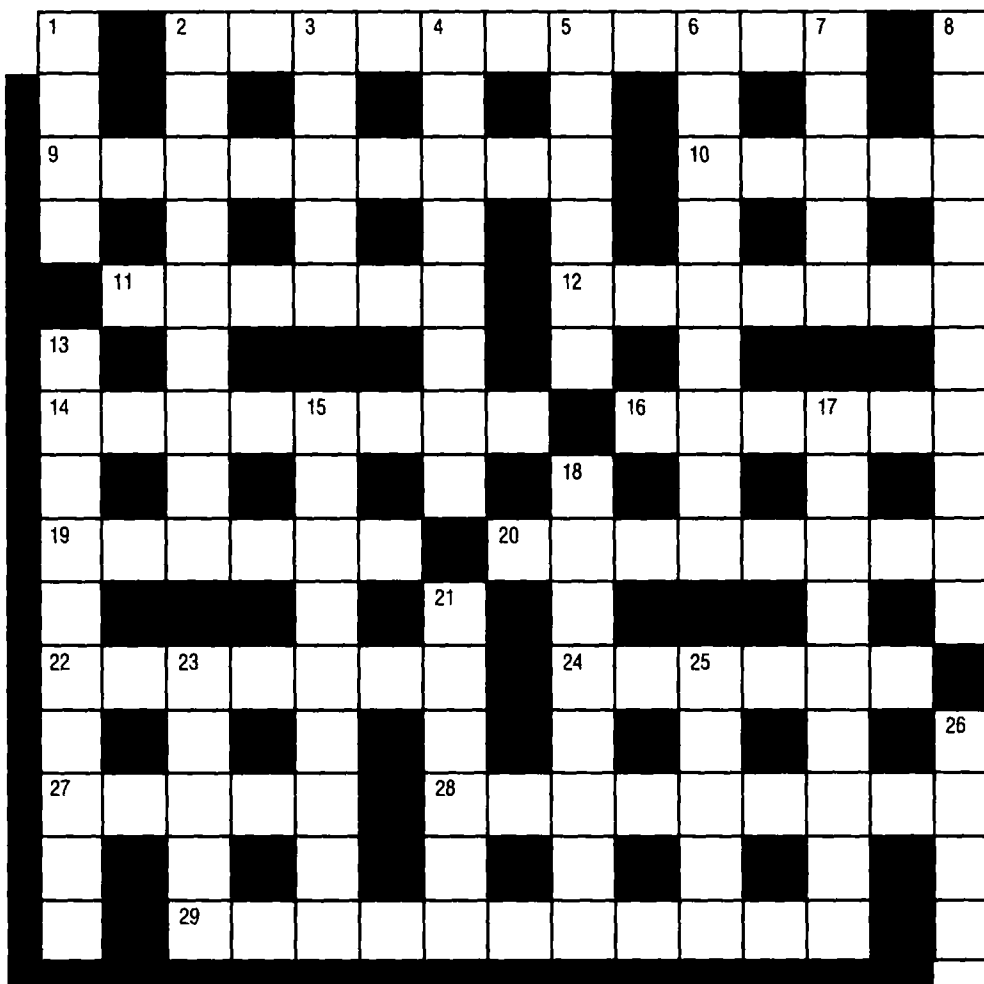
ACTUCROSSWORD

Across

Down

- 2. Non-paying net premiums? (11)
- 9. Cut out a date with Eric (9)
- 10. Animal of microbe asteroid derivation (5)
- 11. One has to be brany for such a calculation (6)
- 12. How to reduce trouble with hornets (7)
- 14. Sailing to get a star treatment (8)
- 16. Priestly circle (6)
- 19. Mollusk of alloy steroid genus (6)
- 20. Land of plenty - or loaded with trouble (2,6)
- 22. Sue has the best perm (7)
- 24. This ant makes common title for actuaries (6)
- 27. State which had a reverse in ten (5)
- 28. Ride North - in three planes (9)
- 29. Proved steep - went too far (11)

- 1. Arch exclamation? (4)
- 2. Birds of fire - old style (9)
- 3. Heather land but not morning (5)
- 4. Species of early ape from odd period (4,4)
- 5. Dishking bit of rhyme (6)
- 6. Make oil go to brim to get confusion (9)
- 7. Presidential Admission (5)
- 8. Submission of ornithological diet (6,4)
- 13. Witchcraft (10)
- 15. On that place a warning So? (9)
- 17. Form of security for U.S. readers (9)
- 18. Trifling irritant makes us run about a bit (8)
- 21. Contingencies at in reverse discard (6)
- 23. Quiet one in Pennsylvania, North (5)
- 25. "_____ " no more! Macbeth does murder—" (5)
- 26. How black things look in Kentucky (4)



June's Solution

100% SOLVERS — April: W Allison, D Baillie, K Baker, D Baldwin, J Beaton, T Boehmer, W Britton, J Brown, M & D Brown, J Carr, R Carson, G Cherlin, F Clarke, S Colpitts, J Darnton, S Dulle, B Endover, N Fischer, R Frasca, C Galloway, P Gollance, M Grover, O Gupta, C Hachemeister, P Hepokoski, R Hohertz, J Hunt, R Jenner, A P Johnson, O Karsten, R & J Koch, M Kreuter, J Larkin & W Jones, W Lumsden, P Marks,

SUFFOCATES PALM
 HIRGARRA
 O REWARDS MIGHT
 WEFERT OOH
 BEWILDER PRONTO
 OALDO
 ANTEANTIQUITY
 TEA OAS O H
 MARISSOTIVE ISLE
 M P K S C A
 ARCTIC EASTWARD
 I A R G E R N L
 MORSE ROSSINI O
 E G D A O C N N
 OLOM OFFPUTTING

P & J May, G & D Mazarts, H Migott, B Mowrey, J Paddon, R Picard R Maguire & K Ludington, J Raich, B Rickards, B Roudebush, J Schwartz, N Shapiro, J Singer, M Steinhart, H Tate, P Twomey, B & J Uzzell, M Vandesteeg & A White, C Walker, C Wasserman, D Weill, M Whitby, A Whiton, B Williams & C Tower, D S Williams, R Wilton, C Wyatt and H & F Zazret

Send solutions to: Competition Editor, 8620 N. Port Washington Rd (312), Milwaukee, WI 53217

ACTUCROSTIC

- A More than 50% _____
9 83 179 150 60 124 37 235
- B Not capable of being surrendered or transferred _____
13 218 146 89 127 27 157 229
177 102 78
- C Elicit, summon (2 wds) _____
14 111 55 97 80 143 201 225 38
- D Blood relatives (3 wds) _____
15 131 162 209 59 33 79 182 226 168
- E A word or an act expressing affection _____
10 69 215 122 42 154 227 175 85 26
- F Standard for making a critical judgement _____
53 106 163 188 155 208 88 47 66
- G "Remember the _____" from Spanish-American war _____
213 101 114 136 224
- H Station call to rail travelers (2 wds) _____
2 126 29 210 61 167 103 82 149
- I More malicious or discourteous _____
185 158 44 76 48 23 104
- J Ages of growing pains (2 wds) _____
190 70 171 194 16 133 43 112
- K Milestones _____
4 153 35 94 219 64 237 113 57
- L Tendency to bungle or make mistakes - not us, of course (2 wds) _____
109 11 206 173 28 232 99 184 132 228
- M Adam (2 wds) _____
6 222 51 145 165 123 39 174
- N In an uncertain or haphazard manner _____
32 45 129 148 68 87 22 198
- O Aloof, unsociable _____
95 117 7 34 183 134
- P Exaggerate, overemphasize (7 wds) _____
12 180 41 236 31 172 62 135 189 106
98 161 211 52 144 21 81 223 71
204 118 90 139 195 217 151 3
- Q Windshields, eg (2 wds) _____
197 19 107 86 169 220
116 152 200 100 230
- R Designate, tag, label _____
156 186 74 130 58 202 25 105
- S The only place where success comes before work _____
137 187 65 40 91 205 115 8 159 50
- T The earl obeyed the queen and punctured her (2 wds) _____
199 24 110 221 84 160 192
- U A pet control device _____
125 30 214 67 170
- V Inoculation, dose _____
166 147 63 216 181 75 196 5 121
- W Collection of unusual words or terms _____
36 233 92 73 46 164 138 176
- X Crafted personally _____
1 54 93 140 18 231 72 207
- Y Big talk, hot air (2 wds) _____
141 234 96 77 203 49 178 119 17
- Z Relieving, calming _____
56 128 120 193 142 212 20 191

1	X	2	H	3	P	4	K	5	V	6	M	7	O	8	S	9	A	10	E	11	L	12	P	13	B	14	C	15	D	16	J	17	Y	18	X	19	Q	20	Z		
21	P	22	N	23	I	24	T	25	R	26	E	27	B	28	L	29	H	30	U	31	P	32	N	33	D	34	O	35	K	36	W	37	A	38	C	39	M	40	S		
41	P	42	E	43	J	44	I	45	N	46	W	47	F	48	I	49	Y	50	S	51	M	52	P	53	F	54	X	55	C	56	Z	57	K	58	R	59	D	60	A		
61	H	62	P	63	V	64	K	65	S	66	F	67	U	68	N	69	E	70	J	71	P	72	X	73	W	74	R	75	V	76	I	77	Y	78	B	79	D	80	C		
81	P	82	H	83	A	84	T	85	E	86	Q	87	N	88	F	89	B	90	P	91	S	92	W	93	X	94	K	95	O	96	Y	97	C	98	P	99	L				
100	Q	101	G	102	B	103	H	104	I	105	R	106	F	107	Q	108	P	109	L	110	T	111	C	112	J	113	K	114	G	115	S	116	O	117	O	118	P	119	Y		
120	Z	121	V	122	E	123	M	124	A	125	U	126	H	127	B	128	Z	129	N	130	R	131	D	132	L	133	J	134	O	135	P	136	G	137	S	138	W	139	P	140	X
141	Y	142	Z	143	C	144	P	145	M	146	B	147	V	148	N	149	H	150	A	151	P	152	Q	153	K	154	E	155	F	156	R	157	B	158	I	159	S	160	T		
161	P	162	D	163	F	164	W	165	M	166	V	167	H	168	D	169	Q	170	U	171	J	172	P	173	L	174	M	175	E	176	W	177	B	178	Y	179	A	180	P		
181	V	182	D	183	O	184	L	185	I	186	R	187	S	188	F	189	P	190	J	191	Z	192	T	193	Z	194	J	195	P	196	V	197	Q	198	N	199	T	200	Q		
201	C	202	R	203	Y	204	P	205	S	206	L	207	X	208	F	209	D	210	H	211	P	212	Z	213	G	214	U	215	E	216	V	217	P	218	B						
219	K	220	Q	221	T	222	M	223	P	224	G	225	C	226	D	227	E	228	L	229	B	230	O	231	X	232	L	233	W	234	Y	235	A	236	P	237	K				

LAST MONTH'S SOLUTION (B Benn, G Stolnitz and A) Tenenbein, A Mortality Matter, "Women had to conceive early and often. As a result, women had little choice but to spend all of their time caring for the young. This pattern persisted for millions of years. Until well into the modern era, men lived longer than women. This was reversed only when childbirth risks were overcome." CONTINGENCIES, Jan/Feb 1990