The Actuarial Review

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From the President

International Issues

by Steven G. Lehmann

Recently the CAS Board approved for submission to the Fellows for a vote an Executive Council proposal to revise the constitution so that the CAS Board of Directors will be authorized to set the duties and number of vice presidents. The immediate purpose of this change is to add a new vice president to coordinate CAS international activities. I strongly endorse this change in our organization structure and the creation of a new Vice President-International. I believe that this change will allow the CAS to better serve its members in other countries and raise the visibility of the CAS in international actuarial circles.

You may be wondering if this emphasis on international is really necessary. When I took office as president-elect eighteen months ago, I had never been to another country outside the U.S. and Canada. My attitude toward international activities may have been like a lot of yours: I was somewhat skeptical of the need for spending a lot of time and energy on the international area. Since taking office, I have become convinced that it is vital to our long-term success that we take a more international view. Consider the following:

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CAS Considers Mutual Recognition Proposals

Task Force Solicits Member Input

by Mary Frances Miller

As actuaries become more and more mobile, nation-specific education systems are beginning to create barriers to practice. A Fellow in one country may not be recognized as qualified to practice in another jurisdiction. A proposal for "Mutual Recognition" of Fellowship has therefore been proposed by the Institute of Actuaries in Australia and adopted in principle by the Institute of Actuaries (U.K.). If adopted, it would mean a series of bilateral agreements among various actuarial organizations that a Fellow from one could become a Fellow in another organization after some period of residency and the local professionalism course plus possibly some local law/regulation course or exam. At least right now, only the English-speaking, exam-giving organizations are asked to participate. The proposal as applied to the CAS would apply only to actuaries with a "general insurance" specialty, not all Fellows of other organizations.

The CAS has created the Task Force on Mutual Recognition to look at the issue. We

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David P. Flynn (left) presents the 1999 Michelbacher Prize to Richard W. Gorvett. Donald F. Mango also was named recipient of the award. See story, page 11.

Spring Meeting Highlights

Hughey Encourages New Members To Take "Wing"

Orlando, Fl.—**M. Stanley Hughey**, CAS President (1974), addressed new members and attendees at the Business Session held during the CAS Spring Meeting, May 17. The session, which kicked off the first full day of Spring Meeting events, recognized new Associates and Fellows and honored award recipients. In the program following the business session, speaker Lawrence Kudlow made some predictions on the stock market, inflation, and interest rates. Kudlow is chief economist, director of research and senior vice president ofAmerican Skandia Life Assurance, as well as a business commentator and noted economist.

CAS President **Steve Lehmann** announced Jingsu Pu as recipient of the 1999 Harold W. Schloss Memorial Scholarship. Pu is a student at the University of

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Inside This Issue:

In My Opinion

Answering The Big Question

by Paul E. Lacko, *AR* Managing Editor

In this issue we are proud to publish another perceptive article from **Victoria Stachowski**, an American FCAS currently living and working in Europe. Victoria will bring you periodic news and views from "the Continent," joining **Kendra Felisky-Watson**, who does such an excellent job serving as our London bureau chief reporting on events in the U.K. International actuarial affairs are on the front burner right now, and this issue of *The Actuarial Review* will help you get up to speed.

Steve Lehmann and **Mary Frances Miller** paint the big picture for you in their articles. Kendra highlights a recent discussion between U.K. actuaries and North American actuaries, and Victoria has compiled some information about the education and training of European actuaries in countries besides the U.K. Like us, they are high-level professionals. Like us, they have to satisfy demanding requirements to earn their credibility. Unlike us, they find that actuaries can be trained effectively without requiring of them a series of ten passing grades (ten, nine, whatever) on post-collegiate examinations that concentrate on property/casualty insurance. What would it take to make European actuaries as "qualified" as North American P/C actuaries to provide actuarial services to North American clients? For that matter, what would it take to make North American P/C actuaries as "qualified" as European actuaries to provide actuarial services to clients in European countries?

"It's The Big Question knocking on our door again, this time speaking with an accent that sounds foreign to our ears."

As the CAS explores these questions and others, I can't help but think that The Big Question is knocking on our door again, this time speaking with an accent that sounds foreign to our ears: What is an actuary? Victoria chose this question as the title for her article, and it is The Big Question. No matter how hard we try to answer it, no matter how much we strain and perspire, it's never satisfied. It always comes back for more.

The Society of Actuaries is wrestling with The Big Question, again, these days. The Big Question seems to be winning. Some members of the SOA are now thinking that maybe an actuary is *anyone* who applies mathematical and statistical methods to business problems. Sounds like the old "give it everything it wants and maybe it will go away" approach to negotiation.

Sholom Feldblum, one of our favorite contributors to *The Actuarial Review*, also touches on The Big Question in his article in these pages. Indeed, if you look back at the opinion pieces we've published in *The Actuarial Review* (you do keep the old issues, don't you?) I believe you'll find The Big Question in each and every piece. As I said, it's everywhere.

Sholom's current article identifies at least three important issues that bear on The Big Question. First, the problems that traditionally have been classed as "actuarial" in nature require that the Law of Large Numbers holds. In other words, we assume that we can define a population, analyze samples drawn from the popula-

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San Francisco Hosts CAS Annual Meeting

by John F. Gibson

The 1999 CAS Annual Meeting will be held November 14-17 at the San Francisco Marriott in San Francisco. The featured speaker is Gloria Borger, one of the most experienced and respected journalists in Washington D.C. today. Ms. Borger joined *U.S. News and World Report* in 1986 as a political reporter and now serves as a contributing editor, writing the magazine's highly popular *On Politics* column. Ms. Borger is also a CBS News analyst, appearing regularly on *Face the Nation*; is a regular panelist on PBS' *Washington Week in Review;* and is a frequent guest on other nationally televised public affairs programs. She has frequently co-hosted *Equal Time* on CNBC and has appeared as a political analyst and interviewer on CNN.

Four general sessions are being planned for this meeting. In "Past President's Perspective: An Actuarial Career," a panel of past CAS presidents will conduct a lively retrospective detailing how the casualty actuary's career has changed over the years, as well as offer their perspectives on the future as the profession embarks on a new century. The panel from the second general session will explore the various ways in which actuaries can help their companies take advantage of new developments in "Technology."

The remaining two general sessions will be presented concurrently. One panel will deal with the great uncertainty of "Earthquake Exposure." The other panel, "Financial Services Reform," will discuss the threats and opportunities that will emerge as a result of recent legislation lowering the barriers between banks, securities firms and insurance companies.

Completed in 1861, the Fort Point National Historic Site is a four-tiered brick fortress built at the southern base of the Golden Gate Bridge. Rangers dressed in full Civil War uniforms lead frequent tours of the fort. (San Francisco Covention & Vistor's Bureau photo by Kerrick James.)

Some of the concurrent sessions currently planned include "ASB Complex Models," "Choice No-Fault," "Weather Hedge Products," "Protected Cell Accounting," "Path to Fellowship II," "Pacific Rim Developments," "Y2K Task Force," "Internet Exposure," "Commercial Lines Deregulation," "California Workers Compensation," "AAA Working Group on CATS," and "After Market Parts."

As usual, attendees will have the opportunity to discuss issues with the CAS Board of Directors. Attendees will also be able to participate in several sessions devoted to *Proceedings* paper presentations.

Several extracurricular activities are also available to meeting attendees and their guests. Guests can take a full-day tour to Napa Valley's wine country on Monday, and a half-day tour of San Francisco on Tuesday afternoon. On Tuesday evening, buses will take the group to "The Great Entertainer," a billiards hall complete with 40 billiards tables, shuffle board, ping-pong, foosball, darts, and video arcade games. There will be DJ/Karaoke entertainment as well as two billiards instructors.

More detailed information for the Annual Meeting, including the preliminary program and registration information, will be mailed in early September.■

Reinsurance Prize Winners Named

At the 1999 CAS Reinsurance Seminar held last June in Baltimore, the CAS awarded two CAS Reinsurance Prizes of $1,000 each to **Robert P. Butsic** and **John M. Kulik**. Butsic won for his paper "Capital Allocation for Property-Liability Insurers: A Catastrophe Reinsurance Application" and Kulik for "A Practical Application of Modern Portfolio Theory to Capital Allocation." Butsic and Kulik's papers and other reinsurance call papers are published in the 1999 CAS Spring Forum and can be found on the CAS Web Site at http://www.casact.org/pubs/forum/99spforum/99spftoc.htm.■

From the Readers

Kudos for Breaking Language Barriers

Dear Editor:

Congratulations to Victoria Stachowski on her excellent article "Breaking through the Language Barrier" in the latest issue of *The Actuarial Review*. Her comments are right on and should be mandatory reading for anyone visiting or doing a project overseas.

Charles T Bell, ACAS■

Mutual Recognition

From page 1

have noted that, in the U.S. and Canada, there are already few barriers to practice because the American Academy of Actuaries and the Canadian Institute of Actuaries set qualification standards, not the CAS or the Society of Actuaries. To practice in property/casualty areas, an actuary needs to meet the qualification standards of the CIA or AAA, which do not require CAS membership.

Why, then, should we consider mutual recognition? First, the mutual recognition proposal works in both directions. There are some barriers to practice for CAS Fellows outside North America. If we would like our own Fellows to be recognized as qualified to practice, we may need to acknowledge others' qualifications as well. Second, as free trade agreements are adopted in wider areas, we may find ourselves required to recognize the credentials of our foreign colleagues. We should consider whether we want to adopt a mutual recognition strategy or have one imposed on us. Third, it appears that the SOA is leaning toward adopting mutual recognition. The next issue of the *Actuary* will contain an article advocating mutual recognition and requesting feedback from the SOA membership. If the SOA adopts the concept, the CAS may find itself isolated from the rest of the English-speaking actuarial community.

There are reasons to be cautious in our approach, as well. CAS credentials are recognized in many parts the world besides North America. We do not want to water down the admissions requirements or cheapen the credential in any way. The Education Policy Committee (EPC) is charged with recommending waiver policies for actuaries educated in other systems. Under the current system, FIAs (general insurance) are given credit for Parts 1-5 if they decide they want to work toward CAS membership. Both the CAS and the Institute/Faculty have made major syllabus changes, however, and our current waiver policies are not up to date. The new Institute syllabus apparently has significantly more depth in property/casualty topics than the old one, so there is a possibility that the EPC will recommend that more credit be given, possibly as much as seven or eight exams. The task force has therefore decided to wait until the EPC has completed a detailed comparison of the syllabus materials and made its recommendations, sometime this fall.

"We should consider whether we want to adopt a mutual recognition strategy or have one imposed on us."

Once the EPC is done, the task force will meet to make a recommendation on the mutual recognition issue. I believe that our cautious approach is in the best interests of the membership. We don't want to appear uncooperative and possibly put our own members at a disadvantage outside North America, but we also don't want to make a recommendation that we would later regret.

In the meantime, the task force would welcome feedback from the membership. What are your experiences working outside the United States and Canada? Have you had the opportunity to work closely with general insurance actuaries from other countries? Where do you see the CAS within the international actuarial community five or ten years from now? You can respond by completing this month's survey on the CAS Web Site or by e-mail or mail to the CAS Office. Members can also contact me directly at maryfrances.miller@selectactuarial.com or Select Actuarial Services, 700 Craighead Street, Suite 303, Nashville, Tennessee 37204-2254.■

CAS Web Site News

COOS Develops New Web Section for the Academic Community

The Committee on Online Services and External Communications Committee have joined to develop a new section of the CAS Web Site for the academic community. The goal of this section is to provide a central source for CAS-supported activities relevant to those involved in teaching and researching actuarial science. The main page of this growing section can be accessed at http://www.casact.org/academ/index.htm.

The academic community section contains information about the CAS Academic Corespondent Program, and includes a program application form that can be submitted online. The section also includes the work products of the Joint CAS/CIA/SOA Task Force on Academic Relations, including the group's preliminary report and vision document of the academic partnership in 2005. Other features include scholarship information, research grant opportunities, and links Web pages of colleges and universities that offer actuarial science courses.■

Social Responsibility is Crucial To Long-Term Success of the CAS

by Alice H. Gannon

On May 5, 1999, the *Wall Street Journal* ran an article titled "Actuaries Become Red-Faced Over Recorded Pension Talk." A similar story was included on the *NBC Nightly News* the next day. I am sure that all actuaries who read or heard these stories found them distressing.

The stories quote tape recordings from the fall Society of Actuaries' meeting. The quotes were from sessions about employee benefits and the conversion many companies are making from defined benefit plans to cash balance plans. The implication of the stories is that actuaries have been part of deliberate miscommunication to employees about the impact of the conversion from one plan to the other.

I have no knowledge of whether the actuaries involved were guilty of any wrongdoing. I hope that they were not. However, I am sure that many members of the public were left with the perception that these actuaries are not performing their work with the best interests of the public in mind. I am also sure that the average member of the public makes little to no distinction between pension actuaries and actuaries who practice in other areas. The actuarial profession as a whole probably lost some credibility with the public because of these stories.

How likely is it that CAS members could be involved in a similar type of situation that might contribute to a negative impression of the profession? Is the CAS doing all that it should to help our members fulfill their obligation to the public and to promote a trustworthy public image of the casualty actuarial profession?

These are important questions for the CAS to address. Fortunately, the 1999 CAS Long Range Planning Committee (LRPC) had already identified "social responsibility" as one of the key "vitality drivers" to examine as part of this year's review of the CAS Strategic Plan.

"Is the CAS doing all that it should to help our members fulfill their obligation to the public and to promote a trustworthy public image of the casualty actuarial profession?"

On the Friday after the *Wall Street Journal* article appeared, I participated in a teleconference of an LRPC subgroup on this issue. **Lee Smith, Roberta Garland, Anne Kelly** and I met to flesh out in more detail the concept of "social responsibility" as a vitality driver of the CAS. The events of that week had made it even clearer to us that social responsibility is a critical factor in the long-term success of the CAS.

In this preliminary meeting we discussed our social responsibilities with regard to both volunteer public service and our responsibilities to the public as we perform our "paid" work. As we talked about the latter it occurred to me that we sometimes appear to fall short in this area, not because we are not fulfilling our responsibility to the public, but because we don't consistently frame our work in those terms.

Too many of us too often justify our actuarial analysis and conclusions only in terms of technical correctness or accuracy, failing to include the ultimate value-adding effect of the work. Even when we go beyond the theoretical justifications and present the practical value of the work, it is often just done in terms of value to our client or employer. We do not consistently include in discussions of our work the value brought to the ultimate end-user, the general public.

Focusing our work in terms of its public value would not change how we do the vast majority of our assignments or the conclusions we reach. Sound actuarial analysis of risk issues is of great value to society. Promoting actuarially sound solutions to risk issues is consistent with the long-term best interests of the public in almost every case. Our work is a positive force for the good of society. But by not being consistently intentional about that ultimate public outcome, we tend to not get full credit for the value we bring to the well-being of society. By our omission, others are not really given the opportunity to view us and our work as positively as we deserve.

I am looking forward to the LRPC's further discussion of social responsibility as a vitality driver for the CAS. We certainly welcome thoughts from any CAS member about what our social responsibility is and how the CAS can improve its support of its members in this area. I have always been proud to be a member of such an honorable profession and am committed to helping the CAS find the most effective ways to support the continuation of our profession's integrity as well as to promote a positive reputation for our profession with the public that we all ultimately serve.■

Exam Committee Revises Officer Titles

by Beth E. Fitzgerald
Examination Committee General Officer

The CAS Executive Council approved the Examination Committee's request to revise the titles of its officers. This change is part of the committee's reorganization for the new education and examination structure that will be implemented in 2000. The titles of chairperson and part chairperson were not revised. Effective with the Fall 1999 exams, the titles for CAS Examination Committee Officers are revised as follows:

Old Title	Revised Title
Chairperson	Chairperson
Vice Chairperson	General Officer
Assistant Vice Chairperson	General Officer
Part Chairperson	Part Chairperson
Assistant Part Chairperson	Vice Chairperson.■

In My Opinion

From page 2

tion, and then use that analysis to make valid inferences about the population.

Second, actuaries have come to realize that the Law of Large Numbers does not always lead to an acceptable solution to the problem at hand. We keep our faith in the Law of Large Numbers, but we look for other approaches to solving the problem of, for example, pricing the risk of property damage due to an earthquake. Dynamic financial analysis applies the Law of Large Numbers to help us analyze the financial impacts of various investment strategies given a set of scenarios about the future investment performance of various asset classes. The Law of Large Numbers has not, however, provided a solution to the difficult problems of accurately forecasting the movements in interest rates and stock market returns that result from very large numbers of market transactions every day.

The label "nontraditional actuarial model" is often attached to the new approaches. They are "nontraditional" because they are not based on the Law of Large Numbers. Maybe we need models that go even beyond "nontraditional," models such as the ones described in the book *Fractal Market Analysis: Applying Chaos Theory to Investment and Economics*, written by Edgar E. Peters and published in 1994 by John Wiley & Sons. (This book has an interesting discussion about the Law of Large Numbers, come to think of it.) You can check out some truly "extreme models" in *At Home in the Universe: The Search for the Laws of Self-Organization and Complexity*, written by Stuart Kauffman and published in 1995 in paperback by Oxford University Press. (Don't expect to see any continuous, closed-form functions here.)

Third, an actuary is sometimes required to act contrary to the actuary's best judgment. Such requirements are set by policy makers who understand that actuarial models do aim in the right direction and almost never produce a direct hit exactly on the bull's eye. But they are concerned that actuaries may sometimes miss not only the bull's eye, but the target, as well. In other words, how soon can we recognize a mistake, and how can we minimize and repair any collateral damage? This is not a question of *improving* our models. No model is ever likely to duplicate the workings of the real world, so there is some chance that any model, no matter how good, will fail *unpredictably* at least some of the time. What becomes of an actuary when the actuarial models fail?

It's difficult for people to trust what they don't understand, and most people don't understand actuaries. Can we blame them? What can you say when someone asks, "Well, OK, tell me, what *is* an actuary, anyway?" Can all the actuaries in the world answer that question? Not yet. But stay tuned.■

Beyond Loss Reserves—The 1999 Reserving Call Paper Program

The Committee on Reserves issued a 1999 Call of Papers on the topic of "Evaluation of Non-Loss Reserves." Thirteen papers were accepted and will be presented at the upcoming Casualty Loss Reserve Seminar. The topics covered include premium reserves for retrospectively rated policies, deductible policies, automobile warranty policies, and long-term contracts. Also included are papers on reserving for uncollectible reinsurance and medical malpractice tail coverage. A variety of expense reserves are also discussed in the papers, including unallocated loss adjustment expenses, declaratory judgment expenses, and deferred policy acquisition costs.

All of the call papers will be included in the CAS *Forum*, which will be distributed in late August. A $1,000 prize will be awarded at the Casualty Loss Reserve Seminar to the best paper submitted in response to the call. The CLRS is scheduled for September 13-14 in Scottsdale, Arizona.■

The Basics of Spatial Data Analysis

Interactive Spatial Data Analysis by Trevor C. Bailey and Anthony C. Gatrell (Addison Wesley Longman, 1995, $60.75)

Reviewed by Keith D. Holler

Spatial data analysis is essentially the study of data in which the relative location of events influences the process under review. *Interactive Spatial Data Analysis* by Bailey and Gatrell is an applied introductory guide through the topic. The text is organized around four general types of analysis.

Emphasizing the applied nature of the book, there are over two dozen individual data sets that are reviewed. A basic software package is included that allows one to step through the techniques discussed with the actual data.

The second chapter discusses the key components of computing systems. The distinction between mapping, database maintenance, and statistical analysis tools is made. Various software, including products like ARC/INFO, IDRISI, MapInfo, and SPlus, are discussed.

Chapter three begins the discussion of the first of the four general problems discussed, the analysis of point patterns. The data consist of the locations of a specific random event over a study region, R. Of interest is whether the pattern of events is random or contains a systematic pattern. Systematic patterns may be clusters, perhaps as in the location of fraudulent or staged auto accidents, or unnatural regular spacings, as in the location of cell nuclei in a tissue sample.

The null hypothesis of randomness, or complete spatial randomness (CSR) is defined as a homogeneous Poisson process. One hypothesis test discussed uses a test statistic based on quadrat counts. Quadrat counts are obtained by dropping small shapes, or quadrats, on the region R and counting the number of events contained in each quadrat. Another test is developed based on the (nearest) neighbor distances between events. The tests mentioned use approximate distributions for the test statistics. They can be considerably improved by simulating the distribution of the test statistic for the given region under the CSR assumption. The tests can also be adjusted for the influence of various covariates, like the underlying population density of the region.

Chapter five begins the discussion of the second type of problem, that of spatially continuous data. Examples of spatially continuous data include temperature, rainfall, and ore concentration. Generally, in this type of problem, one is concerned with modeling the process at points other than those included in the observed data.

Spatially continuous data exploration begins with some smoothing or interpolation techniques. Although they may have intimidating names, these techniques are actually easy to understand. The first set of techniques uses triangular regions to interpolate between the observed data points. These techniques include Dirichlet tesselation, TIN, and Voronoi polygons. The interpolations are used to construct contour maps over the entire region.

The more advanced models begin with a discussion of the variogram. The variogram can be used to estimate the covariance function between observations. The last half of chapter five and beginning of chapter six are devoted to the prediction technique called Kriging. The expected value at a new location is estimated as a linear combination of the observed values. Kriging basically gives us the weights to use, and allows one to compute confidence intervals about the predicted value. Kriging methods are actually somewhat dated. Chapter six also contains a very brief discussion of some other traditional multivariate methods like principal components and factor analysis.

Area data analysis is the third type of analysis discussed in the text. Area data is data that has been aggregated to a subregion level. Examples include voting data by state, disease incidence by town, or claim counts by zip code. With area data one is primarily interested in detecting and explaining patterns or trends.

The data visualization techniques and modeling are similar to those used in spatially continuous analysis. The exploratory techniques include simple mapping, weighted averaging, median polishing, and kernel smoothing. The more advanced models begin with generalized least squares (GLS), in which the covariance matrix is estimated via the variogram. The end of chapter seven discusses simultaneous autoregressive (SAR) and conditional autoregressive (CAR) models. Chapter eight is devoted to use of empirical Bayes analysis, generalized linear models, and image analysis, in area data analysis.

The last type of analysis is the analysis of the spatial interaction of data. The flows of items, typically people, between 'origins' and 'destinations' are modeled. An example would be modeling the flow of shoppers to area supermarkets. Given such a model, the company could then evaluate the expected impact of constructing a new supermarket in various locations. Adjustments would also be made for covariates like the attractiveness of the new facility. Other examples of this type of analysis include animal migration studies, transportation planning, and location of company-sponsored auto repair facilities.

President's Address

From page 1

1) In the last 18 months, there has been significant activity involving U.S. and Canadian companies merging with, acquiring, or being acquired by a foreign company.
2) We now have three Regional Affiliates outside the U.S. and Canada. The Taiwan Exam Center for the Society of Actuaries is now their largest exam center.
3) The globe is shrinking. More and more companies are expanding to other countries or looking to expand to other countries.
4) The actuarial profession is becoming global. Actuaries are moving to other countries to practice. Many countries are looking to develop their own general insurance actuaries.

These developments suggest the need for the CAS to take a proactive role in providing service to our members in other countries and to build respect for the CAS internationally.

We in the CAS have a level of expertise and training in property/casualty risks not found in most actuarial organizations outside the U.S. and Canada. We have a unique opportunity to expand our influence internationally and become a principal source for property/casualty research, education and expertise worldwide. A new vice president overseeing an expanded committee structure will provide a more effective way to coordinate these efforts. Although the committee structure is not set yet, we envision at least three committees:

1) A committee to coordinate our activities in the International Actuarial Association.

"We have a unique opportunity to expand our influence internationally...."

2) A committee to respond to requests for advice and assistance from countries wishing to establish a general insurance actuarial program.
3) A committee of senior actuaries to represent the CAS at international actuarial meetings.

Another idea worth considering is to establish "ambassadors" in other countries to serve as the chief CAS contact in those countries.

We are also considering more effective ways to disseminate CAS research to the international actuarial community.

Mutual Recognition

In her "From the President" column last November, **Mavis Walters** discussed the issue of mutual recognition. Mutual recognition would involve giving FCAS status to Fellows of other exam-giving bodies whose exams we have determined to be equivalent to ours and who meet certain additional requirements (for example, 12 months residence in the U.S., taking the professionalism course, and possibly a country-specific practice course). The quid pro quo would be fellowship in the other country's actuarial society for CAS members who establish practice in that foreign country. This proposal is being evaluated by the CAS Task Force on Mutual Recognition chaired by **Mary Frances Miller**.

There are difficult issues that need to be addressed by the task force in connection with mutual recognition. Are the examinations of the bodies comparable in difficulty? How do we deal with the fact that no other organization has the depth and breadth of education in property/casualty issues? And, most importantly, how do we assure ourselves that members of other actuarial organizations who establish residence in the United States are familiar enough with the legal, regulatory and accounting systems to be competent to practice?

On the other hand, mutual recognition offers a way for organizations with a rigorous education and exam process to recognize each other's members. We have much in common with actuaries from other countries around the world. If we decide against mutual recognition, how will the CAS be viewed in five years? Will we wish we had opened our doors to the global profession and likewise opened doors to our actuaries moving out into global practice? Would denial of mutual recognition be consistent with a goal of a broader, more expansive CAS? Would it be a move towards "protectionism" and away from free and open competition?

Please let Mary Frances Miller or me have the benefit of your thoughts on this important subject.■

Quarterly Review

From page 7

The text concentrates on modeling flows with gravity models. Gravity models get their name in part because the attraction between specific origins and destinations increases as the distance decreases, in the model framework.

This book is written at an introductory level. While the techniques may sound overbearing, the text makes a concerted effort to describe the underlying ideas in a common sense fashion. Armed with an understanding of these basic premises and a good software package, such as Splus, the average actuary should be able to conduct the general types of analysis described.■

1997 *PCAS* Errata Issued

CAS has issued an errata sheet for the 1997 *Proceedings*, included in the envelope of this issue of *The Actuarial Review.* The errata replaces page 29 of the paper "Homeowners Ratemaking Revisited (Use of Computer Models to Estimate Catastrophe Loss Costs)," by **Michael A. Walters** and **François Morin**. The corrected version paper is located on the CAS Web Site along with a downloadable copy of the errata at http://www.casact.org/pubs/proceed/proceed97/index.htm.■

You Shouldn't Have! When Is Accepting Gifts Acceptable?

Editor's Note: This article is part of a series written by members of the CAS Committee on Professionalism Education (COPE) and the Actuarial Board of Counseling and Discipline (ABCD). The opinions expressed by readers and authors are for discussion purposes only and should not be used to prejudge the disposition of any actual case or modify published professional standards as they may apply in real-life situations.

A particular consulting actuary, Bob, has provided consulting services to XYZ Widget Company for the past several years. Approximately three years ago, XYZ made a number of risk management and claims handling changes. At the time of these changes, despite several meetings with XYZ management, it was difficult to quantify the impact on the development pattern of losses under XYZ's self-insured program. Since it was not possible to quantify the changes, Bob decided to incorporate any changes into his projections as the loss experience began to materialize. In the year after the changes, XYZ experienced a reduction in losses. Bob gave some weight to the changes, but since XYZ's experience had historically been quite volatile, his selected assumptions were based on a longer-term average. The second year again came in favorably. Bob again adjusted his assumptions to reflect a portion of this favorable experience. After both the year one and two reports, the management of XYZ tried to convince Bob that his figures were too high and that the actual improvement was not being fully reflected.

After a third year of favorable experience, Bob decided that he had enough experience to quantify the impact of the changes and that the three years could reasonably be used to estimate reasonably the magnitude of the impact. Bob changed his assumptions to reflect fully the level of losses experienced over the past three years. While the projected ultimate losses had decreased in years one and two, the change in selected loss development patterns in year three resulted in a dramatic reduction in the projections. In addition, it should be noted that due to some personnel changes at XYZ, the data for the year three study was provided two weeks later than in prior years. To meet the company's deadline, Bob canceled his family vacation and worked around the clock for two weeks to complete the project within the time frame required by the company.

Bob shared his report with the risk management department and one week later came to XYZ to present the findings formally to the senior management team. As would be expected, the results of Bob's report were well received by the company at this presentation. After the presentation, the risk manager of XYZ handed Bob an envelope with an all expense paid trip to Hawaii for him and his family. The risk manager explained that this was a sign of XYZ's gratitude to Bob.

Should Bob accept the gift?

No. While not specifically addressing gifts, Precept 1 of the Code of Professional Conduct requires the actuary to act in a manner to uphold the reputation of the actuarial profession and Precept 2 requires the actuary to perform services with integrity, skill, and care. Bob's acceptance of this gift under the current circumstance at XYZ gives the appearance that he was influenced into reducing his figures. This appearance of impropriety hurts the standing of the actuarial profession.

Yes. Bob can accept the vacation. Not only was the vacation given to Bob after his analysis was completed, but, more importantly, Bob was unaware of the possibility of any gift in the course of his analysis. As a consequence the vacation clearly did not have an impact on the results of his analysis. In addition, this gift is a type of replacement for the vacation that Bob missed to complete XYZ's report in the shortened time frame. It is not uncommon in the business world for a company to charge more for "express" service; XYZ's gift simply rewards Bob for his extraordinary service.■

CAS Continuing Education Calendar

View the calendar online at http://www.casact.org/coneduc/cal.htm.

August 24—Seminar on Advanced Reserving Techniques and Their Application to Reinsurance Pricing,* Marriott East Side, New York City

September TBD—Online Course—Introduction to Financial Risk Management for Insurers–Module 2* (See http://www.casact.org/coneduc/oncourses.htm for more information)

September 13-14—CAS/AAA/CCA Casualty Loss Reserve Seminar, Marriott's Camelback Inn and Mountain Shadows Resort, Scottsdale

September 23-24—CAS/CIA Appointed Actuary Seminar, Montreal

October 4-5—Seminar on DFA,* Marriott Fisherman's Wharf, San Francisco

October 18-19—Seminar on Health and Managed Care, Crowne Plaza Resort, Hilton Head, South Carolina

November 14-17—CAS Annual Meeting, San Francisco Marriott, San Francisco

March 9-10—Seminar on Ratemaking, Hotel del Coronado, San Diego

*Limited Attendance

Fundraising Initiative Encourages Diversity in the Actuarial Profession

Since 1977, the mission of the CAS/SOA Joint Committee on Minority Recruiting has been to support the education of qualified minority students who have an interest in pursuing an actuarial career. The committee does this by providing scholarships and by funding summer education programs for minority students.

Funds for minority programs come largely from donations, but a new fundraising initiative has been developed by *Contingencies*, the American Academy of Actuaries' bimonthly magazine. *Contingencies* has signed an agreement with bookseller Amazon.com to allow readers to purchase books directly through the *Contingencies* Web Site, www.contingencies.org. Under the deal, *Contingencies* receives 15 percent of the price of books reviewed or recommended in the magazine and 5 percent of the price of all other books and CDs purchased. As an investment in the future of the profession, *Contingencies* will contribute 25 percent of all revenues earned to the work of the CAS/SOA Joint Committee on Minority Recruiting.

The committee is excited about the opportunity for increased revenue through this initiative. Committee chairperson Nelson Strom commented, "As proud as I am of the committee's work, the need is greater than our current resources. That is why I make a personal appeal to all actuaries to do their shopping for books and CDs through www.contingencies.org."

To participate in the initiative, go to www.contingencies.org and click on "Books." From the Books page, select a reviewed or recommended book or click on the Amazon logo at the bottom of the page. This puts you in the Amazon.com virtual bookstore, where you can browse or make a purchase right away. Every book or CD bought will provide additional money for the actuarial profession's minority programs, and participation costs no more than the price of your purchase.

In 1998, the committee awarded $29,500 in student scholarships. Of the 42 applicants, 26 received tuition grants and an exam waiver and 16 received exam waivers and/or calculators. In addition, the committee awarded funds to summer actuarial programs at Howard University and Illinois State University. This year, the committee has expanded its commitment to college-sponsored summer programs and awarded funding to programs at Howard University, Illinois State University, University of Louisville, and Temple University. These programs expose high school students with high mathematics scores to the actuarial profession through courses in math applications, computer literacy, and visits from practicing actuaries.

Individuals or companies wishing to make a direct contribution to the Joint Committee on Minority Recruiting should contact Mike Boa at the CAS office at mboa@casact.org.■

SOA Executive John O'Connor Dies

John Edward O'Connor, Jr., executive director of the Society of Actuaries and The Actuarial Foundation, died Tuesday, June 15, 1999, at Loyola University Medical Center in Chicago, from complications after surgery in April. He was 56. A funeral Mass was celebrated on June 19 in Arlington Heights, Illinois.

A Chicago native, O'Connor received his bachelor's degree in business administration from Loyola University, Chicago, and was a certified public accountant. Prior to becoming executive director of the SOA in August 1979, he was secretary-treasurer of the American College of Hospital Administrators in Chicago.

During his tenure, SOA membership nearly tripled and the organization gained respect worldwide for its many comprehensive education and research programs. Under his leadership, the Society had significant increases in committees, operating budget, and staff. O'Connor also oversaw the establishment of the first overseas SOA office in Hong Kong, The Actuarial Foundation (formerly the Society of Actuaries Foundation), and 15 SOA special interest sections.

O'Connor was also active in a number of charitable causes including Marillac Settlement House, a Catholic center for women and children on the West side of Chicago. A member of Our Lady of the Wayside Catholic Church, O'Connor was also active in fundraising for the Catholic school system in Chicago.

A career association executive, he served the Association Forum (formerly Chicago Society of Association Executives) in several capacities including as an elected member of its Board of Directors. In 1988, the CSAE honored him as "outstanding CEO" with the Samuel B. Shapiro Award, which recognizes outstanding service and accomplishment in association management.

In lieu of flowers, memorial contributions may be given to Marillac Settlement House, 212 S. Francisco, Chicago, IL 60612 or Loyola University Medical Center, Liver Transplant Unit, 2160 S. First Ave., Maywood, IL 60153.

O'Connor is survived by his wife of 33 years, Judi; their four sons John, Barry, Ryan, and Daniel, their spouses and three grandchildren; two sisters and two brothers.■

Spring Meeting
From page 1

Iowa. Lehmann also acknowledged the work of CAS volunteers, asking them to stand and be recognized.

Hughey, who became a Fellow in 1947, offered his perspective and advice as an actuary with 50 plus years' experience. Using the analogy of "roots" and "wings" Hughey encouraged new members to excel in knowledge while keeping rooted in CAS standards. "You have your roots in the CAS, but you can't stop where you are, and you must forge ahead into new horizons," said Hughey. "The CAS is shouting at you to unlimber your wings and soar into the unknown...to advance the body of knowledge of actuarial science applied to property casualty and similar business and financial risks."

M. Stanley Hughey

Hughey also marvelled at the wide range of meeting sessions available. "Speaking from a 50 year vantage point, I'm impressed with the new subjects," said Hughey. "Thirty, twenty, and even ten years ago, these subjects simply were not there."

Sporting a bright orange sport coat, Hughey closed with an explanation on his choice of apparel. "In business days in Chicago, I wore dark suits like everyone else…Today I would not wear this jacket to a business meeting in Chicago or New York or Boston or Atlanta," he said. "In case you hadn't noticed, Florida is different—far more casual and far more colorful," he said. "And so, in your business careers…you must learn to use your wings to adapt to new and different situations. Changes come, and we must lead or at least keep pace with any new solutions that are helpful in solving both old and new problems," he said.

Lawrence Kudlow

Following the business session, featured speaker Kudlow made predictions on future economic and business growth. He promised that the Dow Jones will be 50,000 by the year 2020. Kudlow also said that productivity growth due to technological change will be strong for the next 20 to 40 years and that inflation and interest rates will stay low for 20 to 30 years.■

New Associates stand and are recognized during the CAS Business Session, Monday, May 17. See pages 12 and 13 for photographs of new 1999 Fellows and Associates.

Michelbacher Prize Winners Named

Richard W. Gorvett and **Donald F. Mango** were named recipients of the 1999 Michelbacher Prize, which was presented at the CAS Spring Meeting in Orlando last May. Gorvett won for his paper "Insurance Securitization: The Development of a New Asset Class" and Mango received the prize for his paper "Risk Load and the Default Rate of Surplus." The two papers and other papers presented at the meeting are published in the 1999 Discussion Paper Program book and can be found on the CAS Web Site at http://www.casact.org/pubs/dpp/dpp99/index.htm.■

David P. Flynn (left) presents the 1999 Michelbacher Prize to Donald F. Mango.

New Fellows and Associates Honored

New Fellows first row, from left: Betsy A. Branagan, Alana C. Farrell, **CAS President Steven G. Lehmann,** Deborah M. King, Michael Shane. **Second row, from left:** Eleni Kourou, Elliot Ross Burn, Dawn M. Lawson, Claudine Helene Kazanecki, Christopher C. Swetonic. **Third row, from left:** Brian Harris Deephouse, Richard Borge Lord, Bruce Daniel Fell. **Not pictured:** Mustafa Bin Ahmad.

New Associates first row, from left: Larry Kevin Conlee, Jennifer L. Throm, Nathalie Charbonneau, **CAS President Steven G. Lehmann,** Karen N. Levine, Silvia J. Alvarez, Joseph Paul Greenwood. **Second row, from left:** Vladimir Shander, Yvonne W.Y. Cheng, Nathalie J. Auger, Andrea Elisabeth Trimble, Sally Margaret Levy, Sara Reinmann, Amy Louise Hicks, Joseph John Sacala. **Third row, from left:** Steven A. Cohen, Stephane Brisson, Jason R. Abrams, Paul Jerome Johnson, Terrie Lynn Howard, Anne M. Garside, Emily C. Gilde, Vahan A. Mahdasian. **Fourth row, from left:** Douglas M. Warner, Sean Oswald Curtis Cooper, Paul Edward Budde, Thomas LeRoy Poklen Jr., Jay T. Hieb, Jonathan Stanger Woodruff, Glenn R. Hiltpold, Kirk Francis Menanson.

New Associates first row, from left: Kelly A. Lysaght, Sharon R. Corrigan, Carolyn J. Coe, **CAS President Steven G. Lehmann,** Sheri L. Oleshko, Kathleen Frances Robinson, Jason Aaron Martin. **Second row, from left:** Timothy L. McCarthy, Ain Milner, Timothy Michael DiLellio, Gerard J. Palisi, Perry Keith Wooley, Peter J. Cooper, David Garrett Shafer. **Third row, from left:** Serge Gagné, Mark Richard Strona, Michael Douglas Nielsen, Anthony Robert Bustillo, David James Belany, John Edward Daniel, Michael W. Morro. **Fourth row, from left:** Ung Min Kim, Travis J. Lappe, Brook A. Hoffman, Kevin Earl Weathers, Bryon Robert Jones, Qing He, Kenneth D. Fikes. **New Associates admitted in May 1999 who are not pictured:** Amy Petea Angell, Anju Arora, Mario Binetti, Jean A. DeSantis, James Robert Elicker, Gregory James Engl, Janine Anne Finan, Theresa Giunta, Todd Bennett Glassman, Brendan Michael Leonard, Kevin M. Madigan, Atul Malhotra, Rasa Varanka McKean, Sarah Kathryn McNair-Grove, John-Giang L. Nguyen, William Dwayne Rader Jr., James C. Santo, Jeremy Nelson Scharnick, Trevar K. Withers.

at 1999 CAS Spring Meeting

New Associates first row, from left: Gary Steven Traicoff, Stephen James Talley, Catherine L. DePolo, **CAS President Steven G. Lehmann,** Conni Jean Brown, Sean Paul Forbes, Annmarie Schuster, Julia Feng-Ming Chu. **Second row, from left:** Burt D. Jones, Thomas S. Botsko, Jo Dee Thiel-Westbrook, Joseph Francis Rosta Jr., Brian Michael Fernandes, Frances Ginette Sarrel, Gwendolyn Anderson. **Third row, from left:** Brian K. Turner, Jeffery Wayne Scholl, Michael A. Pauletti, Daniel George Charbonneau, Jeffrey J. Clinch, Derek A. Jones. **Fourth row, from left:** Paul E. Green Jr., Anthony L. Alfieri, Todd Harrison Hoivik, Todd Douglas Cheema, James M. Gallagher, Jason Thomas Sash.

New Associates first row, from left: David C. Riek, Dengxing Lin, Sophie Duval, Prabha Pattabiraman, **CAS President Steven G. Lehmann,** Allison F. Carp, Yin Zhang, Seth Shenghit. **Second row, from left:** Derek D. Burkhalter, Michael S. Harrington, Isabelle La Palme, Bryan Hartigan, Sharon Xiaoyin Li, Anthony J. Pipia, Eric John Clymer. **Third row, from left:** Christian Lemay, Mario Richard, Patrick Beaudoin, Jose R. Couret, David W. Warren, Kristen Maria Bessette, Laura Smith McAnena, Christopher Kent Perry. **Fourth row, from left:** Sylvain Perrier, Justin Gordon Gensler, Sylvain Renaud, Robert Allan Rowe, Peter Abraham Scourtis, Jordan J. Pitz, Ronnie Samuel Fowler, Mark R. Frank.

New Associates first row, from left: Jon S. Walters, Rosemary Catherine Peck, Randall William Oja, **CAS President Steven G. Lehmann,** Janelle Pamela Rotondi, Meredith Martin Woodcock, Borwen Lee. **Second row, from left:** Mark E. Bohrer, Julie Burdick, Amy Lynn Baranek, Karen Ann Brostrom, David Ernest Corsi, Albert Maroun, Mujtaba H. Datoo. **Third row, from left:** Thomas F. Krause, Michael Bryan Adams, Jayme P. Stubitz, Leo Martin Orth Jr., David R. Border, John Michael Pergrossi, Jeffery Tim Hay, Fanny C. Paz-Prizant. **Fourth row, from left:** Christopher David Bohn, John T. Binder, Paul D. Anderson, Robert M. Thomas II, Glenn Steven Hochler, Jeffrey Alan Clements, Steven Bradley Zielke.

Actuaries Abroad

The U.K. and U.S. Compare Notes

by Kendra Felisky-Watson

On a beautiful Friday in June, the CAS and the Institute/Faculty of Actuaries held the first Joint Seminar at Staple Inn, the historic home of the Institute in the middle of London. Approximately 60 people attended the seminar to learn more about the differences and similarities between the two actuarial bodies. A sign of the growing number of CAS members in London as well as U.K. interest in the CAS is that the audience was split about equally between CAS members and Institute/Faculty members. (Please remember that there are actually two actuarial bodies in the U.K.: the Faculty of Actuaries covers Scotland and the Institute of Actuaries covers everywhere else. However, all administration is performed jointly; for example, the exams are administered together.)

The seminar was split into four sections, with a U.K. and a U.S. representative for each part. The four sections were: education and professional guidance; reserving; rating; and developments and current issues in the CAS and Institute/Faculty.

Education and Professional Guidance

Both the CAS and the Institute/Faculty have recently revised the syllabus of examinations, including concentration of country-specific information onto one exam only to recognize the growing international presence of each actuarial body. Another similarity is that both actuarial bodies teach professionalism through seminars consisting of several case studies.

Kevin Armstrong, staff actuary with the Institute, described the membership and education process in the U.K., including the new structure of the Institute/Faculty exams. Kevin also explained the continuing professional development (CPD) philosophy of the Institute/Faculty and the relevant CPD requirements. He summarized his presentation on the Institute/Faculty by concluding that there is strong support for broadening the exams, CPD is recognized as important, practising certificates may be required in more areas, and that the Institute/Faculty wants to emphasize other skills as well as passing exams.

"...Business impacts (market share, profitability, and risk selection) must be considered when deciding to write or not write the business."

Kevin Thompson, CAS Vice President-Admissions, then explained the structure of the actuarial profession in the U.S., including a description of the American Academy of Actuaries. He discussed the organizational structure of the CAS and the exam process including the new Year 2000 *Syllabus*. The CAS's continuing education policy and the opportunities provided by the CAS to meet those requirements were discussed. Kevin also went over the Statements of Principles and the AAA Professional Standards as well as the CAS's counseling and discipline procedures.

Reserving

I explained the loss reserving methods that are covered on the U.K. syllabus and compared them to the ones actually used in practice. Even though it is not really used anymore, another method, the separation method, was discussed because it was on the syllabus for many many years. (Okay, John Ryan did actually admit that he had used it once.) Craighead Curves were once used almost exclusively in the U.K. general insurance world, but are rarely used today even though they produce very pretty graphs. The exposure methods used by several London Market entities to estimate the reserves on latent claims were also discussed. U.K. reinsurance companies and Lloyd's syndicates, if they write U.S. business, are in the interesting position of actually having more reporting requirements to U.S. authorities than they do to the U.K. authorities. I went over which reserve opinions are required for which authorities and on what accounting and legal basis.

Spencer Gluck presented a very interesting discussion of various U.S. approaches to reserving. After discussing the basic triangles, he spent some time going over the use of claim count data to test things such as changes in timing of payments or case reserve strengthening. He recommended we check that the statistical evidence is consistent with anecdotal evidence, or, "do not believe everything the underwriters tell you." Spencer also went over the techniques mentioned in the Berquist-Sherman paper for adjusting for inconsistencies, as these are not really used here in the U.K. In the most interesting part of his presentation, he described what he calls the "chain ladder +" methods (Bornhuetter-Ferguson, Cape Cod and Generalized Cape Cod). Finally, Spencer discussed how he is using multiple regression models for reserving, which generated many questions from the audience.

Rating

After a nice lunch where we were able to discuss the morning's presentations as well as enjoy the lovely rose-filled courtyard, the seminar reconvened with presentations on U.S./U.K. approaches to rating. **Gary Venter**

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CAS and SOA Sponsor International Math Competition

by John P. Robertson, Liaison Representative to the Mathematical Association of America

Hundreds of the world's most talented high-school mathematics students will converge on Washington, DC, in July 2001 to participate in the 42nd Annual International Mathematical Olympiad (IMO). Each of about 90 countries will send up to six contestants for a two-day competition. Three problems are set each day, with 4½ hours allotted for the contestants to attempt solutions. CAS members can appreciate the fact that it then takes several days to grade the papers. The U.S. team has generally done very well, placing in the top 5 in 21 of the 24 years for which the U.S. has participated. Last year's team was third out of 76 countries. At the 1994 IMO every member of the U.S. team got a perfect score on every question, a feat that is unique in the history of this competition.

The sponsoring nonprofit corporation, IMO 2001 USA, Inc., has goals beyond that of staging a contest:

- Identify young Americans with mathematical talent (not just the overall winners), and begin the process of nurturing that talent.
- Promote public understanding for and appreciation of mathematics. This commitment is underscored by the theme of the 2001 IMO, "Math Expands Horizons."

For the participants, IMO 2001 USA will provide a unique opportunity to build friendships with students from other countries, to exchange mathematical ideas, and to learn about other cultures.

Hosting the visiting teams and underwriting the associated events costs money. The CAS and SOA provide support by being members of IMO 2001 USA, Inc., and participating on its board of directors.

In order to raise the $3.7 million needed to run the contest and provide funding to meet the related goals, additional sponsorship is being sought.

***John Robertson**, far right, and winners of the 1999 USA Mathematical Olympiad pose in front of the statue of Albert Einstein on the grounds of the National Institute of the Sciences. The winners from left to right are Stephen E. Haas, Reid W. Barton, Po-Shen Loh, Lawrence O. Detlor, Gabriel D. Carroll, Paul A. Valiant, and Melanie Eggers Wood. Not pictured is Sasha Schwartz.*

Corporate donors that might be willing to contribute $100,000 or more are being approached. Ideas for likely candidates are welcomed.

To get the IMO 2001 USA, Inc. started, the U.S. Department of Education awarded a grant of $100,000 for five years to provide the initial organizational base and initiate the research aspect of the program. Notification has recently been received from the National Security Agency that a $250,000 proposal and one to the National Science Foundation for $400,000 have been approved. Wolfram Research, Inc., maker of the Mathematica software, has become the first major corporate sponsor of IMO 2001 USA, Inc. with a total sponsorship of $270,000.

The U.S. team is selected through the sequence of three contests run by the American Mathematics Competitions. This organization is sponsored by 13 mathematical science organizations, including the CAS and the SOA. The first competition attracts over 350,000 students from every state in the nation. The second and third competitions are by invitation only, based mainly on results in the previous rounds. The third contest is 1999 United States of America Mathematical Olympiad (USAMO), and involves about 180 students. The six students with the best performance in the USAMO become the U.S. IMO team, and the next two become alternates.

The questions can be quite challenging, even to those who think they are mathematically inclined. Here are a few from past IMOs:

1. In a competition there are a contestants and b judges, where $b \geq 3$ is an

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Actuaries Abroad

From page 14

kicked off the afternoon session with a reminder that ratemaking is not done in an actuarial vacuum because other considerations must be addressed by the actuary. The business impacts (market share, profitability, and risk selection) must be considered when deciding to write or not write the business. Actuaries usually tend to concentrate on methodological issues such as data, credibility, and risk loads. However, we must also think about the political issues of state approval, labor, business groups, consumer advocates, as well as regulators. Finally, the actuary must be a "salesman" and balance the three conflicting areas of underwriters, management, and regulators. Gary then went on to discuss rating issues such as credibility and estimators in further detail.

The presentation on the U.K. approaches to rating was made by Karl Murphy, who started off well by mentioning that there are no statutory requirements in regard to rating in the U.K.! There are no restrictions on the prices to charge and virtually no restrictions on rating factors. U.K. insurers will update rates very frequently, sometimes daily and will use up to 20 different rating factors. This means that actuaries must prove that they can add value to the pricing process. Luckily, actuaries are becoming more and more involved in pricing in the London Market due to the influence of American-owned companies. Karl's area of expertise is in generalized linear modeling (aka GliM), which most U.K. primary companies use for rating. Karl explained the detail of how GliM models work and why people use them. It is also interesting to note that credibility is not used at all in the rating process in the U.K.

Developments and Current Issues

The final part of the day covered developments and current issues with regard to each of the actuarial bodies. Peter Wright, the chairman of the Institute/Faculty of Actuaries' General Insurance Board, discussed these areas for the U.K. For example, the Institute/Faculty recently decided on a new category of members—honorary fellows—to accommodate people who make a contribution to the actuarial profession but may not be fully qualified fellows, that is, academics. He then went on to discuss issues at Lloyd's that may potentially involve actuaries, such as whistleblowing and actuarial opinions on the reinsurance to close, in addition to the opinions required on the loss reserves alone. Peter also discussed proposals from the General Insurance Board for statutory actuarial financial condition reports that would not only encompass loss reserve opinions, but an opinion on the whole company by the actuary.

The final presenter of the day was our illustrious president, **Steve Lehmann**, who spoke about the significant increase in membership in the CAS over the last five years. He also touched on the importance of the continuing education seminars offered by the CAS. The CAS had also instituted a new category of membership, affiliate, which may be of interest to Fellows of the Institute/Faculty. He also mentioned the new Vice President-International position that is being implemented by the CAS Board. Finally, Steve discussed the Task Force on Nontraditional Areas of Practice and other major CAS initiatives as well as touched on the success of the CAS's promotion of DFA.

Unfortunately, most people could not stay to enjoy the cocktail party and sun in the courtyard because they had to rush off before the day's demonstrators (anarchists and eco-warriors) closed down the main train stations and Tube. All in all, it was a very informative day and I think people on both sides of the pond enjoyed hearing about the profession on the other side and how the other actuaries tackle similar problems. It was also nice to see all the CAS members that are working in London. I think most agreed that we must get together more often.■

Competition

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odd integer. Each judge rates each contestant as either "pass" or "fail". Suppose k is a number such that for any two judges their ratings coincide for at most k contestants. Prove $k/a^3 (b\text{-}1)/2b$.

2. Determine all integers greater than 1 such that $(2^n + 1)/n^2$ is an integer.
3. For any positive integer n, let $d(n)$ denote the number of positive divisors of n (including 1 and n). Determine all positive integers k such that $d(n^2) = k\,d(n)$ for some n.

More problems for all of the contests can be found at the American Mathematics Contests web page http://www.unl.edu/amc/problemarchive.htm. A complete set of the IMO problems, and solutions, are at http://www.kalva.demon.co.uk, along with problems from some other contests.

The winners of the 1999 USAMO held on April 27, 1999, are Reid W. Barton Arlington, MA; Gabriel D. Carroll, Oakland, CA; Lawrence O. Detlor, New York, NY; Stephen E. Haas, Sunnyvale, CA; Po-Shen Loh, Madison, WI; Alexander B. Schwartz, Bryn Mawr, PA; Paul A. Valiant, Belmont, MA; and Melanie E. Wood, Indianapolis, IN. Alexander Schwartz was the overall winner, and is the son of an FSA. Melanie Wood was on the team last year, when she was the first woman to so represent the U.S. Po-Shen Loh was in eighth grade when he took the USAMO. The winners were honored at ceremonies in Washington D.C. that included a presentation of gifts from sponsors, including the Casualty Actuarial Society. Ceremonies were held at the headquarters of the Mathematical Association of America, the National Institute of the Sciences, and the State Department.

Please send your suggestions for corporate sponsors and questions about the program to either Melvin D. George, President of IMO 2001 USA, at (573) 882-1250, Walter E. Mientka, Executive Director at (888) 449-2001, or myself at (973) 898-9393.■

Opinion

Risk-Based Capital and Ratemaking

by Sholom Feldblum

Two movements have emerged in parallel in the insurance industry: financial pricing and solvency monitoring. Long ago, pricing actuaries set rates—at least ostensibly—by assuming a five percent profit margin on premium. Arbitrary pricing formulas do not long survive in a competitive marketplace, and actuaries have since adopted return on capital, discounted cash flow, and internal rate of return models. Most of these models use assumed surplus requirements or benchmark surplus levels to calculate the needed profit margins for insurance contracts.

The second movement sprang from regulatory concerns over insurance solvency. Long ago, states set minimum surplus requirements that were tiny fractions of business volume for the largest companies. The actual surplus held was compared to arbitrary leverage ratios, such as the 2 to 1 Kenney rule that originated in fire insurance regulation. In the 1990s, the NAIC developed new risk-based capital requirements, which set surplus standards that varied by line of business and by the company's operating characteristics.

Pricing actuaries were concerned lest the regulators' opinions regarding surplus requirements affect the surplus assumptions used in their pricing models. Actuaries insisted that the risk-based capital formula not be used to determine the surplus assumptions in the financial pricing models, and regulators wrote this prohibition into the law.

In hindsight, we can only smile at this. Indeed, we scratch our heads and ask: "Just what did those actuaries mean?" So let us look first at rationale for this actuarial view, for there once was merit in the argument.

The insistence that the new risk-based capital formula not affect the surplus assumptions in the financial pricing models was tied to a second actuarial request: that the risk-based capital formula set minimum surplus requirements, not target surplus requirements.

Consider a company with a stable portfolio of private passenger automobile business or workers' compensation business. The company's actuaries examine the various risks of the insurance operations, such as underwriting risks, reserving risks, investment risks, and credit risks, and they determine that the company needs $200 million of surplus to protect its policyholders. This figure is used in the financial pricing model to produce reasonable and competitive rates.

"Does it make a difference who sets the surplus targets, whether it's the pricing actuary or the regulator?"

Suppose that the risk-based capital formula determined minimum surplus requirements of $100 million. "That's fine," said the actuaries, "this is a minimum surplus requirement. Let not the rate regulators adopt this figure and allow us a return only on the minimum $100 million instead of on our target $200 million." In this scenario, the insistence that the risk-based capital requirements not be used for pricing makes sense.

Suppose instead that the risk-based capital formula produces *target* surplus requirements. For this company, perhaps, it produces a surplus requirement of $240 million. What now should the pricing actuaries say? Should they say: "That's fine, but we need a return only on the theoretically required $200 million, not on the $240 million required by the regulators?" Of course not. The company will allocate $240 million of surplus to this portfolio of business, and the premium rates must achieve an adequate return on this $240 million of surplus.

This is the result of the risk-based capital efforts. Many companies now allocate capital by these regulatory targets or by the similar rating agency targets, not by actuarial theory alone. Capital allocation is never easy, whether by actuarial theory or by regulatory targets, since companies must consider covariances of risks and marginal surplus needs, but the overall effect is the same: Capital allocation and surplus assumptions have moved from actuarial theory to state regulation and rating agency formulas.

Some companies with greater actuarial expertise may ask their actuarial staff to see if some changes to the regulatory numbers might be warranted. But most actuarial recommendations will not get too far. If the actuary says: "We don't need $240 million, we need only $200 million," what can management reply but "We must carry $240 million to satisfy the regulators and the rating agencies; we need an adequate return on this $240 million."

"Wait," you say; "everyone agreed that the risk-based capital formula should be geared to minimum surplus requirements, not target surplus requirements. How did it come about that the formula is setting target surplus allocations for some lines of business?"

The regulators who set the risk-based capital formula may not have been adept at expected policyholder deficits or probabilities of ruin, but they were excellent tacticians. "The actuaries want minimum surplus requirements?" they said. "Then so shall it be. Our numbers are henceforth minimum surplus requirements." With great fanfare, they set target surplus

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What Is an Actuary?

by Victoria Stachowski (with Alice Underwood)

I was sitting in a gathering of American and European actuaries when the invited speaker, a European, said something like, "Of course, American actuaries aren't very good at math." At this the American part of the audience—some of them with doctoral degrees in mathematics—bristled visibly. I wondered why we had invited a speaker who would deliberately insult us.

There's a certain amount of tension between different countries' actuarial societies, with a little extra resentment aimed at the CAS. As the CAS has generally not recognized the qualifications of actuaries trained in other countries, other actuarial institutions want to return the snub. Europeans sometimes do this by asserting that the math on the CAS *Syllabus* is inadequate compared to the mathematical training required by actuarial professions in Europe. (I'm simply presenting this opinion, not necessarily agreeing with it.)

One way for the CAS to gain greater acceptance abroad would be to give more acknowledgment of other actuarial institutions. I can understand the CAS policy of not granting Fellowship or even Associateship to members of other actuarial societies—after all, other actuarial institutions have not been focused in depth on property-casualty insurance, but rather on a combination of life, nonlife, and pensions. Further, the U.S. and Canadian regulatory systems, and their attendant requirements, are different from those found in other countries. I was greatly relieved by the creation of the Affiliate status, which has provided a special membership class for those accredited in other societies.

"I wondered why we had invited a speaker who would deliberately insult us."

But in order to appreciate the training required by other actuarial institutions, we need to know what it is. Training in other countries may involve university study, on-the-job experience, a series of exams, or a combination of these. To give a brief sampling, here's a very incomplete description of a few of the European programs:

(1) Germany. Candidates must have majored in mathematics or a related field. Then they take five exams: pension, general (nonlife), life, information systems, and one of either health insurance, Bausparmathematik (mathematics for the special program of saving for real estate), or finance. The candidates also have to write a sixth, more in-depth, exam in one of these areas, which would then be their specialty.

This program is administered by the DAV (Deutsche Aktuarsvereinigung, i.e. German Actuarial Society). The exams are a little different from ours. Each lasts only 90 minutes, and they are not graded on a curve. But my colleagues assure me they are quite challenging!

(2) France. Since 1997 there has been only one professional organization, the FFA (Fédération Française des Actuaires). But as this involves the merger of four disparate societies, there are still multiple channels for becoming an actuary in France. Most of the former institutes required a university

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RBC and Ratemaking

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figures, and they called them minimum surplus requirements.

Well, it's not that simple, of course. Perhaps we give too much credit to the tactical expertise of the regulators; perhaps we are too dismissive of the random pattern of accounting data. The NAIC surplus requirements are a mixed bag, they are high in some lines and more moderate in others. Some actuaries believe that the regulators wanted more effective control over the actions of insurance companies, and the high surplus requirements satisfied this objective. Other actuaries believe that the regulators had a minimum threshold in mind, but they did not fully appreciate the effects of the risk-based capital formula.

That's the story of surplus. One might wonder, "Is this all that bad? Does it make a difference who sets the surplus targets, whether it's the pricing actuary or the regulator?"

Insurance deals with the economics of risk. Insurance companies transfer risk away from those less able to bear them, such as individual drivers and homeowners, or small businesses and medium-sized corporations. They pool risks to allow the law of large numbers to diversify the random loss fluctuations, thereby enabling risk-bearers to safely accept the exposures.

Economic operations are most efficient when risk is transferred and pooled efficiently. Economic efficiency requires that the appropriate amount of capital be used to support the insurance operations. Actuaries have begun the task of quantifying the needed capital amounts. This is a difficult task, and it will be many years until actuaries have a firm grasp on the answer. It is a worthwhile task, since an understanding of needed capital amounts will allow our economy to run more efficiently.

It is a task cut short, curtailed by regulatory fiat. The regulators have set the capital requirements. Actuaries are no longer needed. They may now go back and ponder their loss reserve triangles.■

degree in actuarial science, special university-level actuarial courses, and often some practical work. Now that there is a unified society, the FFA is working to harmonize their approaches.

(3) Italy. Italian actuaries also receive their training through university. Until recently there were only two universities that supplied this training, but that is changing. The studies usually take 5 years to complete, because the students need to pass a total of 25 exams, many with both written and oral components. Finally, there is a "Tesi," a discussion of all the coursework with the professors, and a single examination given by the state, "Esame di Stato."

(4) Sweden. There is no specific examination system. However, "actuarial competence" is important and is defined as a combination of mathematics and mathematical statistics in the academic education. Job training is not specifically required but in order to be accepted into the Swedish Actuarial Society you must be approved by a committee; most candidates have actuarial experience.

(5) Netherlands. In the Netherlands you have to be a member of the "Actuarieel Genootschap," or Actuarial Society. There are two ways to become a member. One is to complete a Master's degree in actuarial science at the university first (4 years) and then pass a couple of additional courses such as ethics, speaking and writing skills, and negotiation techniques.

The other longer way is to take courses through the "Actuarieel Instituut." The first step is the "Actuarieel Rekenaar" diploma, based on nine courses (1.5 years). The second is the "Actuarieel Analist" diploma, based on another 21 courses (3.5 years). The level of "Actuarieel Analist" is comparable to a Bachelor's degree. After this, 15 additional modules are required to reach the same level as people who attained accreditation via the Master's degree. Those modules are partly given at the university.

Both routes to certification require at least two years of actuarial work experience in a broad range of topics and a written thesis of about 60 pages. During the educational process, the candidate chooses a specialty from among four possibilities: life, nonlife, pensions and social insurance, and Actuarial Approach for Financial Risks (AFIR).

All of these methods have their pluses and minuses, as does the CAS system. And although the CAS may not give actuaries trained in these and other programs reciprocal Fellowship status, it's important—especially if you work abroad—to show respect for the work your foreign colleagues have done to attain their designations. And a better understanding of what kind of education your non-CAS colleagues have gone through helps you better argue in support of the value of the FCAS designation.■

Nonlife Actuaries Around the World

Chart by Mark W. Scully

Country	#of Nonlife Actuaries	Certification Requirements	Degree of Actuarial Involvement
U.K.	> 300	10 Exams + 3 years' work experience	High; actuarial opinion required on Lloyd's solvency reserves
Australia	80-100	10 Exams	High (but no statutory role)
Japan	250	8 Exams	Low
France	200	University courses (3 years' actuarial science)	Moderate
Italy	70	University degree in actuarial science + 1 exam	Moderate
Germany	350	University degree in mathematics + 6 exams + 3 years' work experience	Moderate; statutory role of responsible actuary
Brazil	1,000 (total, life & P/C)	University degree in actuarial science	Low but growing; new statutory requirement to hold IBNR reserves
Netherlands	90 (10 in true P/C lines)	Masters degree in actuarial science + 2 years' part-time study, OR 8.5 years' part-time study, PLUS work experience with mentor, written reports, and oral exam	Low in P/C lines, high for disability (reserves must be authorized) and medical insurance
U.S.	2,900	10 Exams	High

Update on the Joint Task Force on Academic Relations

by Dale Porfilio, CAS member of the Joint Task Force on Academic Relations

A joint task force to explore a closer partnership between the academic and actuarial communities began its work in July 1998 with representatives from the Casualty Actuarial Society (CAS), Canadian Institute of Actuaries (CIA) and the Society of Actuaries (SOA). The Task Force on Academic Relations' efforts have produced the following accomplishments.

Preliminary Report

"The Actuarial Profession and the Academic Community: The Case for a Partnership" was issued in December 1998 and is available on the CAS Web Site at www.casact.org/academ/prerpt.htm. This report outlined the need for such a partnership, set some preliminary objectives and raised questions to be considered. The governing bodies of the three organizations reviewed the report and provided feedback for the task force to consider:

Updated objectives

The task force now identifies eight primary objectives for the partnership, including:

- To produce a sufficient number of highly qualified students and employees;
- To produce a sufficient amount of theoretically sound and practical research;
- To optimize the use of the combined resources of the academic community and the actuarial profession;
- To maintain a flexible and dynamic basic and continuing education system.

Communication Plan

In March, the three governing bodies encouraged implementation of a communication plan that included these key goals:

- To publish articles on the task force and outline trends in the actuarial profession;
- To make presentations and gain feedback at 1999 meetings of academia and the actuarial profession, such as the Actuarial Research Council (ARC) in August in Des Moines, Iowa, and the CAS Annual Meeting in San Francisco in November;
- To create an e-mail list to provide two-way communication between interested parties. To join the "Academic Relations" e-mail list, go to www.soa.org, then *"List Serves, Public;"*
- To create a white paper that will be released for member comment early in 2000 outlining ways to implement the "Vision of Academic Partnership 2005."

Reorganized Listing of Schools

The task force set as one of its first priorities to recommend a new structure to reorganize and expand the listing of colleges and universities into more meaningful categories. A discussion document was well received by leadership at March meetings at which the task force suggested a structure and criteria to create four categories:

- Introductory Undergraduate
- Advanced Undergraduate
- Graduate – Education
- Graduate – Education and Research

The expanded listing should be available for the year 2000.

Vision of Academic Partnership 2005

The task force has developed a vision document of the academic partnership in 2005. Driving the task force's work is the strong conviction that a partnership between the actuarial profession and the academic community is essential to the continued success of the profession. The strong, vibrant university system can contribute to the education and research vital to helping actuaries practice in the emerging global business world.

The latest draft of the vision is available at www.casact.org/academ/vision2005.htm. The task force welcomes your comments using the form on the CAS Web Site or by contacting me directly at dpor2@allstate.com.■

Correction

A side bar of the Victoria Stachowski's article, "Breaking Through the Language Barrier," contains an error (May 1999 *AR*). The correct spelling of the French words for earned premium and written premium are *prime émise* and *prime acquise*, respectively. In the same issue, the byline for Kendra Felisky-Watson was inadvertently left off of the article "Congratulations! It's a Euro!" The *AR* regrets the errors.■

2000 IACA Meeting Slated for Hershey, PA

The next biennial meeting of the International Association of Consulting Actuaries (IACA) will take place June 4-8, 2000, at the Hotel Hershey in Hershey, Pennsylvania. The professional program will be invaluable to insurance and benefit consultants and forensic actuaries. With the globalization of business, even small-firm actuaries must increasingly become aware of the developing international accounting rules affecting pension and insurance matters.

IACA membership dues have been reduced from U.S. $55 to U.S. $25 per year. In order to join, actuaries from the U.S. must have three years' consulting experience as well as Fellowship in the CAS, SOA, the British Institute or Scottish Faculty, or the Conference of Consulting Actuaries. For an application, write to: Dudley Funnell, IACA Secretary-Treasurer, 1421 Strada D'Argento, Venice, Florida 34292; phone 941/485-1922; fax 941/486-1191; e-mail funnell@home.com.■

Academy Honors Bailey for Public Service

Pictured left to right are Academy President Richard S. Robertson, Robert A. Bailey, and Robert J. Myers.

Robert A. Bailey, former first deputy insurance commissioner for the state of Michigan, is the 1999 recipient of the Robert J. Myers Public Service Award of the American Academy of Actuaries. Bailey, who accepted the honor at the May 27 Academy Washington Luncheon, is the first actuary in casualty practice to receive the award.

In presenting the award, Academy President Richard S. Robertson cited the words of casualty actuary Michael Lamb, one of those who nominated Bailey. "'Much of Bob's career was spent with the state of Michigan and the National Association of Insurance Commissioners (NAIC) service office, where his intelligence and self-discipline enabled him to make many formative contributions to the regulatory database, solvency tests, and profitability concepts that we embrace today. Probably no other single individual has contributed so much to our ability to intelligently regulate casualty insurers for the public interest.'"

As chief casualty actuary of the Michigan Insurance Bureau from 1965 until 1974, and as first deputy commissioner from 1991 until 1997, Bailey developed one of the first computerized audits of property/casualty financial statements. He was instrumental in the development of the NAIC Early Warning System, now called the Insurance Regulatory Information System. As director of the NAIC Database from January 1974 until February 1981, he helped bring casualty insurance regulation into the computer age.

Bailey is a 1951 graduate of the University of Iowa, where he earned an M.S. in actuarial science in 1953. He is a Fellow of the CAS and has served on both the CAS and Academy boards of directors. In addition to his governmental service, Bailey's actuarial career has included employment by private firms, including the A.M. Best Company and E.W. Blanch Company.

Bailey is a second-generation actuary; his father was Arthur Bailey, a former New York state insurance regulator. The contributions that both Baileys made to the development of credibility theory are described in a feature article in the April *North American Actuarial Journal*, published by the Society of Actuaries.

The Robert J. Myers Public Service Award, presented annually to an actuary who has made a noteworthy contribution to the public good, is named for the former chief actuary of the Social Security Administration. Previous years' recipients are former California regulator John Montgomery (1995); Guy King, former chief actuary of the Health Care Financing Administration (1996); James Gardiner of the New York State Department of Insurance (1997); and Dwight K. Bartlett III, former Social Security chief actuary and Maryland insurance commissioner (1998).■

Anderson Memorial Nominations Sought

The Actuarial Education and Research Fund (AERF) is seeking nominations for the James C.H. Anderson Memorial Award for outstanding contributions to the actuarial profession during the last fifty years. The award consists of a one-time $10,000 scholarship, in the name of the winner, to the winner's alma mater. The institution will select the recipient of the scholarship, subject to guidelines on the nature and scope of studies to be funded. Individuals from any country are eligible, and need not be living. Nominations are due September 1, 1999.

A selection committee, with appropriate international representation, will be established by the AERF to determine the winner. The award will be presented during the October 17-20, 1999 Society of Actuaries Fiftieth Anniversary Meeting in San Francisco.

Nomination forms are available from Paulette Haberstroh, AERF, c/o Society of Actuaries, 475 N. Martingale Road, Suite 800, Schaumburg, IL 60173-2226; phone (847) 706-3584; fax (847) 706-3599; e-mail phaberstroh@soa.org.

James Charles Henry Anderson made many lasting contributions to his profession, community, family, and friends. His vision, leadership and communication skills have had a profound influence on international insurance and financial communities. In 1995, Anderson's friends and colleagues established the memorial to reward excellence in his name and to pay tribute to a man whose vision and innovations inspired many of today's industry leaders.

AERF, sponsored by the CAS and six other North American actuarial organizations and an affiliate of the Actuarial Foundation, administers the Anderson Memorial.■

CORP To Post Accepted Papers on Web

The CAS Committee on Review of Papers has implemented a quarterly update to the CAS Web Site featuring papers recently accepted by CORP. CORP aims to increase the accessibility of actuarial literature with the implementation of the update. Electronic versions of the accepted papers are located on the CAS Web Site at http://www.casact.org/pubs/corponweb/papers.htm and are currently being edited by the CAS Editorial Committee for inclusion in the *Proceedings of the Casualty Actuarial Society*.

The listing below includes authors who have presented papers at the 1999 CAS Spring Meeting and authors who have been invited to present their papers at the 1999 CAS Annual Meeting. The CAS appreciates the authors' contributions to actuarial literature.

As of July 14, 1999, CORP has accepted the following papers:

1. "California Workers Compensation Benefit Utilization: A Study of Changes in Frequency and Severity in Response to Changes in Statutory Workers Compensation" by Ward M. Brooks.
2. "Dirty Words: Interpreting and Using EPA Data in Actuarial Analysis of an Insurer's Superfund-Related Claim Costs" by Steven J. Finkelstein.
3. "Levels of Determinism in Workers Compensation Reinsurance Commutations" by Gary Blumsohn.*
4. "Modeling Losses with the Mixed Exponential Distribution" by Clive L. Keatinge.
5. "A Systematic Relationship Between Minimum Bias Methods and Generalized Linear Models" by Stephen J. Mildenhall.*
6. Discussion of a Discussion of "Surplus—Concepts, Measures of Return, and Determination" by David L. Ruhm and Carleton R. Grose.*
7. "The 1998 Table of Insurance" by William R. Gillam.
8. "Workers Compensation Reserve Uncertainty" by Douglas Hodes, Sholom Feldblum, and Gary Blumsohn.*

*presented in Spring 1999■

Membership Listing by Employment Type Online

This July, the CAS posted its 1999 Membership Listing by Employment Type on the CAS Web Site. This year the listing is posted in HTML format, which allows for easier access and new search capabilities.

The listing is located in the Members Only section of the Web site at http://www.casact.org/directory/99emtype/emtype.htm. Members, Subscriber Program enrollees, and Academic Correspondents who have not yet registered for a password to the Members Only section on the Web site should contact the CAS Office at webmaster@casact.org. Members, Subscribers, and Academic Correspondents without access to the Internet may obtain a paper copy of the employment listing from the CAS Office.■

25 Years Ago in *The Actuarial Review*

The following excerpts from the October 1974 issue (there were only three issues in 1974) illustrate that some actuarial topics never die.

From Paul Liscord's "From the President" column:

While the recent syllabus changes may have seemed precipitous to some, they have been in formative stages going back over five years. As a member of the Education Committee five years ago, I can recall spending hours discussing the many alternatives possible. In fact, we got back to the basic question whether or not written examinations were necessary. Our conclusion obviously was that they were necessary, and in spite of the fact that a few of our members may feel differently, we held this to be axiomatic of our profession.

…Finally, everyone should realize that the syllabus changes effective in May 1975 are only the latest update in the continuing process of keeping our exams in-tune-with-the-times. The latest tune-up by necessity is a compromise of future changes already contemplated within the Education Committee, i.e., the elimination of current Part 1. I'm confident that our current Education Committee will continue to press for further changes in order that the CAS properly meets the increasing actuarial demands of the business it serves.

From a news article:

The private passenger classification rating system is no longer serving the public and needs substantial revision.…

Phil Stern went further and questioned the rationale of the entire classification system. He expressed the opinion that the system applies hazard characteristics of a few drivers to a whole group of motorists, using the "broad brush" approach. For example, he said, "The bureau's rationale for higher rates on cars used going to and going from work was the pressure under which such use occurs. This argument completely overlooks the fact that there are many who drive to work with complete leisure; some get there too early and some do not care whether they are on time or not."

From the editorial:

Perhaps these remarks might also be directed at accountants, but the annual statement needs revision most in those areas that reflect our business as a risk operation, and here the actuaries should take the lead.■

AERF Announces Grant Award Recipients

The Actuarial Education and Research Fund (AERF) has awarded several grants in conjunction with its 1999 Individual Grants Competition.

- S. David Promislow, York University, and Virginia Young, University of Wisconsin, will use Yaari's dual theory of risk to measure the relative inequity that arises when insurers use imperfect information to estimate the net premium of insureds.
- The main objective of a study by David Ziebart, University of Illinois-Champaign, is to investigate how pension actuaries communicate actuarial information to others. The study will focus on communication links between actuaries, auditors and users of the financial statements through which actuarial information is summarized and presented.
- A research project by Daniel Dufresne, University of Melbourne, will center on recent theoretical advances in the study of integral exponential functionals in probability theory that improve the use of these functions in actuarial science and finance.
- In a project jointly funded by the AERF and Society of Actuaries Committee on Finance Research, Zinoviy Landsman, University of Haifa, plans to extend a new approach to credibility and to construct new quasi-credibility formulas.

Upon completion, the results of the projects are expected to be submitted for publication to journals such as the CAS *Forum* and *North America Actuarial Journal*.■

Brainstorms

Price Vs. Value

by Stephen W. Philbrick

"What's the value of this item?"

"Well, the price is $100."

Thus we conflate the very different concepts of price and value. One of the first economists, Adam Smith, was troubled by the disparity between price and value. Why did water, necessary for life, fetch so low a price? Why did diamonds, glittering to the eye but unnecessary to sustain life, fetch so high a price? He tried to solve the dilemma by defining two different concepts of value—value in use and value in exchange.

Subsequent developments in economics taught us the answer to the dilemma, that price is determined by the interaction of supply and demand. A high demand for water, coupled with an extremely high supply, leads to a low price. Relatively low demand for diamonds coupled with extremely low supply, leads to a high price. Value helps determine demand, but this new paradigm for price, based upon supply and demand, pushed Adam Smith's concept of value to the back seat.

At any given time, supply and demand curves cross at a single point, creating a single price for an item at that time. However, it would be misleading to assume that the value of the item to a person making a purchase at that time is equal to the price. Different people assign a very different value to an identical item, even when they are not conscious of this action. People will not enter into a transaction unless the value of the item is at least equal to the cost. When many items trade at a given price, some consumers (by definition) receive a value equal to the cost, while others receive a value in excess of the cost. The excess of value over the price is referred to as the consumers' surplus.

Producers attempt to capture this surplus through a variety of means. A classic example involves airline seats, where advance purchase restrictions allow an airline to price the otherwise identical product higher for the business traveler than for the vacation traveler, thus capturing some of the increased value of the seat to the business person.

How does this relate to insurance or actuarial science?

Many actuarial "pricing" models are two steps removed from an analysis of price versus value. First, "pricing" is often a misnomer, as many of the models attempt to measure costs, but do not formally assess prices that consumers might be willing to pay. Second, few, if any, models attempt to assess the value that customers receive from an insurance policy. Indeed, it is arguable that the principles of ratemaking do not even consider such an assessment, as the principles refer to all costs associated with a policy.

A unique feature of an insurance product is that the costs of the product are determined after the product is sold. These costs are random variables, partly dependent on future states of the economy (itself a random process) and partly dependent on random events. We can view the recent development of dynamic financial analysis (DFA) models as an attempt to evaluate the stochastic nature of the product, as well as the interactions between the future liabilities and asset returns. As such, it represents a major improvement over the use of expected values supplemented by a risk margin. Nevertheless, the current implementation of most DFA models represents (merely) an improvement to a costing model. Virtually no models (at least in the public literature) attempt to model either the marketplace of multiple insurers

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Trading Places

by John P. Robertson

The board in the diagram at right contains four white bishops and four black bishops, which move only along diagonal paths. The object of the puzzle is to maneuver the pieces so that the four white bishops trade places with the four black bishops, with no captures possible during the transfer. In other words, a white bishop and a black bishop may not occupy the same diagonal at any time. Successive moves with the same color are allowed. How do you do it?

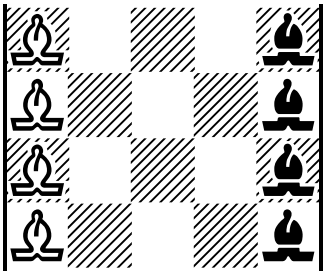
An interactive version of this puzzle can be downloaded from http://www.exeter.edu/~rparris/default.html. This is the "Peanut Software" site, hosted by Phillips-Exeter Academy. Look for the program "Winarc." Other puzzles are included within Winarc, and other puzzles and mathematical programs are available at the site (Used with permission).

Allan Bell's Double-Crostic

The solution to the previous puzzlement is: "In many states, the power to regulate rates has been transformed into the power to substitute the wisdom of a regulator for the wisdom of the marketplace. Revisions made by regulators show a clear bias in favor of rate suppression." This is from a letter to the editor titled "In Criticism of Rate Regulation" by James F. Perry, Best's Review Property/Casualty, January 1995 (Used with permission).

There was one error in the final puzzle. The word "suppression" was misspelled in the puzzle as "supression."

There was also some controversy over the spelling of "Guenevere," with some solvers suggesting this should be "Guinevere." Different sources spell this name different ways. Allan's source was the spelling on the record jacket for the Broadway cast recording of the Lerner and Loewe musical, *Camelot*. **Charlie Hewitt** checked the Library of Congress for references to each spelling, finding Guinevere 77 times and Guenevere 43 times. Charlie also notes an interesting coincidence. Julie Andrews played Guenevere on Broadway, and, according to one version of the Arthurian legend, Guenevere entered a nunnery following her affair with Sir Lancelot. Later Andrews played Maria in *The Sound of Music*. Maria leaves a nunnery to be the governess for the Von Trapp family, eventually marrying Captain Von Trapp.



Make your moves.

Solutions were sent in by Mary Ellen Carolascia, **Ann Conway, Ken Creighton**, **Todd Dashoff, John Herder, Charlie Hewitt**, Walter Hosford and **Mary Hosford** (jointly), **Paul Ivanovskis, Richard Kollmar,** Maffie Maramot, **George Morison,** Melissa Neidlinger, **Ray Niswander** and **Thomas Schadler** (jointly), **Randy S. Nordquist**, Julie Normand, and Charles Petrizzi.■

Spring Tennis and Golf Winners Announced

Attendees took to the courts and the greens to participate in sporting events on May 18 during the 1999 CAS Spring Meeting in Orlando. In tennis, **Stephanie Albrink** was the top female player and **Vahan Mahdasian** the top male. In golf, eleven foursomes and one threesome hit the links for the CAS Golf Scramble at Osprey Point Golf Course. Winners include: First gross (score 63) **Myron Dye**, **John Gibson**, **Bill Guffey**, and **Tony Kellner;** Second gross (67) **John Gradwell**, **Philip McKneely**, **Mavis Walters**, and **Michael Walters;** First net (58) **Steve Alexander**, **James Buck**, **Chuck Emma**, and **Philip D. Miller;** Second net (59) **Greg Wacker, Todd Cheema**, and **Pete Senak;** Closest to pin Steve Alexander and Sarah Karrow; and Longest drives **Kurt Johnson** and Michelle Ribaudo.■

In Memoriam

Philipp K. Stern
(ACAS 1956)
April 19, 1999

Brainstorms

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and insureds, or attempt to evaluate the value of an insurance product.

There have been some attempts to incorporate the insurance cycle into DFA models. However, these attempts generally model the cycle in an aggregate way, without attempting to consider or model the range of values that customers may assign to an insurance product. Greater analysis of the value of the insurance product may help in two respects: providing insight into how to develop products with greater value for their customers, and providing insight into how to incorporate the changing insurance marketplace into DFA models.■