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Actuaries discuss reasons for growth of offshore operations

by Donna Steigerwald, SOA Public Relations Manager

Increasingly, insurance companies have found it to be to their advantage to locate some of their operations outside their native countries. Associate Editor Jay Novik gathered a panel of experts to discuss the reasons:

- Harris N. Bak, consulting actuary, Milliman & Robertson Inc., New York
- Edward Betteto, senior vice president, Max Re Ltd., Hamilton, Bermuda
- Kin K. Gee, chief life and health officer, ACE Tempest Re, Hamilton, Bermuda
- Robert J. Reale, senior vice president and chief underwriter, Annuity & Life Reassurance Ltd., Hamilton, Bermuda
- Chris Rutten, senior vice president, Max Re Ltd., Hamilton, Bermuda
- Hank Sulikowski, President, Reinsurance Solutions, Port Jefferson, New York

***Novik**—What are we defining as "offshore?"*

Betteto—That's an interesting question. In my mind, the definition of offshore as it pertains to a particular jurisdiction is any company doing business within a domicile that is not regulated within that domicile.

Sulikowski—I would agree that it includes areas that are not subject to U. S. statutory accounting or regulation, but most recently we've seen more activity in jurisdictions where there's no income taxation.

Rutten—I do think it's important to note that offshore reinsurance is not necessarily tax motivated. There are many offshore reinsurers that have elected to be U. S. taxpayers for valid reasons: good, appropriate offshore transactions with little or no tax motivation. So while it seems to me that the tax element is important, the regulatory aspects are in fact much more critical.

Gee—I agree with Chris. I think the whole definition of being not a U. S.-authorized reinsurer is probably as good as any; although the connotation of "offshore" tends not to be the continental reinsurers, but more the island-based companies. There are different tax rates. But I would argue that for life insurers, the effective tax rates on these jurisdictions are not that materially different when you take into account other aspects like letters of credit and Federal Excise

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Jay A. Novik
Editor responsible for this issue

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On bugs, butterflies, and betterment

Now that we have really entered the new millennium, I'd like to reflect on bugs—not the useful flying and crawling kind, but the kind that is always interfering with our modern, somewhat technologically oriented lives.

In mid-December of 1999, I encountered a notice in my New York co-op warning me that our elevators might not work after midnight. I had previously been advised by various sources to stock up on water and to obtain cash from the ATM, since the machines, and indeed the banks, might not be functioning after year-end.

Fortunately, nothing much happened after midnight on December 31. Lights stayed on in New York and Moscow, proving that our computer technology (whether legally obtained or not) works in Russia as well as in the United States. While Y2K presented significant issues, the hard work of many individuals, companies, and governments, spurred by intense media focus, minimized the consequences.

I contrast the Y2K problems to the bug in the U. S. presidential election process. Like the millennium bug, the potential for electoral problems has been well known for years. Unlike Y2K, there has been little media focus. News anchors prefer to portray the election process as organized and precise and as if every vote gets counted, free of error or fraud. Not true. Not here. Probably not anywhere.

C-SPAN extensively covered the lower court trials during which experts described the functioning and non-functioning of badly outdated voting machines, which were the source of many of the alleged problems. Chad buildup and other mechanical problems were known to exist, as explained by both engineers and political scientists.

Other issues included the use of "butterfly" ballots, known to be a potential problem since the machines were invented. Not covered extensively was outright fraud. Voting fraud was the focus of controversy in another very close election—the 1960 Nixon-Kennedy contest. One politician was reported to have expressed a wish to be buried in Cook County, Illinois, so that he could continue to participate in the election process. And contrary to national media coverage, voting problems are not limited to Florida or Cook County.

With the presidential election over, the media focus will shift, and interest in the electoral problems may wane. This is unfortunate. While U. S. presidential elections are rarely "too close to call," many state and local elections are often very close. And one presidential election like this is enough. If we apply only a small percentage of the money, intelligence, and media focus to this problem that we applied to the Y2K problem, we can significantly improve the process.

Do these comments have any special applicability to actuaries or actuarial science? Possibly. In our business activities, we often encounter problems of both the Y2K variety (clear and present danger with much media attention) and the election variety (less obvious, but persistent and troublesome.) We frequently overkill the former and wait too long to deal with the latter—something to be mindful of as we begin a new year.

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Tax (FET) on premium as opposed to FIT on taxable income. For our purposes, I think we can agree on it's being outside the U. S. and probably Caribbean-based, which would include Bermuda.

Novik—*What's the most important issue for companies being set up off shore?*

Rutten—I would suggest: investment, accounting, and regulatory flexibility.

Novik—*From a U. S. perspective, Bermuda is the major domicile. What are some others? What about Barbados, Dublin, and the Cayman Islands?*

Gee—I think if your audience is U. S. and North American, my guess is that Dublin is not a major factor; it may tend to be more continental Europe.

Novik—*Dublin-domiciled companies are quite active in the United States.*

Harris—You have Rhine Re, a former Bankers Trust subsidiary, located in the Channel Islands.

Novik—*Recently, there has been an explosion of offshore life reinsurance activity. Why?*

Reale—Let me start by tackling why life reinsurance in particular has developed contrary to what has historically been the life reinsurance market back in the 70s and early 80s—more service-oriented. I think in the 80s and 90s, you had more companies concerned about getting a better price. Recent surveys conducted by or for the SOA have demonstrated that. So what has transpired is that in a domicile like Bermuda, you can set up a reinsurance company and provide a lower cost vehicle to the company selling mortality-related products. The market has shifted to the price-conscious mode.

Novik—*Why can you offer a lower price?*

Reale—I would say there are a number of things. One is the expense, the overhang of historical liabilities and multiple accounts. Two, we're not looking to provide many of the services that companies may not need. Three, we have a better tax structure. Four, we have an easier regulatory environment to work in.

Gee—I'm not disagreeing with Bob, but I think there are other reasons for the offshore market growing the way it is, beyond just price. We could probably just look at the property casualty, both insurance and reinsurance. Back in the mid-80s, the property casualty had a liability crisis, and in response to that, two companies were formed in Bermuda—Ace and Excel. In the late 80s, the formation of Centre Re responded to a need for large capacity of property and casualty finite risk reinsurance in addition to the current market at that time. In the 1992-3 era, in the wake of Hurricanes Andrew and Iniki, over $4 billion of capital came into Bermuda to form a number of property catastrophe reinsurance companies. I think all of that was in response to either shortage of capacity or a certain need that the U. S. market was not serving. I believe that that is analogous to certain parts of the life business as we see it from North America. We see a lot of restructuring that's continuing in the consolidation and demutualization of the industry. And there have been demographic trends and shifts with the products. All of this results in needs for reinsurance transactions that are a bit different from the traditional life reinsurance market. The traditional life reinsurance market is still robust and is well served by the U. S. market. I do agree that there is a lot of pressure or certainly a lot of demand by the client company for price, and that partially is being met off shore. But I think that the need for the non-traditional life reinsurance transaction as part of the trends that I mentioned earlier drives some of that formation of offshore companies. If we look at the business model of at least three of the companies that are present in this discussion, they're not necessarily in the traditional life business. It won't be their major focus. Speaking just for ACE Tempest Re, we believe we would be an interesting partner in some of the larger transactions for annuities and in force blocks of business that will take place in the next several years because of the changes that are happening in the industry.

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Novik*—Why were they set up in Bermuda and not in the United States?*

Gee—There are several reasons. On the supply side, we have already mentioned some of the advantages such as investment, accounting, and regulatory flexibility. I guess I was just referring to the demand side, rather than the supply side.

Sulikowski—I think it really boils down to price and flexibility. Although there was no real defining issue, such as a need for more capital in the life reinsurance sector, new entrants are coming into the market with the ability to provide traditional reinsurance products that are equally or more competitive and also with the flexibility to provide non-traditional reinsurance products that are driven more by strategic reasons, such as a desire to use capital more efficiently.

Harris—I agree with Kin. We talked about the tax arbitrage, but there's also a tremendous amount of capital arbitrage. I think a lot of the demand for new reinsurance from the newly restructured companies won't be motivated by statutory surplus relief as in the past, but they will have the ability to re-deploy capital and improve their GAAP returns on equity. If you redeploy capital, reinsuring and freeing up statutory capital from one company to another onshore company, it's a zero-sum game. You haven't created any value. If you move business to an offshore location where there's less required capital, either for regulatory reasons or for rating agency reasons, you've basically freed up capital, which in turn will improve the combined ROEs. I think the offshore companies have ways to use less capital.

Betteto—I think that you've hit the nail on the head, Harris. A more flexible regulatory environment definitely reduces the cost of business. I prefer different terms than "capital arbitrage;" the analogy I have is that it's a form of leverage. An offshore company has to provide the collateral equal to the statutory reserves. There are certain companies in the United States that can handle those requirements by their own more traditional leverage. Offshore companies (an analogy I don't know has been used very much) have a different kind of leverage. We do have to provide the collateral, but as Harris indicated, it's not equity.

Rutten—The investment flexibility in offshore jurisdictions is of considerable value; it is virtually impossible to execute strategies along those lines as an onshore-regulated company. And another point we haven't addressed yet is access to appropriate risk management facilities from an offshore location. For instance, the risk transfer provisions for regulated reinsurance arrangements in the United States are very punitive. In many offshore environments, you can manage portfolio risks by partially addressing specific risks in your portfolio rather than having to cede out all of the risks in order to get any credit for ceded reinsurance reserves. That's very important. The risk management flexibility that you have off shore is certainly critical.

Novik*—There's been a lot of talk about securitizing risks. This is a newer concept for life companies, but one that's been expanding in non-life, especially catastrophe, risk management.*

Reale—I would agree with that. We've done that.

Betteto—Jay, you had asked earlier why there was a big increase in offshore transactions over the past couple of years, and I think the reason is fairly clear. I think that the increase has stemmed from permanent transactions rather than temporary balance sheet engineering transactions that have been an icon over the past several years. The last two years have seen a dramatic increase in permanent transactions—M&A sales, M&A type transactions which do not provide for recapture provisions. Are you guys seeing that as well?

Reale—Yes. That's what we do.

Harris—We're seeing a number of companies now that are swapping blocks of business, selling DI business, buying annuity blocks, buying life blocks, selling group blocks. Because of GAAP earnings and the stories they want to tell the public, they are more interested in focusing and disposing of nonproductive lines to companies that can manage them better. And sometimes that involves just direct companies or onshore reinsurance companies, and frequently does involve offshore reinsurers.

Reale—My company's business is primarily on a permanent basis. With respect to blocks of business, we've seen a lot of activity from the demutualizing companies and recently demutualized companies. Those companies, in particular, have used reinsurance to shed under-performing blocks of business.

Gee—But, Harris, we have seen some of those transactions for certain lines of business, like group long-term disability.

***Novik**—Unfortunately, the current environment reminds me of the early 80s in the reinsurance business. There was a big surge of quota share programs with many compa-*

The power of financial modeling tools, and the technology underpinning them, increases every year. As this power escalates, there is danger that professionals utilizing these models will believe, and convince others to believe, that their results enable management to control risks with a high level of certainty.

Handle assumptions with care

However, embedded in the complexity and sophistication of these models are a host of assumptions. It is often too easy to "feel good" when all the assumptions are set, inadequately challenging or analyzing sensitivity of these assumptions. Forgotten often is the reality that the business has to be carefully and adroitly managed to achieve many of the assumptions.

This problem can be observed in examples such as projections of U.S. budget surpluses, the blow-up of the Long Term Capital Management fund, projections of U.S. Social Security and Medicare funds, and the recent demise of General American Life.

The human (vs. technical) risks include:

◗ Unquestioned acceptance of a sophisticated "black box"

◗ Professional resistance to challenging "beautiful technological tools"

◗ Inherent presumptions that the future will look like the past and that past models, data, rules and structures will continue to be valid

◗ Building tight systems in various functional areas, with no overarching system to address risks that involve interaction of the pieces, so that critical risks fall between the cracks of the models

◗ Failure to differentiate between facts, historically validated assumptions, and professional assertions

◗ Choosing time periods for validating assumptions that justify one's theories

Often, early success with a risky strategy leads to both the blurring of the actual risk and aggressive expansion of the activity. These "bet-the company" ventures almost always (eventually) lead to the demise of the company. Many U.S. life insurance company failures of the past decade were attributable to these kinds of management failures.

The unknowable future

One additional interesting illustration is found in an article by John Bogle published in the October 2, 2000, issue of *Fortune*. Discussing his apprehension about "statistical support" for continued stock market increases, he says, "…the future is not only unknown but unknowable. Yet with the acceptance of 'modern portfolio theory,' the ease of massaging data with the computer, and our existence (at least in the U.S.) in today's era of remarkable political stability combined with powerful economic growth, investors seem to have developed growing confidence that they can forecast future returns in the stock market. If you fall into that category, I send you this categorical warning: The stock market is not an actuarial table."

What does all of this have to do with actuaries and actuarial analysis? Past surveys rate actuaries very high in terms of intelligence and integrity. On the other hand, actuaries are sometimes accused of lacking broad perspective and sufficient humility. It's the latter two traits that can get us into trouble.

We actuaries need to make sure that we develop and reconcile two approaches to each effort that we undertake. In addition to doing the necessary, actuarial "bottom up" assumption-setting and analysis, we need to simultaneously address each assignment from a top-down perspective, validating the reasonableness of our detailed actuarial analysis within its larger, real-life context.

Bob Shapiro, editor-in-chief of* The Actuary, *is president of The Shapiro Network Inc., Milwaukee, Wisc. and principal of NxtStar Ventures L.L.C. He

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Novik*—Are you able to impose liquidity constraint offshore?*

Harris—Yes. It's not a violation of any regulations in Bermuda to sell a variable life in which the cash values are only available once a quarter or once a year—or even the death benefits.

Sulikowski—So long as you comply with the investment requirements of the tax code, which really focus on control over the investments and diversification requirements.

Novik*—You have the flexibility to design more sophisticated products for a more sophisticated audience. Is that accurate?*

Harris—That's correct. Of course, to the extent that the purchasers are U. S. taxpayers, you still have to comply with 7702 and similar laws.

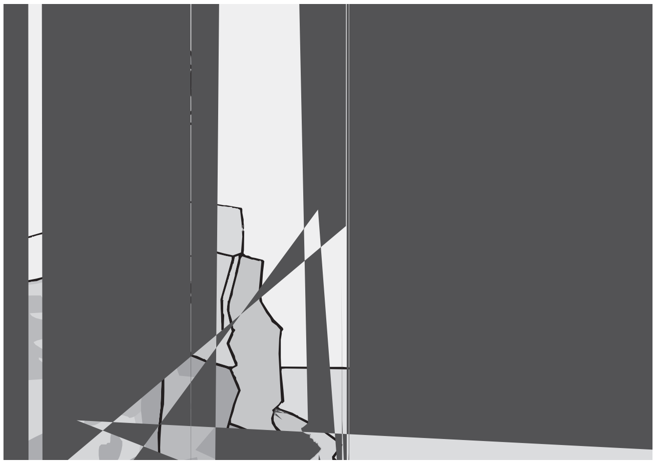
Novik*—What are the disadvantages of operating from offshore?*

Harris—The excise tax is a disadvantage, but not for those companies that have elected to be U. S. taxpayers.

Reale—Excise tax gets in the way in certain product lines. For pure surplus relief deals and closed-block reinsurance for RBC relief, excise tax costs are quite high relative to the risk charge. Also, there's a marketing disadvantage. Smaller companies have a perception of offshore companies as thinly capitalized. That's because many of the offshore companies in the Caribbean historically have been set up purely as a surplus relief, thinly capitalized operation. We obviously clear it, but there's always that hurdle.

Gee—I think, like Bob said, you do clear those hurdles when you present your financials. I think all these companies have several hundred million dollars or more capital in surplus. But some U. S. clients still require an approval, an exception if you deal with an offshore insurer. But once you present your financials and have substantial capital, and you're a viable, ongoing concern, that's not an issue.

Reale—Another disadvantage of being offshore in life business is that there are services that many companies still desire and need. As a Bermuda-based company in an expensive environment, it's very hard for us to get the talent here to service that. So there are certain accounts that we cannot provide service for.



Novik*—How much of your business is broker produced?*

Reale—I can speak for Annuity and Life Re. Almost all of it is not coming from brokers. It's from companies that know us and call us directly.

Novik*—What is it like living and working in Bermuda?*

Reale—The culture here is a little more laid back, as far as the Bermudans go. As far as living in Bermuda, when you look to buy things or get service here, it's limited.

Gee—I'm newer to Bermuda than Bob. In addition to the sunny weather, I would say that the community here is close knit, which, I think, is a good thing. People welcome you to the island. Expatriates here seem to be more closely knit, I suspect, than in a large metropolitan city. Because there's a smaller population, people in the professional community tend to know each other better.

Reale—The people are very friendly, as Kin said. I find myself saying "hello" to strangers as I walk by them in the street, and I wouldn't do that in New York.

Rutten—The offshore market is also a very exciting work environment, with a talent pool of people who are all excited to be active in new and innovative transactions and want to be in the forefront of development. For actuaries who like to get involved in that and take a little jump in their career and try something new and different, this is absolutely a terrific environment to be part of.

Sulikowski—I'd echo that sentiment. It's almost as though you have the best of both worlds. You're operating in a business environment that moves as quickly as it would in places like New York, and yet the living environment is much more relaxed and friendly.

Novik*—Are new life companies being formed? Is there room for them in the market? Is there room physically?*

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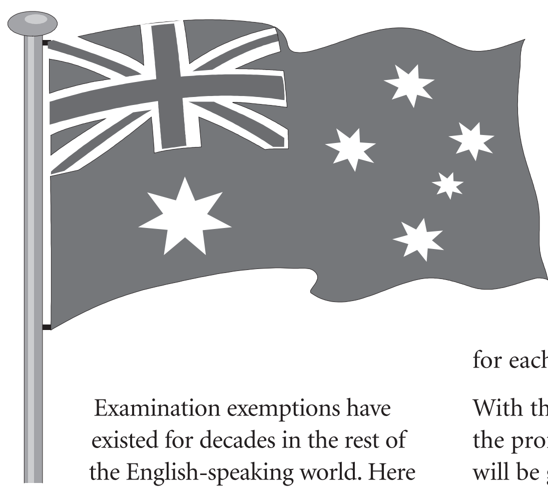
How actuarial exam exemptions work in the U.K. and Australia

by Robert L. Brown, 2000-2001 SOA President

The idea of "exam exemptions" often gets a negative reaction when I speak about it at actuarial clubs in North America. This may be because the vision the term conjures up is one of the profession handing over control of its standards and possibly opening the door to potential members getting exam credit for university work that reflects variable quality and rigor.

The professional actuarial organizations in the United Kingdom and Australia have found an effective way to recognize high quality university education without compromising their standards or their control over the education and qualification of the actuary.



Examination exemptions have existed for decades in the rest of the English-speaking world. Here is a very brief outline of how they work in the U. K. and Australia.

First, the actuarial profession controls the exemption 100%. Only a limited number of universities are even eligible to apply for course exemptions (about eleven in the U.K. and four in Australia). Universities are chosen because they are of very high quality; they have enough actuaries on staff to teach the truly actuarial courses and to provide tutoring to actuarial students; and the programs attract high-quality students.

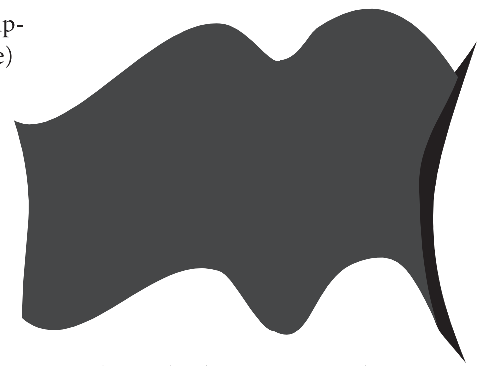
Once a relationship has been established with a university, and once that university asks for the right to grant "exemptions," then the full process is put into motion.

Let's consider one particular example. Let's say that the University of Kent in England wants to be able to grant exemptions to its students in the topic (course) of compound interest. The U. K. actuarial profession will initially review the course syllabus content and the assessment mechanisms together with details of the teaching arrangements as a condition of the exemption agreement.

The next stage is for the U. K. actuarial profession to assign an actuary as an "external" examiner to that course at that university. The actuary will review the course tests to see that they meet an established standard (this includes the final exam, which must be a time-constrained, unseen examination similar to the professional examinations). Finally, the actuary will review the results of the overall grading for each student.

With this data in hand, the actuary (not the professor) will decide which students will be granted exemption for the corresponding Institute examination on compound interest. Let's say the exemption criteria set by the actuary for that session in that university is a grade of 82%. (Note: it is never 50% nor anywhere near 50%). For students who received grades of 82% or better, the Institute is saying that there is really no reason for them to write a separate Institute exam, as the probability of their passing is so extremely high.

In fact, there is a mass of data to show that the students with marks just below 82% who do not receive exemption, but then go on to write the Institute exam, do extremely well. Thus, the profession can virtually "prove" that the exemption system does not depreciate standards.



Obviously, this system may be more difficult to implement in North America where dozens of universities may apply to have "exemption" rights (the "accreditation" criteria could be set in a manner that would only admit a very small number of programs at first). However, the fact that there are both good and weak universities and professors does not come into play. The external examiner (FSA) will be able to determine the "goodness" of the program, the course, and the students, and set an objective standard for the granting of exemption—in fact, a standard so high as to virtually guarantee that the student granted exemption would have passed the professional examination.

I say this not because the Society is actually considering any route of "exam exemption" at this time, but rather to achieve a more healthy dialog around this interesting option that exists almost everywhere else in the world.

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Reale—In Bermuda, there are obviously some space limitations. There's a tendency for companies to be smaller staffed, so it's less of a problem. I think what we've run into especially on the actuarial side are two issues. One, actuaries tend to be more cautious about moving around, especially to another country. Secondly, for actuaries with children, there's not enough school space. Countries like Bermuda sometimes require, either formally or informally, that if you're bringing an expatriate on the island, they may not have more than two children attending school. And even at that, there may not be room for the children in the schools you want them to attend. Also, spouses may not be able to get work permits, unless they have a specialized field, or may not find any employment opportunities. So there are certain restrictions because of the nature of the country as to who you bring on board, and that may restrict what you do.

Betteto—Bob, you certainly make a valid point, but because of the fact that it's a low labor-intensive business, is it a tolerable thing? Our prediction is that there's going to be a number of new players. We all have slightly different business models, and I think that there's going to be growth in all of our businesses, whether it's risk reinsurance, financial, or whether it's in our field, which you might call asset reinsurance. I think that over the next several years, balance sheets of life insurance companies are going to be proportionately smaller simply because, as Harris said earlier, there are some blocks of business where the assets and liabilities are more efficient in an offshore company than a domestic company. It is difficult to match fixed-income assets to long tail liabilities; on the other hand, regulators have made it inefficient for domestic companies to hold equities or other alternative assets on their balance sheets. An offshore company simply has more flexibility to manage investment risk in an integrated manner with the risks on the liability side of the balance sheet. The tax advantage, for those of us who are not U. S. taxpayers, is significant, but it actually ranks third behind capital efficiency and asset flexibility.

Reale—I agree with you, Ed. I'm just pointing out that there are some restrictions and forces beyond the natural forces and business models.

Sulikowski—As we see additional capital come into the market, we'll see more price competition; but I think one of the factors that will continue to differentiate the individual players in the market will be their appetite for risk. There are some distinctions among existing and proposed new players. Some companies focus on shorter-term structures, some on mortality risk, while others seem more willing to assume longer tail or investment risks. To the extent that we continue to see some distinctions among the new entrants, I think there's room for growth.

Novik*—There's been some press lately about companies in "tax haven" countries unfairly competing with U. S. companies. Anyone want to comment on this issue?*

Gee—I don't think that's a major issue right now.

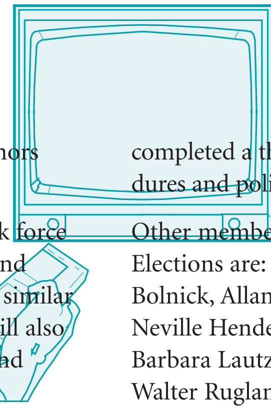
Novik*—I don't think there's generally an unfair advantage, and if you try to deal with it, then you have the question of how do you deal with the whole world. We've got lots of non-U. S. companies operating in the United States and they can be siphoning off business almost anywhere in the world.*

Gee—Conversely, Jay, you've also got a lot of American companies that have huge international operations and when you look at their effective worldwide tax rate, it's in fact a lot less than has been represented.

Sulikowski—Reinsurance is necessarily an international business, and I think it's unlikely that any action would be taken to disturb the delicate balance. If anything, I would think the focus of any action would be on affiliated transactions.

Novik*—Thank you all for your participation.*

Stay tuned…



Convened during the Annual Meeting last October, a new task force has begun the process of reviewing how the Society of Actuaries currently identifies and elects leaders.

The official charge of this new Task Force on Elections is "to review the process and procedures for the election of officers and Board members to ensure the Society is selecting the best quality members for its leadership positions. It will recommend changes to the Constitution, Bylaws, and procedures to the Board of Governors that it believes appropriate."

In addressing its challenge, the task force will be reviewing the procedures and practices used by organizations of similar size and professional scope, and will also be emphasizing communication and interaction with members.

Stuart Wason, immediate past president of the Canadian Institute of Actuaries, chairs the task force. He brings extensive, recent experience with such work. The CIA just completed a thorough review of its procedures and policies for electing leaders.

Other members of the Task Force on Elections are: Robert Beuerlein, Howard Bolnick, Allan Brender, Norman Crowder, Neville Henderson, David Holland, Barbara Lautzenheiser, Richard London, Walter Rugland, Patricia Scahill, and Jack Turnquist.

Messages or input for the task force can be given to any member or sent to the Society office at *electiontf@soa.org.*

Redington Prize nominations due

The SOA Investment Section Council is now seeking nominations for the next Redington Prize.

A $2000 award for the best paper on an investment-related topic written by a Society of Actuaries member, the biennial award is sponsored by the Investment Section to promote investment research. The prize is named after F. M. Redington, the eminent British actuary who, in a 1952 paper published in the *Journal of the Institute of Actuaries,* coined the term "immunization."

Criteria for prize eligibility are:

Publication years—The paper must have been published during the calendar years 1998 or 1999.

Author—The author of the paper must be an SOA member. In the case of a paper with multiple authors, an SOA member must be a major contributor to the paper's content.

Content—The topic must be judged as timely, primarily of investment nature, and of substantial value to SOA members.

Source—The paper may appear in any recognized SOA format, including *North American Actuarial Journal, Transactions, ARCH,* study notes, and section newsletters. It may appear in non-actuarial journals or publications deemed to be of at least comparable quality by the Prize Committee. Such publications include, but are not limited to, *The Journal of Portfolio Management, Financial Analysts Journal, Journal of Finance and Journal of Financial and Quantitative Analysis.*

If the paper is a result of an SOA seminar or colloquium, it must have been published either in a conference book available to the membership or in an acceptable journal. These journals, books, and newsletters must have been published in 1998 or 1999.

Judging—Selection criteria will include factors such as investment content, originality, practical significance, timeliness, relevancy, and educational value to the membership. A prize will be awarded only if the Prize Committee deems the best eligible work to be of sufficient merit to justify an award. The Prize Committee members are Nino Boezio, Steven Craighead, Luke Girard, Jeremy Gold, David Li, John Manistre, Robert Reitano, Michael Sherris, Elias Shiu, Ken Seng Tan, and Richard Wendt. The final decision for any award will rest with the Investment Section Council.

Submission—The paper must be submitted by May 31, 2001, to Luke Girard, Lincoln Investment Management, Inc., 200 East Berry Street, Fort Wayne, IN 46801–7814, or e-mailed to *lgirard@lnc.com.*

The five previous winners of the Redington Prize are:

- "The Risk of Asset Default" *TSA XLI* (1989): 547-582 by Irwin T. Vanderhoof, Faye Albert, Aaron Tenenbein, and Ralph Verni.
- "Multivariate Duration Analysis," *TSA XLIII* (1991): 335-376 by Robert R. Reitano.
- "Multivariate Stochastic Immunization," *TSA XLV* (1993): 425-461 by Robert R. Reitano.
- "Interest Rate Risk Management: Developments in Interest Rate Term Structure Modeling," *NAAJ Vol. 1 No. 2* (April 1997) by Andrew Ang and Michael Sherris.
- "Quasi-Monte Carlo Methods in Numerical Finance," *Management Science* (1996) and reprinted in Chapter 24 of *Monte Carlo: Methodologies and Applications for Pricing and Risk Management* (1998) by Corwin Joy, Phelim Boyle, and Ken Seng Tan.

Women actuaries honored by *Business Insurance* magazine

Business Insurance magazine included ten actuaries in its salute to "100 leading women in the industry" in its October 2, 2000, issue. Those who made the list were chosen as the top women working in the commercial insurance, risk management, employee benefits, and related fields.

Among those honored for their "professional achievements, influence on the marketplace, and contributions to the advancement of women in the insurance business" were SOA Past President Anna Rappaport (principal, William M. Mercer Inc., Chicago), Actuarial Foundation trustee and past president of the Casualty Actuarial Society Mavis A. Walters (former executive vice president, Insurance Services Office Inc., Washington), and SOA member Susan J. Velleman (managing director, William M. Mercer Inc., Boston).

Women receiving the *BI* honors were recognized for their accomplishments, whether they were presently moving up the corporate ladder or had broken barriers years ago, laying groundwork for women today to follow in their footsteps.

In compiling its "top 100" list, the magazine measured a candidate's influence by not only what she does for her own organization, but also by her participation in professional organizations and other activities that promote professionalism in the business. Honorees were recognized for serving as role models, privately mentoring other women, helping to create a more woman-friendly atmosphere where they work, and possessing leadership initiative in women's organizations.

Business Insurance publisher Kathryn J. McIntyre called the group "women of achievement, influence, and leadership in a business community that is without a doubt still dominated in the management ranks by men." The magazine undertook the project of developing the list of women industry leaders, she says, "because we wanted to celebrate how far women have advanced in these fields, mostly in just the last two decades."

According to the magazine, the number of women in top positions within the insurance industry is minimal in comparison with the entire population of women in the industry. It stated that "cultural and work/family benefits concerns still remain obstacles for women in the industry, and they still have to work twice as hard as their male counterparts to gain the same recognition and promotions."

Anna M. Rappaport (left), honored as one of the "100 Leading Women" in the industry by *Business Insurance* magazine, received congratulations from the magazine's publisher, Kathryn J. McIntyre.

Statistics compiled by New York-Catalyst, a non-profit organization working to advance women in business, show that 14%, or 184, of the 1,318 corporate officers at Fortune 500 life/health and property/casualty insurance companies in 1999 were women. The number of women board members at Fortune 500 insurance companies in 1999 had increased by 29%, to 101, from 72 in 1996.

Retirement research grant program includes actuarial science

The Center for Retirement Research at Boston College is soliciting proposals for the Steven H. Sandell Grant Program for Junior Scholars in Retirement Research.

The program promotes research on retirement issues by junior scholars in a wide variety of disciplines, including actuarial science, demography, economics, finance, gerontology, political science, public administration, public policy, sociology, social work and statistics. Grants of up to $25,000 will be awarded for each successful applicant.

The program is funded through a grant from the Social Security Administration (SSA). Successful applicants will be eligible to apply for access to restricted data sets and will present their results to SSA.

The deadline for proposals is March 16, 2001. Awards will be made in May 2001 and final projects will be due within a year of the award. Information is available on the Web at *www.bc.edu/crr* and from Elizabeth Lidstone, the center's research coordinator (phone: 617/552-1677; e-mail *lidstone@bc.edu*).

The Universal History of Numbers

by Georges Ifrah (Wiley)
600 pp. ($22.95 paper, $39.95 hardcover)

reviewed by Gordon Leavitt

If you've ever wanted to know how many civilizations invented positional notation (three: Chinese, Indian, and Mayan) or the number zero (two: Indian and Mayan), this is the book with all the answers. Starting at the very beginning, Mr. Ifrah thoroughly develops the archeological and written evidence to show how ancient cultures calculated and kept numerical records.

What is most interesting, of course, is that this is one area where Western civilization adopted non-Western ideas, originally Indian numbers, but transmitted to us by the Arabs. How is it that the Indians, rather than the Greeks or Romans, invented zero and positional notation? The answer is apparently related to the fact that very large numbers are important to Indian cosmology: Buddha lived 3.31 x 10^{14} years, and there are 8.4 x 10^{21} Indian gods. It would be difficult to express these in Roman numerals.

Why was it so difficult for Westerners to attach a number to the idea of the empty set? The Indian philosophers and mathematicians had many words for the "void:" the non-created, the unformed, the unthought, the insignificant, nothing. Going into such detail, the author will tell you more than you really want to know about Indian mathematics, which seems to have been closer to philosophy and cosmology than is Western mathematics.

Mr. Ifrah is Moroccan and writes in French, but the English translation is idiomatic. The book has massive documentation and a full bibliography.

***Gordon Leavitt may be reached at* gmleavitt@aol.com.**

Exam prep aids offered

Exam 3 Seminar in Texas

Dr. James W. Daniel will conduct an eight-day intensive seminar on SOA/CAS Joint Exam 3 from March 31 through April 7, 2001 in Austin, Texas. For more information, contact him at 4212 Cat Hollow Drive, Austin, TX 78731-2004, phone or fax at 512/343-8788, or visit the Web site at *www.actuarialseminars.com.* Registration deadline is March 2, 2001. Enrollment is limited to 20 participants

First international pension seminar scheduled for June

The first IAA International Pension Seminar will be held in Brighton, U.K., on June 6-7, 2001. Additional information about the seminar, including a call for papers and pre-registration form, are available on the IAA Web site at *www.actuaries.org* under the "Meetings" button, "Seminars and Conferences."

Study 11CIP8 available for May 2001 exams

Actuarial Study Materials (A.S.M.) has published these study manuals for the May 2001 exams: EA-1, EA-215, Courses 1, 2, 3, 4, and 6.

You can order the manuals from ACTEX, the exclusive distributor, on the Web at *www.actexmadriver.com* or by calling 1/800/282-2839.

Review seminars to be held in Philadelphia

These intensive review seminars will be offered in Philadelphia in the spring:

- Temple Actuarial Institute—
  Course 6: March 29-April 2
- CAMAR (Casualty Actuaries of the Mid-Atlantic Region)—
  Course 1: April 18-22
  Course 2: March 30-April 1, April 27-30
  Course 3: March 17-19, April 19-22
  Course 4: March 16-19, April 20-22

For further information, contact Bonnie Averbach at 215/204-8153, or visit the Web site at *http://sbm.temple.edu/~rmidept/actsci.htm.*

Call for papers

The *Journal of Actuarial Practice* invites authors to submit papers for possible publication. Papers may be on any subject related to actuarial science or insurance and do not have to contain original ideas. The journal also accepts commentaries and book reviews. All papers are refereed (peer reviewed) and must have some relevance to actuarial practice.

For consideration, send an abstract of the paper as soon as possible to:

Colin M. Ramsay, Editor
Journal of Actuarial Practice
P.O. Box 22098
Lincoln NE 68542-2098, USA
Phone: 402/421-8149
Fax: 402/421-9190
E-mail: *absalom1@ix.netcom.com*

Electronic submissions by e-mail are preferred, provided they are in Microsoft Word or WordPerfect. Deadline for submission of the completed paper is March 1, 2001.

Actuarial positions available

Actuarial science professor

A tenure-track faculty position to be filled starting June 2001 is available at the School of Actuarial Science, Laval University.

◗ Duties: teach and counsel undergraduate and graduate students; conduct research in actuarial science; contribute to the academic, administrative, and professional activities of the school. Teaching at Laval University is conducted in French.

◗ Qualifications: either hold (or be near completion of) a Ph.D. in Actuarial Science or a related discipline; be well engaged in actuarial research; be (or be close to being) a member of a recognized association of actuaries or a Fellow of a North American actuarial association; have research experience or hold a master's degree in an area related to actuarial science; demonstrate at least five years of professional experience.

Laval University intends to hire women to fill half of its vacant positions. Priority will be given to Canadian citizens and permanent residents.

For more details, visit the school's Web site at *http://www.act.ulaval.ca*. To apply, submit a curriculum vitae and three letters of reference before March 1, 2001 to:

Professor Michel Jacques, Chair
École d'actuariat, Pavillon Vachon
Université Laval
Ste-Foy (Québec) Canada G1K 7P4

It is considered an asset if candidates with an academic background submit course evaluations and if candidates from the profession submit an appropriate evaluation of any communication experience.

Tenure-track position

The Department of Statistics at the University of Central Florida invites applications for Assistant Professor or higher (depending on qualifications and experience) to start August 2001. Qualifications include a Ph.D. by date of hire and demonstrated or potential for excellence in both teaching and research. Preference will be given to those specializing in actuarial science, data mining, statistical computing, or statistical genetics.

Send a letter of interest, resume, transcript, and arrange for three letters of reference to be sent directly to:

Search Committee
Department of Statistics
University of Central Florida
Orlando, FL 32816-2370

All applications will be considered until the post is filled.

For more information, call the department at 407/823-2289 or visit its Web site at *http://www.cas.ucf.edu/statistics/* or the actuarial program page at *http://www.cacs.ucf.edu/statistics/programs/acts.htm.*

UCF is one of the nation's fastest growing universities with a current enrollment of over 34,000 students. It is located in Orlando, approximately 50 miles from the Atlantic coast and 100 miles from the Gulf of Mexico. Faculty at UCF enjoy the same combination of climate and recreational activities that draws millions of visitors to the area each year. In addition, a vigorous economy with a high-technology component provides special opportunities for all statistics faculty.

UCF is an equal opportunity, affirmative action employer. Women and minorities are strongly urged to apply. As an agency of the State of Florida, UCF makes all search records available for public inspection.

Program director, mathematics and actuarial science

Maryville University of Saint Louis, an independent, student-oriented university founded in 1872, invites applications for a full-time, tenure-track position in Mathematics and Actuarial Science beginning in August 2001.

◗ General Qualifications: demonstrated excellence in undergraduate teaching in the stated area, strong leadership abilities, entrepreneurial insight, good communication skills and enthusiasm for cultivating a sense of community among all student constituencies of the University.

◗ Specific Qualifications: Ph.D. in mathematics, preferably in a field related to actuarial science; Associateship of Society of Actuaries or equivalent and a proven ability to collaborate with colleagues and higher administrators. Responsible for general program director duties, curriculum, and growth of the actuarial science program; active support of recruitment and retention efforts of actuarial science majors; strengthening and maintaining strong ties with the professional actuarial community.

◗ The Program: ranked as Advanced Undergraduate Actuarial Program by the Society of Actuaries, with currently between 45 and 50 full-time students and an average ACT score of 31 in mathematics. Most of the students have summer internships after their sophomore year, and almost all of the juniors and seniors have actuarial employment during the school year.

◗ Rank and salary: based on qualifications and experience.

Review of applications has begun and will continue until the position is filled. Send cover letter, resume/vitae, two letters of recommendation, and the names of three professional references to:

Dr. Lorraine Rodrigues-Fisher,
VP Academic and Student Affairs
Maryville University of Saint Louis
13550 Conway Rd.
St. Louis, MO 63141-7299

Maryville University is an affirmative action, equal opportunity employer.

research corner

Health News

"Evaluating Managed Care Effectiveness: A Societal Perspective" written by Jill Schield, James J. Murphy, and Howard J. Bolnick is now available and can be found on the Society of Actuaries' Web site *(www.soa.org)* in the main Research area. This analysis provides an overview of the functional components of the managed care system. It discusses the market forces underlying the U. S. system for health care financing and delivery and suggests how market forces impact the health care industry. The analysis focuses on societal goals for health care delivery and on managed care's effectiveness in enabling achievement of those goals. This report may be ordered from the SOA Books Department by calling Beverly Haynes at 847/706-3526.

Life News

A new monograph, "Why Men Die Younger: Causes of Mortality Differences by Sex" by Barbara Blatt Kalben is now available in pre-publication form. This well-documented paper attempts to synthesize the evidence supporting and refuting the hypotheses for the sex mortality differential. Evidence supports both the biological and the environmental hypotheses, as well as interactions between the two; but the determining component may revolve around the differing chromosomes and hormones of males and females. The permanent form of the monograph will be produced during the summer of 2001, but the pre-print is available now. To get an order form, go to the Society of Actuaries web site *(www.soa.org/research),* or place a telephone order by calling Beverly Haynes (847/706-3526) in the Books Department.

In order to carry on the research required to continually update the Generally Recognized Expense Tables (GRET), a committee was formed with Sam Gutterman and Timothy Harris as co-chairs. The mission statement for the Committee on Life Insurance Company Expenses (CLICE) is: "This committee investigates, evaluates, and reports on various aspects of expenses of life and health insurance companies. These efforts may include periodic updates of the 'Generally Recognized Expense Tables' for use in sales illustrations in the U.S." The Generally Recognized Expense Table for 2001 Illustration can be found on the SOA Web site at *www.soa.org/research/gret_2001.html.*

A call for papers on advanced age mortality is now posted on the Society of Actuaries Web site *(www.soa.org/research).* Abstracts are due February 15, 2001. Accepted papers will be presented at an international symposium at the Swan Hotel in Disney World, Florida, on January 17-18, 2002. Co-sponsors of the symposium include: Actuarial Genootschap, Actuarial Society of India, American Academy of Actuaries, Canadian Association on Gerontology, Collegi d'Actuaris de Catalunya, Faculty of Actuaries, Institute of Actuaries, Institute of Actuaries of Australia, Institute of Actuaries of Japan, Israeli Association of Actuaries, National Council on the Aging, National Hispanic Council on Aging, and Swiss Association of Actuaries.

Retirement News

The Non-Mortality Decrement Task Force has distributed a data request to pension consulting firms. The goal of this second pension plan turnover study is to produce a series of termination and retirement tables of value in the day-to-day work of pension actuaries practicing in the United States and Canada. SOA is requesting that data be submitted by February 15, 2001.

Correction: In the September 2000 issue of *The Actuary,* an item on page 16 incorrectly referred to the Institute of Actuaries in the United Kingdom as the IAA, rather than the IA. We apologize for the error.

In Memoriam

John K. Kittredge
FSA 1952, MAAA 1965

Irwin T. Vanderhoof, FSA, an SOA member for 42 years, died recently at the age of 72. He served on the SOA board of directors and was 1987-89 vice president. In addition to his work as chairman of the Life Research, Planning, and Research Committees, he authored numerous actuarial and finance papers, including "Asset Loss and Bond Default," which won the SOA Investment Section's biennial award. He was a member of the International Congress of Actuaries and frequently presented papers at national and international meetings.

Vanderhoof's business career encompassed work at many prominent firms, and he served on the boards of several insurance companies. During his 28-year teaching career, he co-edited four finance books for the Stern School of Business at New York University. He was an associate editor for *The Actuary,* as well as for *Contingencies,* where his paper, "Lyme Disease: Cost to Society," co-authored with his daughter, was published.

In collaboration with several colleagues, Vanderhoof obtained a patent in 1999 for a new statistical method, termed "quasi-Monte Carlo," that tackles extremely complex calculations when determining the value of financial derivatives and other complex securities.

His professional designations included Associate of the Casualty Actuarial Society, Associate of the Institute of Actuaries (London), and Senior Analyst of the New York Society of Security Analysts.

Why LTC is a tough sell

In the September 2000 issue of *The Actuary*, I saw the piece on the panel for long-term care (LTC) insurance policies and want to make some comments.

Since I retired at the beginning of 1993, I have been volunteering for the Senior Health Insurance Program (SHIP) sponsored by the state insurance department. In this program, we help seniors by explaining the provisions of health insurance plans, including LTC, and by helping them reconcile their bills with their Medicare EOMBs and their Medigap EOBs.

There are several reasons that LTC policies are hard to sell. The main problem is the high cost. However, another major problem is that most agents selling them do not know how to present the options on which they have to secure choices from the customer. I have seen cases where the agent sells an extremely high daily benefit rate to take care of inflation without ever mentioning the COLA provisions and does not take that into the policy.

Another problem is that agents do not ask the customer about their post-retirement income in determining the amount of daily benefit rate. I asked one agent why he was recommending a daily benefit rate of $150 to a woman with post-retirement income of about $60,000. He answered, "why should she use her own money?" A daily benefit rate of $100 with a COLA would have been adequate and would have been much less costly. It also would have been sufficient to protect her principal.

Most people do not think about LTC until they retire or until they become responsible for someone in a nursing home. They also are not familiar with all of the options that they must think about in buying an LTC policy. These include home health care, COLA, daily benefit rate, duration of benefit, custodial care versus skilled nursing care, and waiting period (exclusion period).

The National Association of Insurance Commissioners has put out a booklet, "A Shopper's Guide to Long-Term Care Insurance," that goes into all of these options. It is available from state insurance departments and agencies on aging, and also defines a federally tax-qualified long-term care insurance policy.

Jim Cowen

Financial planning software and the annuity gap

I read with interest "The Great Annuity Gap" in the September 2000 issue of *The Actuary,* especially with regards to the topic of financial planning software development.

The financial planning market is undergoing significant growth and change. As financial planning software continues to evolve to meet the needs of this market, I quite firmly believe that actuaries and actuarial organizations can add great value to developments in this field.

Of late, financial planning software is evolving rapidly on several fronts, most notably with respect to the stochastic modeling of investment performance in the form of Monte Carlo simulation. Nonetheless, there remains a great deal of work to do, especially with regards to stochastically modeling mortality as Mr. Kellison mentions in the article, for example.

Having spoken to a few developers of financial planning software, there appears to be no general consensus on which mortality tables best fit the financial planning market. A variety of tables is currently in use (the 1983 IAM/IAF tables, 96 Annuity 2000 tables, U.S. Census Bureau Tables, etc.). The development of a mortality basis to address the financial planning market is certainly something to put into consideration, given the widespread growth of the financial planning market. Even though a few software developers have begun to stochastically model mortality, it may be a moot point if the mortality basis itself is not appropriate.

Once again, with all the experience that actuaries have amassed with respect to studying mortality, stochastic modeling, and other financial projection techniques over the past several years, we have an excellent opportunity to become proactive in this market and expand our horizons.

Bill Aguayo

Social Security passes yet another milestone

On August 14, the Social Security program celebrated its 65th birthday, based on the date of the enactment of the Social Security Act. The next month, it passed yet another significant milestone—for the first time the assets of the Old-Age, Survivors, and Disability Insurance Trust Funds exceeded $1 trillion (actually, being $998 billion at the end of August and $1,007 billion at the end of September). This is significant because it indicates that any financing problems that the program may have are not in the near future. The $1 trillion of assets could finance benefit outgo for about 2 1/2 years, even if there were no other income to the trust funds (which, of course, there is from the payroll taxes and, to a much lesser extent, from interest on the invested assets, all of which will be more than needed to finance outgo for many years).

Some persons may say—quite erroneously—that the investments are meaningless, because the monies used to purchase them have already been spent for non-Social Security purposes. However, the real facts of the matter are that this "spending" of the monies is the case whenever any borrower sells bonds or similar securities to lenders. The borrower is obligated to pay interest periodically and to redeem the securities at a designated time.

In this case, the OASDI Trust Funds are given securities with prescribed interest rates, redeemable at prescribed times. These securities are part of the recorded national debt, just as are government bonds held by individuals, insurance companies, and pension funds, and bear interest rates of about 6%. Further, these securities have prescribed maturity dates, and they can also be redeemed on demand at par at any time, a valuable feature for the trust funds that is not usually present in government securities.

Robert J. Myers

Contest puzzle #34: Exam Madness

by Gerry Samp

Seven coworkers who all hold positions as actuarial analysts recently attempted an examination for one of the SOA courses. The coworkers are Zachary, Yvonne, Xavier, Wanda, Vincent, Ursula and Theodore. The exam roster showed their last names in alphabetical order as Abernathy, Biltmore, Covington, Davenport, Edmonds, Franklin, and Grant. Two of the coworkers were originally from Massachusetts, two were from Michigan, and the others were from Manitoba, Minnesota and Missouri.

Several months before the exam, four of the coworkers formed a study group: Vincent, Wanda, Davenport and the woman from Manitoba. At least one of the gentlemen from Massachusetts was a member of this group. Franklin and the coworkers from Michigan preferred to study independently.

The seven coworkers recorded their study time in detail. Covington put in 750 hours of study for this exam, more than any of the other coworkers. Vincent had the second highest number of study hours, but within 45 hours of Covington's recorded time. The mean number of study hours for these seven coworkers was 10 greater than the number of hours put in by Theodore, who studied 40 more hours than Ms. Biltmore, who put in 20 more hours than the coworker from Missouri. Of the remaining coworkers, Ursula recorded more time than Edmonds.

No one studied less than 500 hours for this exam, and the sample standard deviation of study hours for these coworkers was exactly 50.

Grades for this exam were determined in whole numbers. When results were announced, the coworkers learned that no two of them earned the same grade, and the seven grades ranged from 2 to 10. The grade Franklin received was twice the one Davenport earned. Grant, who is neither from Massachusetts nor Michigan, scored higher on this exam than Yvonne did. And the sum of the grades earned by Vincent and Franklin was equal to twice the grade earned by Edmonds, who is not Yvonne.

Yvonne felt that there was a correlation between the hours of study time each coworker recorded and the grade each received. She was particularly amazed by the fact that the ratio of her recorded hours to her grade was equal to the ratio of Vincent's recorded hours to his grade.

Xavier, who is not from Missouri, agreed that there might be a correlation, but insisted that further analysis was required. After all, Yvonne's ratio was 20% larger than the ratio of his recorded hours to his grade. In addition, the coworker who studied the least did not receive the lowest grade.

None of this mattered to Edmonds. She was simply thrilled to learn that her exam grade was greater than 5.

You now have enough information to answer the following questions:

1. What is each coworker's full name?

2. What is each coworker's home state or province?

3. How many study hours did each coworker record?

4. What is each coworker's exam grade?

May Solution, Puzzle 29 – iterate, hangout, article, summary, spikier, ringing, othello, venturi, keyword, violins, gradate, insider, useless, concern, tallyho, editors, empires, inverse, faction, another, startup, sheathe, invoice, revenue, reduced, scented, escheat, freeway, inherit, gateway, rubbles, slender, herself, deserts,

100% Solvers (or thereabouts): W. Allison, S. Alpert, D. Apps, R. & M. Buck, L. Cappellano, H. Fishman, C. Galloway, R. Campbell, J. Gladden, J. Grantier, P. Hepokoski, J. Hill, G. Horrocks, S. Loffree, D. Lueck, J. McIntosh, T. & L. Meyer, P. Morse, D.& C. Promislow, S. Salle & R. Stevens, I. Schaeffer, M. Spevacek, M. Vandesteeg & A. White, C. Velasquez, F. Zaret.
Congratulations to – Mark Spevacek, this month's winner of a Famous Solver of ActuPuzzles mug!

Send solutions to: Puzzle Editor, 753 Revell Crescent, Edmonton, Alberta, Canada T6R 2E8; e-mail—thiessen@v-wave.com.
(Please put puzzle number in subject line of e-mail entries.)