SOCIETY OF ACTUARIES Actuary of the Future Section

Actuary of the Future

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Never Grow Up

By Tom Bakos

Whatever you have been told, whatever you may be thinking—absolutely never, ever grow up. Don't do it. Resist the urge!

It's kind of tempting, I know. Grown up is the top of the hill. But, the end of the road is at the bottom on the other side, and there is nowhere to go once you actually reach the top—except, of course, downhill; coasting all the way; going faster every second; Newton's Second Law of Motion at work. So, if what you want is a no effort, no imagination, no originality ride into the future, then, by all means get to the top of the hill as fast as you can and push off. You don't have to steer. In fact you can't. You'll be guided by the well-worn ruts of all of the others who have gone before you. You're not the first; you won't be the last.

But, here's the thing. We all start out young and foolish—you know: stupid; dopey; childish. We can't help it when we know nothing and our basic learning tool is trial and error which, early on, results mostly in error. We learn from our mistakes; therefore, the more the better. The one thing missing from this trial and error learning process is boredom. Its biggest payoff is surprise.

Have you ever known a child who suffered from boredom? I haven't. Exclude any teenager who thinks he or she is already grown up. I'm talking about children with a spirit of adventure still controlling every waking moment of their lives or not yet grown-up adults, still children at heart, who still crave surprise and by design reject boredom.

Children are designed by nature to be fully involved in a continuing education process involving trial and error from the moment they are born. Until about 1, when they have learned to walk, it is all delivered to them because—well, because they are just so darn

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Actuaries
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Chairperson's Corner

By Jennie McGinnis

When the Actuary of the Future (AOF) Section Council met last November to plan for the upcoming year, we couldn't help but notice how well aligned our section's mission is with the SOA's strategic theme to cultivate opportunities. While thinking about the future of the actuarial profession as the chair of the AOF, I can't help but also consider this theme on a personal level. What is the best use of my talents at this point in my career? How do the activities that I take on now shape which opportunities will be available further down the road?

In pondering these questions I believe that it's limiting to just think about involvement in projects at one's place of employment. Don't get me wrong—the ability to rotate through different departments, work on multi-department projects and serve on an employee activity committee certainly broaden one's view of their firm; but to stop there would limit the ability to learn from an even broader community.

Consider the opportunity to get involved at an industry level, and for the purpose of an example, with the SOA specifically. Serving on an exam committee provides an opportunity to collaborate with those interested in similar aspects of the field while exposing you to how concepts are applied at other firms. Serving on a meeting planning committee provides similar insight, though from a continuing education rather than basic education perspective.

Looking beyond the industry there are also plenty of opportunities to gain new perspectives and skills through organizations in your community. First, consider your passions and interests —seeking out an organization whose mission is aligned will make the work much more enjoyable. Next, reflect on what skills you bring to the table, and which ones you would like to develop. Consider the following:

- Participating on an event committee allows you to practice your project management skills
- Serving on a finance committee allows you to further hone your financial acumen
- Offering your time as a board member provides an opportunity to grow leadership and strategic thinking skills.

In my own experience serving in roles similar to these have "loosened the blinders." That is, being exposed to bankers, lawyers, business owners, educators, etc. has provided me a new way of looking at situations that I can then apply in the workplace.

Can you identify the employer of the following individuals?

- "I am in a competitive environment and I … feel the need to generate revenue."
- "I must be very involved with the key issues facing actuaries and the industry."
- "The job allows me to meet and work with thought-leaders both inside and outside our profession."

- "I really love to connect people to each other—learning of interests and lining them up with someone else who can help them or whom they can help."

I suspect these comments echo with most of us, whether in our current roles or in ones we hope for in the future. Perhaps, then, you'll be surprised to learn that these are a sampling of the thoughts shared by actuaries employed by the SOA. It strikes me that the skill set needed to succeed in the "not-for-profit" realm is not that different from that needed in the "for-profit" world.

All this is to say that while we can grow our skill set by volunteering with various organizations, the possibility of working for these organizations should not be ruled out. Actuaries working in the public sector are nothing new—take, for example, Medicare, Social Security and State Department of Insurance offices. What else can we, as actuaries, offer?

As you reflect on your own career management I hope you'll consider the benefit of volunteering as an opportunity to network and build a diverse set of experiences. Whether the diversity you're seeking is within your company, your industry or your community, opportunities will abound if you keep your eyes open. And, of course, the AOF will be here to provide you with meaningful opportunities along the way!

With special thanks to Joe Silvestri, Mike Boot, Andrew Peterson and Sara Teppema, respectively, for their thoughts, and to all of the SOA staff who contributed their insight in the development of this article. ☆

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cute and irresistible. That, of course, is another good reason to never grow up—to stand out; to be exceptional.

Initially, children focus 100 percent on developing the basic functions they will need to survive and be independent—seeing clearly, hearing, balance, language and understanding, how the hand works and finally, at about 1 year, the ability to walk—and then the adventure really begins. What is that flame-like thing burning on the top of that thing I don't know is a candle? I think I'll put my finger in it and see what happens. Can I fall off a tricycle? You had better believe I can. I think I'll stick with apple juice from now on though. Maybe I'll give orange a try sometime but cranberry and grapefruit? You have to be kidding!

So, the start is at young and foolish. The goal is old and wise on a route that bypasses, if at all possible, the whole grown-up thing. Have you ever seen wisdom riding down the grown-up hill with perfect skin, childhood memories of unremarkable origin, and no idea at all what grapefruits taste like or that milk is not the best drink after cranberries? I haven't. Wisdom leaves a mark that is easy to spot. Old and wise has a story to tell. Old and wise has gotten into a lot of trouble. Old and wise has survived, lucky, perhaps, at the beginning but guided by experience and opportunity and listening to the direction of others who are even older and wiser. Old and wise has gotten old and wise himself—or herself (although she may never admit to old).

It is never too late. Although you may be in the wagon at the top of the grown-up hill about to push off or be pushed off, you can make a choice. You can recover. You really don't have to go where the wagon goes if you don't want to.

How do you fit this philosophy into your actuarial professional career plan? You don't. It's not a plan; it's an attitude. Children don't have a plan. If you don't believe me, ask one. Children take the direction of most fun. They have an outlook—an approach to experiencing life. What is fun to a child—learning? They don't really care what. True, they don't like haircuts. Sitting still for two or three minutes without moving is not a child's idea of having fun. They don't like showers. Why? Have you ever heard of a shower toy?

My oldest grandchild is Jay, with 5 years of exploration and adventure under his belt. He will always accept an opportunity to go to a toy store. Why? Because there are toys there—not toys he already has but new toys of wonder. He carefully examines each one, up and down every aisle, leaving no opportunity for fun unexamined and unconsidered. Typically, he is with his younger brother, Eli, now 3, who does the same thing following the lead of his older and wiser brother.

When Jay finally makes a selection he tries to finagle two from his even older and wiser grandfather, all the time keeping an eye on his younger brother, Eli. Jay has learned that toys are for "sharing" and that once toys reach the playroom floor, ownership is an unenforceable concept—at least for the most part. So, Jay's choice will depend on Eli's choice. There is absolutely no point in getting two of the same thing. Eli's birth has given Jay a shot at two toys and at least one reason to be happy he has a brother.

The first word Jay learned after learning to read and write his name was "free." He, of course, needed to read his name so he could find his lunch. Eli, who is 3, learned to get his name written on things he wanted to assert ownership rights to, like his lunch, but other things as well. He too can read his name but that wasn't nearly as important to him as the fact that Jay could also. Jay learned to read "free" because that is the word that appeared next to the iPad game downloads his father would almost never object to downloading. The ones that cost a buck or two required a little more effort.

So, apply these principles in your actuarial career. Learn why. Learn how. Do better. Life should be an adventure from beginning to end. ☆

Lock in your spot: Keynote speaker Rick Foster, chief actuary for the Centers for Medicare and Medicaid Services. Susan Dentzer, editor-in-chief of *Health Affairs*. Shawn Achor, founder of Good Think Inc. and author of *The Happiness Advantage*. Plus—sessions on a wide variety of topics—complexity science, health care reform, wellness programs and comparative health care systems. And—numerous networking opportunities.

Here's what last year's attendees had to say:

"This is the best meeting for health actuaries."

"My experience with the meeting was very good, principally because of all the leading-edge topics covered."

"The educational sessions were absolutely excellent and right on target with the current topics we are facing in business."

http://HealthSpringMeeting.soa.org.

How Can Actuaries Help the Mortgage Industry?

By Rafik Margaryan

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The 2008 collapse of the housing market pushed the government and banks to develop partnerships directed to stabilize the market and heal the mortgage turmoil. The widely advertised Making Home Affordable program and other foreclosure prevention programs are in fact loan restructuring models ("models") designed to capture and give relief to a specific niche of borrowers: usually people who got into the trouble due to an objective economic, health or other hardship, but who still are "curable" in terms of complying with specific model requirements. The strategic target was to reduce the number of foreclosures, provide extra sustainability and prevent the housing market from future shakedowns. For borrowers the models work as insurance policies (often with zero premiums) against mortgage defaults. In general all current models have strict restrictions in regard to preexisting conditions. According to recent statistics and reports, the models have little effect and are often considered "designed to fail." While it is not clear what was the role (if any) of actuaries in the development and management of the models, a list of improperly managed complex risks comes forth when applying the models.

A major parameter of current restructuring models is borrowers' gross (rarely net) household income. Borrowers are required to show that they meet income requirements and that the income stated is sustainable (e.g., would normally last for at least another year). The models failed to incorporate any job sustainability and security measures. For example, people who have worked on the same job for 10 years and others for one year are treated similarly, while they represent different risks of losing jobs and re-defaults. It is obvious that job security varies from one profession to another and that is not reflected in the models. For example, a health care professional and a freelance artist are treated equally. In fact, the quality of income might be more important than the quantity, and it should be assessed and managed carefully.

Loan to property value (LTV) ratio is another major parameter in the spotlight. It is required to have an LTV not less (sometimes not more) than a predefined level. Probably the logic is as follows: a low LTV means more equity in the underlying property and therefore more bor-

COMMON SENSE SUGGESTS THAT LENDERS CARE ABOUT THEIR PUBLIC RELATIONS AND AN UPCOMING IMAGE OF A VILLAIN LENDER EVICTING A LARGE NUMBER OF PEOPLE TO THE STREETS DOES NOT BENEFIT THEM.

rower assets. More borrower assets mean the borrowers are in less need of help. But a low LTV often means more successful and/or responsible borrowers who are better customers because they managed to knock down their loans more quickly than others. So, when requesting a minimum LTV, the models are promoting an adverse selection.

The consistency of payment history isn't incorporated in the models very well. As a rule, the existing models require a credit check, and the subsequent credit score obtained is used as an input parameter for valuation tests like the net present value (NPV) test of the Treasury. But, if we consider how the determination of the credit score works, it is affected as soon as a borrower misses a payment or is late, which could be the very beginning of the original default. As a result, a borrower with a lower credit score may have a more favorable payment history and hence be more committed to pay back his/her debt than historic nonpayers who recently managed to obtain decent credit scores.

It is not clear how the number of people in households is incorporated into the models. Common sense suggests that lenders care about their public relations and an upcoming image of a villain lender evicting a large number of people to the streets does not benefit them. In other words, the lenders are helping big size households better than small size ones. Big size defines less income per a household member, tighter monthly family budget and a higher possibility of re-default. Plus we know that family size is largely affected not only by income but also cultural and religious factors. Therefore, the relationship between the size of household and sustainability of models is more complex than it would seem to be and has many dimensions. The existing models also do not reflect any highly probable planned developments like graduations, retirements, etc. Such developments could essentially affect one or more control parameters of the models.

A recent forecast states an increase in the number of mortgage defaults and foreclosures in 2011. Loan restructuring is becoming a new branch of service, and, as an emerging field, it is prone to mismanagement and irregularities (and also is attractive to scammers and criminals). The financial and statistical data on loan restructuring practices collected within the last two years could be evaluated by actuaries and become a base for improving the existing models and developing new ones. The need of integration of fundamental actuarial research and modeling in the area of loan restructuring may be vital to the sustainable development of the lending market, present new opportunities for actuaries and also greatly support prevention of the market from future bubbles and downturns. ☆

Benefits of Exam Committee Membership

By Ilan Man

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A funny thing happens when you attend and pass the Fellowship Admissions Course (FAC). On the last day, after the closing remarks are made and everyone is ready to celebrate, the SOA offers an opportunity for newly qualified actuaries to sign up for various exam-related committees. It doesn't take much to see the irony in offering new FSAs, fresh off a grueling multiyear marathon in which their lives revolved predominantly around the exams, an opportunity to extend their relationship with said exams. Granted, in this case you won't be studying pages upon pages of dry actuarial exam material, but by joining an exam committee, you will either write exam questions or grade papers—both of which involve reading syllabus material and dedicating several hours to the process. It should also be noted that this is done on a voluntary basis—you actually have to want to do this.

So why do it? Why join an exam writing or grading committee? When discussing technical, professionally oriented committees, there are several valid and easily apparent reasons for joining. One such reason is that your employer may prefer that you represent your company in an industry-wide capacity, either as a member of a steering committee or as a way to network with potential clients. Another reason could be to learn about topical actuarial issues, such as new financial reporting regulations or sophisticated modeling techniques. The focus of this article, however, will be on reasons to join exam writing and grading committees that I have learned, primarily because I currently participate on both and can share my personal experiences.

HI, I'M ____. AND YOU ARE?

One of the career-building topics that counselors, professionals and popular dogma emphasize is the importance of networking and making connections. The oft-touted cliché, "It's not what you know; it's who you know," is essentially a truism. Regardless of the validity of the comment, there is no doubt that by joining a committee you open yourself up to meeting other actuaries. These are actuaries from different companies, geographies and levels within their respective organizations. For the junior actuary, this is one of the best ways to potentially expand

your professional network. I've met actuaries from all over North America, ranging from those in my peer group all the way through to senior vice president level. I've even met clients, both current and, unknown to me at the time, future, at various committee meetings. The brief encounters that you share at the committee meetings can go a long way and sometimes your professional network doubles in one weekend.

PEEKING BEHIND THE CURTAIN …

It's safe to say that actuaries are generally of an inquisitive nature. We like solving problems, understanding processes and analyzing details at granular levels. This helps explain why we're good at analyzing trends in actual to expected ratios or understanding why the price evolution of equities doesn't follow a smooth curve. It comes as no surprise that, as students, throughout the exam process, we like to question how particular exams came to be. We've all wondered how exam questions are developed, how they are marked, how passing rates are really determined, etc. Participating on an exam writing or grading committee allows you to satisfy that curiosity.

Of course, many are not that curious. After all, participating on a committee is a lot of work just to learn something that you could ask a fellow FSA who is or was a member. But membership means that you're an active participant in the exam process, rather than a spectator. You have an opportunity to impact the types of questions, level of difficulty, exam structure, syllabus coverage, etc. While actuaries predictably bemoan the current exam structure as being easier relative to when they took the exams (senior actuaries never miss an opportunity to remind us how much harder their exam system was), you will be able to speak to the difficulty and appropriateness of the questions. Furthermore, you can voice others' criticisms, along with your own, and attempt to enhance the exam process.

WHERE ARE WE OFF TO NOW?

More superficially, but equally valid, who doesn't enjoy a free trip to a place they may have never been? Spending a weekend in Las Vegas or Orlando (twice), as I did last year, during the winter months of the Northeast, is a welcome break from both routine and weather. Meals are paid for, as are accommodations. If you have some spare time, you can extend your trip for an extra day (or more) and explore the city. It doesn't take much creativity to enjoy some of the fruits of committee membership. Additionally, I've seen firsthand several members participate year after year on the same committees, in large part because they've developed true friendships amongst each other. Considering the multiple trips to warm weather destinations, it's not hard to imagine.

WE'VE ALL WONDERED HOW EXAM QUESTIONS ARE DEVELOPED, HOW THEY ARE MARKED, HOW PASSING RATES ARE REALLY DETERMINED, ETC. PARTICIPATING ON AN EXAM WRITING OR GRADING COMMITTEE ALLOWS YOU TO SATISFY THAT CURIOSITY.

A FOR ALTRUISM?

The SOA has taken years from many of us. Our hair is likely to be graying prematurely and our social lives are years behind where they should be. While exams may not be the sole cause for these phenomena, they surely made things harder. So why, you ask, would anyone volunteer their time and effort to such an organization?

The fact of the matter remains, as long as you're a practicing actuary, the SOA is an organization that you'll be a part of for the rest of your career, and possibly even after that.

With respect to the material covered on the exams, especially at the FSA level, ideally you'd be able to apply the concepts to your daily professional life. Of course, this isn't always the case. Not only are the exams wide in breadth, but certain aspects of the syllabus can only loosely be applied to one's day-to-day duties, which is one of the most hotly debated topics of the exam system. Ignoring this issue, however, the student is exposed to many aspects of the actuarial profession outside of his or

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her role. You may be working in a life insurance valuation role for traditional products, but will be tested on the stochastic pricing process of variable annuities. Or you may be a pricing actuary, but will be required to understand the difference between regulatory and economic capital. The point is that the exams open your eyes to a wide spectrum of possible opportunities within the actuarial world that you may have never considered.

And while only a masochist would repeat the exam process if given another opportunity, I've spoken to several actuaries who share the belief that after having passed the exams, they've learned a lot about themselves. Setting aside technical aptitude, passing the exams while carrying a full course load, workload and/or other personal endeavors, requires a tremendous amount of discipline. Passing the exams requires more than simply understanding the syllabus—you need to know it inside out and backwards. I can truly say that having climbed this mountain, I feel prepared to undertake other seemingly unconquerable tasks. The SOA presented us with a challenge. We overcame it and in the process learned something about ourselves.

Continuing with the altruistic theme, there is also the notion that someone did it for you. Someone volunteered their time to write and grade your exams. I'm sure some students resent those people for making their lives difficult, but once you understand that they aren't doing it to punish you, but rather to maintain a level of rigor within the profession, you'll come to realize that the responsibility lies upon you to maintain that rigor. Put simply: pay it forward.

PROSPECTIVE COMMITTEE MEMBER, MEET THE CYNIC

There are always going to be those cynical people who don't see the value in joining a committee, much less an exam writing/grading committee in which they don't see the obvious ways in which they can benefit. Volunteering generally takes a back seat to one's professional and personal life. More often than not, not having enough time is the main culprit. However, I'd counter that volunteering on exam committees does not take up much time—perhaps a couple of weekends and a handful of hours over the course of a year. It always comes down to a question of priorities. If committees are not important for you, then something will always come up for which you have no time (think about your fitness routine, or lack thereof). If you can see the value in membership, then you'll find the time, rearrange your schedule (for that week or two) and participate. If you don't value it, then by all means don't join and leave that space open for someone who will. The key is for those who are open to joining a committee to not be deterred by those naysayers who don't see potential value of joining.

You must be careful as well, when asking others of their opinion. There are obviously more actuaries who are not

on exam writing/grading committees than there are on the committees. Even the most seasoned actuary's opinion, while no doubt steeped with years of wisdom, should be taken with a grain of salt if they have never participated, especially early on in their careers.

TO JOIN OR NOT TO JOIN?

There are many reasons for not joining an exam committee. By the same token, there are even more reasons for joining. Rather than expound the virtues of the exam writing/grading committees, this article is purely meant to spark your interest. If, at the end of the day, you can see the value in committee membership, you should consider joining. I'm glad I did and will undoubtedly continue to participate, voice my opinion and work to contribute positively to this profession.

The views expressed herein are those of the author and do not necessarily reflect the views of Ernst & Young LLP. ☆

Complexity Sciences—Simplified!

By Dave Snell

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What do deterministic chaos, behavioral economics, fractal geometry and genetic algorithms have in common? Aside from their potentially high scores on a Scrabble board, they are all (arguably) part of the fascinating set of topics some of us have chosen to include under the heading of complexity sciences. Along with other multisyllabic mouthfuls such as predictive modeling, network theory and cellular automata, these topics were discussed in a very popular two-part presentation on complexity science tools at the SOA Annual Meeting in New York City last October.

The Actuary of the Future Section, Forecasting & Futurism Section and the Health Section joined forces to sponsor two sessions: "Complexity Science: What it is and Why You Want to Know about It," which was followed by "Solving Actuarial Problems with Complexity Science."

Why would three sections wish to go in together for two sessions at the Annual Meeting? I think we all saw the potential for a set of tools that may be very useful supplements to our classical set of actuarial forecasting and modeling techniques.

Jennie McGinnis moderated the first session, and I was honored to be the presenter. We covered the ideas behind the names and briefly summarized what they were and how they might be useful to actuaries. Naturally, we did not have time to go into a lot of depth on any one topic in the limited time. For example, Stephen Wolfram wrote a 1,200-page book on cellular automata *(A New Kind of Science)* which he described as an introduction to that topic; and in the first session my presentation on cellular automata was only five minutes long. However, attendee feedback suggests that we did demystify at least the majority of topics and we piqued the interest of many actuaries to pursue further study of them.

A gross oversimplification of the difference between these tools and our more familiar modeling tools would be that classical actuarial models employ deterministic methods, while complexity science tools seem to be more oriented toward inductive methods. For example, actuaries build sophisticated theoretical models and then we assume that the world will conform to them. That may seem to happen for a while and then we are rudely surprised when an outlier event (à la Nassim Taleb, *The Black Swan*) occurs that seems to cascade the tails of our probability curves over one another like a set of dominoes. As Yogi Berra so aptly said, "It's tough to make predictions, especially about the future." He is also known for his comment that "the future ain't what it used to be."

Well friends, the future is not what it used to be; and the tools we used to use to model it may be necessary but not sufficient to continue to model it and manage risk to the degree we as actuaries have thought we could manage it in the past.

I don't know how to squeeze two 90-minute sessions into a newsletter article, but I do have some good news for those who missed the presentations and would like another chance at them. We have been asked to repeat them at the 2011 Life and Annuity Symposium in New Orleans, May 16–17 and at the 2011 Health Meeting in Boston, June 13–15. If you can make it, we would love to be able to spread the word to you.

In the meantime, here is a very simplified explanation of the fancy phrases I mentioned at the beginning of this article:

Deterministic Chaos—many seemingly simple equations and models are highly dependent upon starting assumptions and precision. Even though it has no teeth as we know them, a butterfly effect can bite you. Our session examples included a simple equation of population growth that defies intuition; and a one-notch rating change that sent a $30 billion insurance company into receivership.

Behavioral Economics—human beings are irrational—sometimes predictably so (see Dan Ariely's *Predictably Irrational)*; and they do not always base their financial decisions on logic or self-interest. We showed some examples you can use in your product pricing, your policy applications and in your dating strategies.

Fractal Geometry—we looked back at the Pythagoreans and wonder how they could deny the existence of irrational numbers; or Descartes' later aversion to imaginary numbers; yet we steadfastly cling to Euclid's 2,000-year-old notion that dimensions ought to remain integers. We showed how pervasive the fractional dimensions are, and offered some applications to stock market analysis and to life itself!

Genetic Algorithms—some actuarial problems have no clear deterministic solution, and an exhaustive search is beyond computational capabilities; yet we showed how a very simple set of rules and a technique mimicking evolutionary survival of the fittest can arrive at very practical solutions in real time. The sessions also introduced a sample workbook for attendees to use for learning genetic algorithm programming, and a practical hedging example by Ben Wadsley that his company uses to reduce economic capital requirements.

Predictive Modeling—property and casualty companies have been employing inferential techniques where they learn from the data and win more good cases and, more importantly, lose more bad cases. We showed one company's phenomenal success with automobile insurance and also how Australian police used this technique to catch a serial killer.

Network Theory—we traced some effective tools used to spread a major religion, and showed the strength and the vulnerabilities of the North American power grid, our global airline routes and the Internet.

Cellular Automata—a nonconventional graphic artist used simple rules and the interactions of "boids" to simulate bird flocking even though the physics behind the actions were far too complicated to compute. Current applications include major health company cost measures and a trading model that brought significant advantages to a global bank.

WE SHOWED ONE COMPANY'S PHENOMENAL SUCCESS WITH AUTOMOBILE INSURANCE AND ALSO HOW AUSTRALIAN POLICE USED THIS TECHNIQUE TO CATCH A SERIAL KILLER.

Again, the major point of the sessions are not to make you an expert in any of these new techniques, but to take away some of the hype both for and against their use in actuarial settings and to help you become better informed and excited about new tools and techniques that other scientific disciplines are embracing and using to great advantage. I think the years 2010 and 2011 will be viewed as the tipping point (Malcolm Gladwell, *The Tipping Point*) for actuaries to add these very powerful tools to our tool set. Don't be left behind!

Please check out the following link for further readings about complexity science.

- **Complexity Science** – an introduction (and invitation) for actuaries, by Alan Mills, commissioned by the Health Section *http://www.soa.org/research/research-projects/health/research-complexity-science.aspx* - an excellent way to get started.

- **Complexity:** ***A Guided Tour,*** by Melanie Mitchell is an excellent overview; and also describes the original Robby experiment. I wrote a review of it on Amazon.com.

- At the easy end of the spectrum, ***Complexity, the Emerging Science at the Edge of Order and Chaos*** by M. Mitchell Waldrop, gives a nice history of the

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Santa Fe Institute (SFI). It is less technical than Melanie Mitchell's book; but still a good read.

- ***The Perfect Swarm, the Science of Complexity in Everyday Life***, by Len Fisher, is another easy read and it gives a good picture of the value of networks, and also some behavioral economics.

- ***The Smart Swarm – How Understanding Flocks, Schools, and Colonies Can Make Us Better at Communicating, Decision Making, and Getting Things Done*** by Peter Miller, describes a highly readable set of examples of ant colony optimization techniques and other ways we can learn so much from ants, bees, termites, birds and locusts.

- Also on behavioral economics, ***is Predictably Irrational, the Hidden Forces that Shape our Decisions,*** by Dan Ariely. The MIT test experiment was from Dan's book.

- ***Simply Complexity, a Clear Guide to Complexity Theory,*** by Neil Johnson, gives an excellent example of deterministic chaos and it refutes some commonly held but incorrect views about complexity science.

- ***Complex Adaptive Systems, an Introduction to Computational Models of Social Life,*** by John Miller and Scott Page, gets into more of the details of complex systems. I just purchased it so I can't comment on actual value yet; but scanning through it, it seems good.

- Another interesting book on Behavioral Science is: ***Priceless,*** by William Poundstone. He is also the author of ***Fortune's Formula,*** another favorite of mine.

- ***Linked: The New Science of Networks,*** by Albert-Laszlo Barabasi, gives lots of examples (like the spread of Christianity example) of networks and network theory along with the history of the major developments in it.

- ***Kludge: The Haphazard Construction of the Human Mind,*** by Gary Marcus, makes a great case for evolution and how the human mind, like the body is still quite imperfect and in a state of development for the higher intelligence functions like language and art.

- ***The Origin of Wealth,*** by Eric Beinhocker, is an excellent intellectual history of economics and of the new science of complexity economics. The title is unfortunate. I would have called it The Foundations of Classical Economics – and Why They Were Wrong. The anchoring example is from here.

- ***Agent-Based Models,*** by Nigel Gilbert, is concise; but meaty. I think it is a good read after an overview book such as Melanie Mitchell's Complexity: A Guided Tour.

- ***A New Kind of Science,*** by Stephen Wolfram, is 1200 pages on cellular automata (CA) and probably the seminal work reference for CA studies; but it is a tough read and he is overflowing with hubris so at times he seems a bit over the top. I had to think about it a lot before starting to appreciate it.

- ***Complexity and Chaos,*** by Roger White, is an audio book (www.audible.com) with a good overview and some passages actually spoken by the scientists who made the discoveries (the accents are sometimes hard to follow; but then again, those are the ones that are read by the real scientists).

- Another interesting audio book recently was The ***Nature of Technology***, by Brian Arthur (mostly history of SFI); and still another is ***The Numerati,*** by Stephen Baker (Big Brother is here, and watching us all).

- An old favorite that predates the term complexity science, but helped bring it about, was ***Gödel, Escher, Bach: An Eternal Golden Braid,*** by Douglas Hofstadter. This was the inspiration for Melanie Mitchell to study under Hofstadter and John Holland, a founder of complex adaptive systems.

FREE SOFTWARE

XAOS http://fractalfoundation.org/resources/fractal-software/ Great introduction to Fractals
NetLogo http://ccl.northwestern.edu/netlogo Simple modeling language
StarLogo http://education.mit.edu/starlogo/
Repast Simphony http://repast.sourceforge.net/
Robby –an Excel 2007 Workbook to demonstrate genetic algorithms, from dsnell@rgare.com

Newsletter articles from the Forecasting & Futurism section:
http://www.soa.org/library/newsletters/forecasting-futurism/september/ffn-2009-iss1.pdf
http://www.soa.org/library/newsletters/forecasting-futurism/2010/july/ffn-2010-iss2.pdf ☆

Did You Know?

This article contains a potpourri of facts about the initiatives, activities and projects of the Actuary of the Future (AOF) Section. It is aimed at informing our members of what opportunities are available. If interested in learning more about the AOF, information can be found at http://www.soa.org/professional-interests/actuary-of-the-future/aof-detail.aspx or by contacting us at AOF@soa.org.

Initiatives
The 2011 initiatives for the AOF can be found on the AOF website. Click on the "Projects and Activities" link found in the Resources section.

Newsletter
Current and past editions of the AOF newsletter can be found on the AOF website. Click on "Past Issues" found in the Publications section.

Younger Actuaries Network
The Younger Actuaries Network started in January 2006. Its mission is "to encourage the professional, academic and social development of 'early career' actuaries in addition to providing all actuaries with a greater sense of community throughout the Society."

Pulse Survey Contest
Thanks to all who participated in our pulse survey last October! Congratulations to our members who won a $100 Visa gift card: Christopher Marco, Michael McDermid and Stephen Peeples.

Section Council Intern
Karan Phadke is our section council Intern (SCI). The SCI program is in its first year and is meant to add the perspective of pre-ASAs or students to our section council. If interested in more information about the SCI role, contact us at *AOF@soa.org* or Karan at *karan.phadke@utoronto.ca.* Look for notices and e-mails later this year as we look for next year's intern.

Section Council
Each council member holds a three-year position. Becoming a section council member is a great way to network with fellow actuaries from different companies and/or countries as well as keeping up-to-date on the latest actuarial trends. These positions require at least one hour per month for the section council call. If you're interested in becoming a candidate for one of the council member positions up for election this year, contact us at *AOF@soa.org.*

Life & Annuity Symposium
The AOF is sponsoring/cosponsoring the following sessions at the upcoming
Life & Annuity Symposium—May 16–17, 2011:

- Complexity Science: What it is and Why You Want to Know About it—cosponsored with Forecasting & Futurism (F&F) and Health
- How to Become a More Influential Leader—cosponsored with Management & Personal Development (MPD) and Entrepreneurial Actuaries (EAS)
- Solving Actuarial Problems with Complexity Science—cosponsored with F&F and Health
- Uncover Your Unique Value Proposition—cosponsored with MPD and EAS
- Speed Networking for Business Success—cosponsored with MPD and EAS
- Understanding the ABCs of the ABCD Board—cosponsored with EAS.

More information can be found at *www.soa.org/las.*

CONTACT US
Comments and suggestions are always welcome and can be sent to any council member listed on our website or to *AOF@soa.org.*

How I Passed My Final SOA Exam

Study Tips for Conquering FSA-Level Exams

By Michael McDermid

They say that by the time you figure out how to pass the fellowship-level exams, you're done. And how true that is! In this article, I am going to share a few exam tricks that I've picked up along the way with the hopes that they can help other actuaries prepare for the daunting journey to fellowship. And, with the need to constantly learn new concepts over your career (thank you CPD!), hopefully some of these tips will be useful for actuaries even after obtaining their FSA.

OVERVIEW

Like most actuaries, I was pretty good at math in high school and university. I was also quite successful with the preliminary actuarial exams, even though I found them challenging. But when I started in on the fellowship-level exams, something happened … they were a lot harder to pass!

I've had the pleasure of working with some fantastic actuaries who have collectively given me some great advice on what I needed to do to pass the exams. Below is a list of tips that I have accumulated from other actuaries, students, and through my own trial and error.

IT'S THE THOUGHT THAT COUNTS (CONVINCE YOURSELF YOU WILL PASS)

With the sheer volume of material, and pass percentages set where the majority fail, inevitably you will have moments where you want to throw in the towel. When those moments come, my advice is to take a few minutes and remind yourself of all the hard work you have done and will continue to do. You have to be confident that you will pass the exam.

Remind yourself that everyone else had to go through the same syllabus as you and that you are putting in the effort to pass. Reflect back to the feelings you had upon passing the preliminary exams and think about how great it will feel when you pass the fellowship-level ones.

Committing months of your time to studying is not fun. Everyone has family/work commitments. And while it may feel like the days are flying by in the blink of an eye, these exams can be passed. In a recent presentation to a group of university students, a fellow AoF council member stressed the dedication required to pass these exams. There is no substitute for hard work, a positive attitude and a commitment to passing the exam.

NOT NOW, BUT RIGHT NOW! (START EARLY)

People always ask how many hours they should put in to pass. While I've heard the rules of thumb (100 hours per hour of exam, three times as many home study hours as work study hours), I think the amount of time required is entirely a personal decision. I like to tell people you need to put in as many hours as it takes to pass the exams. (An extremely useful comment, I know!) Everyone is different, and every exam is different. You need to put in enough time to know the material cold come exam day.

The best advice, though, is to start early. You've probably heard this point before, but it really can't be overstated. You must start early.

I was once told by a former boss that in order to finish on time, you have to start on time. So, when determining when to start, work backwards. How many passes through the material do you want to do? (two, three, more?) How long will each pass take? How much time do you want to have at the end to dedicate to old exams? What about memorizing flashcards? And don't forget about family/work commitments. (You've got to hate it when life gets in the way.) Figure out what you want to put in, and work backwards from the exam date.

It's also good to factor in a few breaks in your study schedule. Another former boss indicated that she knew she needed a week away from the books with about two months left to let herself recharge for the final push; otherwise, she would be burnt out come exam day. So, she factored this into her study schedule. Knowing what works best for you (and being honest with yourself) is critical when setting up your study schedule.

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TO READ OR NOT TO READ, THAT IS THE QUESTION (PASSES THROUGH THE MATERIAL)

When it comes to the 2,500-ish pages of source material, a lot of people question whether they should read it all or not. My advice is, assuming you have read the above and started early, to quickly read the source material for your first pass. Don't try to memorize it or even understand it all, just give it a quick skim to get a sense of what's on the syllabus (and try not to get too depressed!). Another tip I have on the first pass is to identify where all the examples in the source material are located. When setting questions for an exam, what would be more appropriate (or easier) than taking an example from the book and changing a few numbers? Even though I've questioned it a few times, question writers are human too.

In recent years, technology (and entrepreneurial actuaries) has made it possible to have online seminars. Online seminars condense the entire syllabus into 40 or so hours of podcast-style videos, breaking the syllabus into multiple sections. Online seminars give all the benefits of classroom style lectures with the added bonuses of being able to view them multiple times, on your own time, and from any location. For a second pass, I would definitely recommend going though an online seminar to get a flavor for how everything fits together. Again, you may not want to get into the nitty-gritty details of memorizing lists, but rather get a feel for where you will need to focus your time later.

(Note: I will not recommend any one particular guide; if you're not sure which one to get, and money is not an option, get them all! If money is an option, ask people to describe to you the various guides out there so you can make the best choice for yourself. Remember what worked well for someone else may not work well for you.)

For a third pass, I would recommend the tried-and-true study manual. At this point you want to commit to not only understanding the material, but also think about how the material could be tested. Going back and redoing all of the exercises from the source material would be a great way to cement the concepts through possible exam questions.

(Again, I won't recommend any particular manual. However, it could be an advantage to get a different company's manual vs. the seminar. This would give you a slightly different perspective and emphasis on the material.)

I would then recommend a fourth pass by condensing the study manual down to a manageable piece to memorize, but more on that later.

THE HIGHLIGHTER TRICK

Okay, this is going to sound really stupid. In fact, when it was first described to me, the woman telling me about it started with "This is going to sound really stupid … but it works!"

For the highlighter trick, the first step is to get as many different colored highlighters as possible. (and lots of them!) Next, when going through your study guide, use a different color to highlight different topics. For example, I used green for chapter titles, yellow for subtitles, blue for any list, purple for all formulas and pink for any other noteworthy points. And be consistent (i.e. don't change up the coloring mid way through the manual).

Why the highlighter trick works:
It forces you to slow down. How often have you read something only to have to reread it a few minutes later because you weren't really reading it? (For example, that last sentence.) This material is complex enough that when reading through your study manual you have to take the time to actually read it and not just skim through it. This trick forces you to slow down, if only to grab a different color when highlighting.

It keeps you focused on what you're reading. By using different colors, you are always thinking about what you're reading. Is it a list, a formula, or just a bunch of titles? Furthermore, if I did get distracted (or more appropriately, when I got distracted), I could quickly get back to being engaged by looking for the chapter title (green), and subtitle (yellow).

It's a great sense of accomplishment. Nothing is less satisfying than realizing it took three hours to read through 30 pages of a study guide and you have nothing else to show for it except a few notes in the margin. Not only will the pretty colors keep you engaged, but you'll actually feel like you've accomplished something with your time. To pass this exam, I needed to win a lot of little battles along the way.

When doing your second (third, fourth, …) review, you can quickly grasp an overall view of the chapter in a few seconds. Is the chapter mostly blue (i.e. lists), or is there a lot of purple (formulas)? A chapter that was mostly yellow (subtitles) was one that I knew I could gloss over while one that was mostly pink (noteworthy points) was worth extra attention.

Now, the highlighter trick isn't for everyone. In discussing this with a coworker, he indicated that this trick would not have worked for him because he would have just cruised through the readings, highlighting the lists, definitions, formulas, etc., without actually reading them. The only way for him to "slow it down" and absorb the material was to rewrite the entire manual in his own notes. The takeaway here is to take your time and use what works for you to understand and absorb as much of the material as possible.

I definitely credit the highlighter trick to keeping me engaged through the months of preparing for this exam.

FLASHCARDS

This is going to sound extremely blasphemous: I did not use flashcards when studying for this exam. (I feel like I'm on the A&E show "Intervention".) In past attempts, when using flashcards I found that I was memorizing the lists but not the questions. (Rarely would the exam question ask "What is the 10th flashcard from the blue section?") Also, I found I was focusing too much time on a lot of minor points and not on the high-level big picture or various cross references. It was hard for me to put it all together just memorizing the flashcards.

Now, there are some people who can memorize a stack of 500 flashcards and tell you every subpoint on each of them; I am not one of those people. So rather than study for this exam by trying to memorize an arm's length of flashcards, I needed an alternative solution: I made my own question sheets. I would write a generic question or theme on the top of a letter- sized sheet (much like you would have on the exam) and wrote out all lists, formulas and points related to that theme. I found this helpful as it not only forced me to write out all the lists, but it also forced me to cross-reference different pieces together.

Some people suggest dedicating the last three to four weeks of your study schedule to memorizing flashcards.

By writing out and memorizing 10 sample questions a day, I had a database of over 200 sample questions to draw upon come exam day. Realizing you wrote out and memorized the answer to an exam question a few days before the exam is a huge pickup during the 15-minute read-through.

This exercise is also useful if you're not sure exactly what the question is asking. During the exam, I found myself thinking back to my own question sheets regarding which list or formula to use to answer the question.

A final point, by organizing the various points onto a single sheet, it made for a very organized answer on the exam. I knew exactly how I wanted to answer a few of the questions. Making the answer as straightforward as possible shows the marker that you knew exactly what and how you wanted to answer the question.

MISERY LOVES COMPANY (STUDY GROUPS)

For my last exam, there were four of us taking the same exam at my then employer. So, we decided to form a study group and met once a week to discuss certain topics related to the exam.

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OLD EXAMS ARE A GREAT REFERENCE TO HELP PREPARE YOU FOR EXAM DAY. HOWEVER, WHEN GOING THROUGH OLD EXAMS, I DIDN'T SIT DOWN AND SIMPLY GO THROUGH LAST YEAR'S EXAM …

In a study group, you can assign a piece of a section to each member of the group and have that person lead the discussion: important takeaways, possible questions, old exam questions. A study group also allows you to work through the tough problems together, rather than spinning your wheels on your own.

Another thing that I got out of the study group was the chance to bounce ideas off of other people. Do you think this material is important? How do you think they could test it? I think of the material this way; how do you look at it? How does this paper tie into the other papers in the section, or the syllabus in general? Why do you think they included this paper in the syllabus?

Also, by joining a study group I was pushed to keep to my schedule. In past attempts, there were always excuses to postpone studying with the thought of "I'll make it up tomorrow." For a study group, other people were counting on me to be prepared and I was counting on them. If we were to meet the next day to discuss a particular section, I made sure that I was ready to discuss; no excuses.

Finally, you may find it helpful to recruit a few educated actuaries to aid your study group. A colleague of mine stressed that for her study group, having subject matter experts on hand was definitely beneficial for topics that the group couldn't quite figure out on their own or where they wanted a more in depth understanding. A lot of FSAs have a great deal of experience and knowledge that they can share and may be particularly good at explaining certain subjects. Breaking the topic down into simple terms or walking through examples can really help clarify things. In addition, just having these enhanced discussions often helps solidify things in your memory.

When joining a study group, I encourage people to be an active member; you get out what you put in. Don't just sit back and let others lead the group. Remember, your success on exam day is not inversely proportional to your study group mates'; in fact, the opposite is probably true.

I personally got a lot out of the study group and know that my fellow study mates did as well. In fact, this was the second time that I was part of a study group for an actuarial exam and I can say I am officially two for two!

HISTORY REPEATS ITSELF (OLD EXAMS)

Old exams are a great reference to help prepare you for exam day. However, when going through old exams, I didn't sit down and simply go through last year's exam, and then the exam from two years ago, and then the exam from three years ago,…

Instead, I went through the syllabus and came up with 13 different categories, and then read through all the old exams and bucketed the questions into the various categories. (For most of the smaller sections in the syllabus, I grouped all questions into the same category; for the larger ones, I split the questions into different categories.) Obviously, some questions can pertain to more than one category, so I assigned them accordingly.

Then when it was time for me to go through the old exam questions, rather than go through them in the order of the exams, I focused on all questions pertaining to each category separately. How have they asked questions from this category in the past? Is there any study note that gets more or less attention than the others for this category? Are there any discernable patterns in the questions? What's overdue to be asked?

This also gave me the opportunity to study how the exams had been constructed. For example, for my exam I noticed that in the past they tended to pick a particular category and asked a lot of questions about it and how it relates to other categories (i.e. one main topic with a lot of questions containing cross references to other topics). So, when I realized they had asked a few too many questions pertaining to a particular category in the morning session, rather than ignore it during my lunch review (thinking "Well, they've already asked a few questions on that."), I did the opposite and focused on it! Sure enough, there were a few more questions in the afternoon cross referencing that category.

Another key point I'd like to make about old exams is to study the sample answer. In past attempts, I was too focused on my answer and not the sample answer provided by the graders. There is definitely a lot to learn from

the sample answers. For example, what is the difference between a 10-point answer and a three-point answer? What is the difference between "list", "describe" and "explain"? How much detail are they expecting for a calculation-type question?

Finally, I caution you to not fall into the trap of trying to guess the exam and limiting your preparations to what you think will be tested. Just because a topic was asked last year doesn't mean it won't be asked this year. While it is reasonable to make rough guesses about what questions may appear on the exam, anything can happen. A similar type of question can repeat after one year, after two years, or never again.

TREATING EVERY DAY LIKE EXAM DAY

Most of us have a certain time of day that we feel the most productive. For me, I'm a night owl; I do my best studying after most people are sound asleep! When studying, I would often be up at 2:00 (or 3:00, or 4:00) AM, and then sleep in until noon the next day.

Unfortunately, the exam doesn't start at noon; it starts at 8:30 a.m. And factoring in travel time (and the need to be unbelievably early), I was getting up a lot earlier than I would like.

For the final week of studying, my advice is to treat everyday like it's the exam day. Get up at the same time, eat breakfast, get ready, and factor in travel time like you would on the day of the exam. For those of us who are night owls, the first few days will be rough, but it's better to have a rough morning five days before the exam, than on exam day.

Then, for that last week, start your three-hour "exam" (as you will on exam day) at 8:30 a.m. What I mean by that is sit down and have a study session for three hours straight; no distractions. When studying in past attempts, I was constantly getting up for one thing or another (can you say ADHD), and hadn't actually sat down for three hours straight until the day of the exam. After the three hours is up, treat yourself to a break (just like on exam day), but plan to come back to it for another three-hour session in the afternoon.

The reason I suggest this is that it helps to prepare for how physically exhausting writing these exams can be. Altogether you are probably looking at a 12-hour day, with your emotions all over the map. You need to prepare for this so that come exam day you don't find yourself so exhausted following the morning session that you couldn't care less about the afternoon session!

Another great piece of advice I got related to the last week of studying was to work in an hour of exercise a day. Nothing too strenuous of course (walk around the neighborhood, swim at the local pool); just enough to get your blood pumping, head clear and work out some of the extra tension. If you're reading this and thinking, "There is no way I can take an hour off the day before my exam," you don't have to. Grab your iPod with some lists on it and just listen as you work out.

Finally, I would like to share some advice I got from my second year algebra professor on preparing for exams: "Study what you know; don't study what you don't know." What she meant by this was be sure to not overlook the easy material at the expense of the harder material when cramming for an exam. The questions on the exam are quite thorough across the entire syllabus. In past attempts, I was always trying to learn something new a few days before the exam, when perhaps my time would have been better spent review the material I was already comfortable with. The goal isn't to learn everything on the syllabus; it is to pass the exam.

TIME IS NOT ON YOUR SIDE, NO IT'S NOT (DURING THE EXAM)

A few tips on what to do during the fastest six hours of your life:

1. Come up with a strategy to use during the exam. A friend of mine would go through the exam and try to answer all of the calculation-type questions first (it seems that usually half of the exam is calculation-type questions, while the other half is list/recommendation-type questions). This played to his strength of being extremely quick with the technical questions and gave him plenty of time to focus on the "wordy" questions.

2. My strategy was to go through the exam and quickly write down all high-level lists and formulas for all of the questions and then to go back and repetitively go through the exam. I would address the "easy"

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questions first and leave the "hard" questions till the end. Again, come up with a game plan that works for you. Use each of the 15-minute read throughs to your advantage by formalizing your plan for the next three hours.

3. Make it as easy as possible for the graders (and yourself). Bullet point answers, writing as big and legibly as possible, and showing all steps in your calculations are great pieces of advice to convince the grader you know what you're writing about. You want to make it as easy as possible for the grader to mark your paper.

4. They indicate that you are to start each new question on a different piece of paper. I prefer to start each subquestion on a fresh sheet as well. There is plenty of paper available—use it.

5. Avoid the dreaded zero by answering every question. For example, on my exam there was a question where I wasn't sure which of two lists they wanted. Rather than guess, I quickly jotted down the high points for both lists. Now, I didn't have time to get into all the subpoints for both and can guarantee that I wasn't going to score a 10 on that particular question, but I ensured myself that I got some points for it. While a "brain dump" is not ideal, if you are not sure what to put for a particular question, you may want to do the following: define any/all terms, list out all formulas, or describe certain components (e.g. products, regulations, methodologies) contained within the question.

6. Do not allow yourself to fall into the trap of spending too much time on any one question. On my last exam, there was a three-point question on controls which is a topic that I deal with everyday. Realizing that it was only worth three points, I stopped after spending the allotted nine minutes, even though I could have written a lot more. Now, in that nine minutes I was able to fill up three pieces of paper and I got all of the major points across, but needed to stop and move on to other questions.

7. Another example on my exam was for a particular question that I had gotten down to three equations with three unknowns to solve for a piece needed for the final answer. Now, I am a few too many years removed from first year linear algebra to quickly solve that question. Recognizing that the intent of the question probably wasn't calculating the inverse of a matrix, I quickly wrote: "Use linear algebra to solve for X. Plug X into formula at top to solve for Y. Ran out of time. Assume X = 10". I then used X equals 10 to solve for the piece they were asking for. (I really wanted to write: "At this point, I would hand it over to the co-op student to solve," but I didn't know what sense of humor the marker would have.) I probably didn't earn full marks, but by saving the minute or so (or 5 or 10) to answer a less critical piece of the question, I was able to move on to other questions to earn more points.

8. Remember you don't have to score a 10 on every question to pass. You don't even have to pass every question to get a passing score on the exam. The end goal is to pass the exam. My advice is to keep that in mind when studying for and writing the exam.

CONCLUSION

They say it's how you feel going into the exam, not coming out. Going in well prepared by having put in the time, confident that you know the material, and ready to peak is the best that you can do to be successful on exam day.

Please note that what worked for me may not work for you, and I encourage everyone to develop their own process for preparing for the exams. You may find it helpful to use different learning tools and methods: reading, watching videos, discussing with a group, doing problems and examples, writing old exams, putting together your own notes, quizzing others, talking with actuaries. Find out what works for you and do it.

Good luck and happy studying! ☆

A Candidate's Considerations on the Profession's Future

By Talia Pankewycz

The actuarial profession will be different in the future; that we know for certain. Exactly how it will evolve is trickier to determine, though I have a few ideas about the future of the ASA and CERA designations, the SOA education system and public policy.

ASA

One possible change for actuarial students could be the development of more paths to the ASA designation. As you may know, this was a controversial discussion within the North American actuarial profession last year. While I am writing solely to share my opinion, I encourage the North American profession to continue discussions on this topic.

CERA

The development of the CERA designation heralds the beginning of more new roles and tracks for future actuaries. The CERA credential itself, along with the enterprise risk management (ERM; currently Finance/ERM) specialty track, will become more popular; the addition of new tracks as the profession evolves is also a possibility. To learn more about changes to the CERA pathway and expansion of ERM learning opportunities in all tracks for candidates pursuing fellowship, go to http://www.soa.org/education/general-info/edu-pathway-changes.aspx.

The greater emphasis on ERM as an initiative will open more doors for actuaries in nontraditional roles and fields. We will be uniquely qualified to manage risk not only in insurance companies and other financial organizations, but also in other corporations and the public sector as well. With the development of new and more complex financial instruments, actuarial expertise will be in high demand.

EXPANDED LEARNING

Furthermore, there will be a movement to more online and virtual learning. This movement has already started; it can be found in webinars for continuing professional development (CPD) and the modules in the exam process. This "virtual-ness" will also extend to day-to-day activities as actuaries are expected more and more to interact with coworkers in other departments, fields, and especially other parts of the world. No longer will an actuary be expected to sit at a desk all day looking at spreadsheets; we are now part of a global society. The future will require us to discover innovative ways to connect. It is becoming increasingly important that actuaries find a balance between the "soft" skills (such as communication) with our technical skills

PUBLIC POLICY

Changes in the day-to-day activities of actuaries will also be driven by policy changes. This is something we are watching happen before our eyes with both American health care reform—which will undoubtedly and irreversibly alter the landscape of group benefits insurance—and upcoming worldwide changes to financial regulations that will certainly have a large impact on many of the companies that employ actuaries. Public policy is the largest wild card in the future actuarial landscape, and the one that we have the least control over. Only time will tell.

CONCLUSION

The actuarial profession will change in the coming years, if only to keep pace with our rapidly changing world. And while these changes are unpredictable and beyond our control, I have no doubt actuaries will continue to play an integral role in that world. After all, risk is opportunity. ☆

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The Risk Manager of the Future

By Karan Phadke

Karan Phadke is an actuarial mathematics student at the University of Toronto. He can be reached at karan.phadke@utoronto.ca.

Whether it regards daily work or momentous career decisions, "Where are we headed?" is a question that is, in some form, asked by everyone in the actuarial field. In fact, even the credentialing process offered by the SOA has an element of prediction embedded in it. The array of tracks available on the path to fellowship requires students to make a bold decision on both the profession and their own future. When it comes to actually trying to answer this question, though, it is best to first carefully examine the past.

Historically, actuaries have worked in insurance (life, health, property & casualty) and benefits consulting. A quick glance at the industry today shows that while there is now a greater dispersion amongst banks and government, the overwhelming majority of actuarial talent remains within the historical hemispheres.

Upon further inspection of the "traditional" roles, there are three salient points that will most likely affect trends in actuarial employment.

The first is the impact of health care reform in the United States. This has temporarily created further demand for health actuaries and may well allow for even greater opportunities past 2014.

Second is the ever-increasing emphasis on enterprise risk management (ERM) within the insurance industry. The importance and size of risk departments will continue to increase as products with more market risks are developed. The swathes of actuaries in corporate risk roles in recent years are testament to this push into riskier, higher margin products.

The final point to consider is the slowdown in defined benefit retirement work and the corresponding decline in demand for actuarial expertise in this area. Perhaps this is a boon in disguise for life insurance companies in the individual annuity business? The decline in demand is forcing actuaries working in this sector to evaluate how to use their skills in other ways.

It can therefore be seen that even the historical tracks are fertile with opportunities. The financial crisis, however, has made it clear that there is an even greater need for highly competent risk professionals on the asset side of finance (and in a capacity reaching beyond asset/liabil-

ity management). The capital markets, investment and financial derivatives world, which has been dominated by "quants," could greatly benefit from the actuarial touch.

The competencies of the actuary, from managing contingencies and ERM to predictive modelling, are perfectly suited for the noninsurance world. Indeed, the thorough statistical methods that actuaries regularly encounter can be used to better control risk at oil/gas giants, green technology start-ups or even in manufacturing and inventory control systems.

So where were the actuaries at BP or Bear Stearns?

Is it possible that the lure of higher pay in historical roles is what continues to keep actuarial talent pigeonholed? After all, who would want to take a pay cut and go work in a new arena with no rigorous actuarial processes or framework? Then again, who wouldn't want to be the first to "pave the way" in a new area, thus creating a new path for future actuaries?

Getting actuarial practices widely recognized is no easy task. The solution lies in getting more actuarially trained professionals to work in nontraditional positions. The major obstacles in achieving this seem to be travel time and wage differentials, in addition to convincing companies in nontraditional sectors that they need actuaries to help manage their risk.

Although a low supply of actuaries might help maintain wage levels, it also means that students are essentially forced to walk the well-worn path in search of a larger salary. The daunting travel time also forces many talented individuals to seek other types of credentials in finance or even abandon their current exam attempts.

In my opinion, the introduction of "CERA-like" designations is a positive step forward. Perhaps credentials without a heavy emphasis on life contingencies and insurance would encourage more risk professionals to learn actuarial concepts and then apply this knowledge in other areas of expertise. It seems to be clear within our community that there is a need for prudent actuarial thinking outside of historical roles—the challenge is to get the rest of the world to see this too.

In conclusion, it is clear that there are numerous obstacles that the profession and the future actuary will have to overcome. Yet, one thing remains clear. Actuaries are arguably better at analyzing and interpreting risk than any other professional. The exhaustive exams teach us how to manage risk, not eliminate it. If the profession is to continue to flourish, it will be vital to take this idea and apply it to one's career too. After all, risk is opportunity. ☆

Actuary of the Future Webcasts!

Recapping our 2010 Webcasts and Discussing our Plan for 2011

By Michael McDermid

Michael McDermid, FSA, MAAA is director of valuation process & controls with John Hancock Life Insurance. He can be reached at Michael_McDermid@jhancock.com.

About a year ago, Mark Yu (2010 AoF Council Chair) contacted me after I indicated a desire to volunteer with the AoF Section. Mark asked me how I would like to assist and I indicated an interest in helping with training/webcasts. Over the past year, I have had the pleasure of working with the AoF to plan two webcasts aimed at our section members' development needs. The following is a summary of the two webcasts sponsored by AoF in 2010, along with a few thoughts regarding our plans for 2011.

MAKING THE TRANSITION: FROM ANALYST TO MANAGER

Our first webcast of the year was held on Aug. 17, 2010 and addressed the topic of transitioning from an actuarial analyst to a manager. It was a success, with 71 sites registered!

Two amazing presenters, with very different backgrounds, shared their stories. Our first presenter was Dave Dickson. Dave is an active member of the SOA, AAA and CIA, and spent most of his career working for the Independent Order of Foresters. Dave discussed various topics including skills required to be a successful actuary, management skills and career management. Our second speaker was Chad Runchey. Chad is manager in the New York office of Ernst & Young, and followed with considerations for consulting actuaries. Some subtopics Chad addressed included growing client relationships, developing your personal brand and generating business.

After the formal presentation, we really delved into the topic through an interactive Q&A session. Serving as the moderator for the webcast, I was definitely intrigued by the high-level questions submitted by the audience. Based on these questions and the comments in the post-webcast survey, this topic was spot on for our section.

HOW TO CONTROL YOUR CONTROLS

Wanting to tackle a more technical topic, our second webcast discussed actuarial controls. Held on Dec. 16, 2010, this was truly an all-AoF affair as the three presenters and moderator are all AoF section council members. I had the pleasure of being the first speaker and discussed the definition of a control and the purpose controls serve. Ashwini Vaidya then discussed why controls are important. Finally, Dave Snell (AoF Council Vice-Chair) addressed how to have effective controls. Following the formal part of the presentation, we had a spirited Q&A session led by the webcast moderator Jennie McGinnis (AoF Council Chair). With 43 sites in attendance, this was another successful webcast!

LOOKING AHEAD TO 2011

For 2011, we are also planning two webcasts, and want to keep one focused on career development, and the other on a technical topic. While still in the preliminary stages (please note that I'm writing this while the Leafs still have a chance to make the playoffs!—or late February for you non-hockey fans), we wanted to share with you our plans for 2011.

Wanting to build off the success of the "Making the Transition" webcast, we are looking at a summer 2011 webcast on how to be an effective boss. In this webcast, we hope to dive into subtopics such as having an impact on your organization, becoming a creative problem solver and what you can do to manage the perception others have of you.

For our second webcast of the year, we are looking at a potential late fall 2011 webcast on behavioral economics. With this webcast, we hope to address methods of predicting human behavior in response to emerging conditions.

Again, please note these may be subject to change. Naturally, if you have any suggestions for topics/speakers, please do not hesitate to let us know; you can reach us at aof@soa.org.

Thank You!

Finally, AoF would like to formally thank the SOA for all their hard work in bringing these webcasts to life. There is a lot of behind the scenes work performed, discussions with the section council on dates/topics, coordinating with speakers, discussions with the vendor, etc. In particular, Amy Wojcik was instrumental in ensuring the success of both of our 2010 webcasts. Thank you for all your help and we look forward to working with you in 2011! ☆

So … You Want to Change Careers and Be an Actuary? Really? Really?!

By Jason Bribitzer-Stull

Jason Bribitzer-Stull, ASA, is an actuarial analyst/consultant with Towers Watson. He has former careers as a classical musician and cook as well as marketer and salesperson. He's more than happy to answer questions on making a career shift into the actuarial field and can be reached at jason.bribitzer-stull@towerswatson.com.

What does a typical actuarial student look like? If you asked most people they'd describe this person as a recent college graduate with a degree in mathematics or actuarial science—someone who is just starting out their career and looking to develop work skills at the same time that they educate themselves with exams. Being an actuarial student is hard work too. You end up working a full time job plus a part-time job of studying for exams. Needless to say, it's easy to categorize the rigors of starting an actuarial career as something for the young.

So, what does an (older) mathematically inclined person do when they find themselves without a job at the beginning of the financial crisis? Someone who doesn't necessarily fit the stereotypical image of an actuarial student? If they, like me, decide that being an actuary fits what they want to do with their life, they look at a serious career shift and start over.

I was 35 when I took my first actuarial exam. When I've mentioned this to some of the senior people in my office, they just shake their heads and think I'm crazy. Exams are a rough time for people, and all of them had moved on to other stages of their life by their mid-30s. For a lot of people in the field they're already at a senior level by this age. They have significant experience in their chosen industry and are significant contributors; exams are for the youngsters.

But, with a large number of people out of work and needing to retool their skills, I know I'm not going to be the only nontraditional, older, previously experienced person out there who decides to make the career shift to become an actuarial student. It's a big commitment and it's not easy, but making the career change to being an actuary can happen later in life and be very rewarding. So—three years into this new career, I thought I'd share some kernels of insight and knowledge to anyone thinking of making this big (insane?) of a change.

- **You have to have the math skills.** This isn't a career shift that's taken lightly. The exams are hard—grueling even at times. I had a minor in mathematics

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in college and always had the quantitative skills, so it made it easier for me, but I've still spent hours studying to get myself back to the level I was at 15 years ago.

- **You're starting over**—somewhat. I had 10+ years of experience in marketing and sales positions before this shift. I have a lot of skills that are very valuable to a business, but when I was hired on it was in an entry-level actuarial analyst position. I've been able to leverage those additional work skills on projects and in the office, but right now my main contribution to the team is as an analyst—just like someone else with three years of work. I know that when I finish up exams, I'll be further with this new career because of my previous experience, but, until then, I'm still crunching numbers.

- **Swallow a bit of your pride.** Your boss/supervisor/team member is going to be younger than you—and probably smarter. I have met some incredibly intelligent and talented people in this profession. But there are times when I just feel old—and dumb. I stop, swallow my "but I'm older than you" reaction, and realize that there's a lot I can learn from the people around me.

- **Say goodbye to your social life.** One of the hardest shifts for me was going from a life with lots of time to spend with my spouse and friends to giving up evenings and weekends to study. It's not easy to see everyone else living their lives after establishing their careers, but I remember that it's worth it in the end. The life of an actuary is very rewarding, and I'm beginning to see some of those rewards as I move forward. Which brings me to …

- **Keep your eye on the goal.** A shift into the actuarial field is a four- to seven-year commitment for exams and requirements depending on how fast you progress through the system. But the end goal is worth it! I wholeheartedly agree that this field is one of the most rewarding—both in the kinds of business problems we solve, but also personally in terms of remuneration and eventual quality of life. As a friend told me when I made the shift, "You mortgage a part of your life [for him, he was in his late 20s, for me, I was in my late 30s], but it's worth it in the end."

I feel like I've been a good actuary since I made this shift. I know I've succeeded in this career like I haven't before, and I've been able to bring my other life experiences to the job in ways I wouldn't have expected. I'm pretty sure my bosses are happy that they hired me as well. I know that my success has opened up the door to other nontraditional hires in the office, and the skills they've brought from previous careers have just added to our overall success. So, if you're a hiring manager, think about what you can bring into your organization by hiring someone from a different career. Even if they don't look like your stereotypical actuarial student, it can work out well for everyone.

And, if you REALLY want to change careers and be an actuary, then okay—go for it. But know that the great rewards come with a lot of work. Now, if you'll excuse me, I'm going to go do some more studying. ☆

How Volunteering Helped an Actuarial Student

By Kate Lishego

While I was in school, I was one of those people who always signed up for everything. I needed to frequently connect with different types of people. Getting involved in various organizations was the logical way to do this. College was no different since there was an endless supply of organizations to join on campus. Any interest that one could possibly have would also have a corresponding club to join. Graduating college and moving to a city that I had never even been to was a bit of a culture shock. Now time was filled with just working, studying and hanging out with friends on the weekend.

Eventually I realized that something was missing. I did not see myself moving toward becoming the "Actuary of the Future" that I knew I wanted to be. Sure, I was passing exams, but that wasn't enough. I decided to look to a few different places for new opportunities: my company's volunteer program, Toastmasters International and the Actuary of the Future (AOF) Section. All three organizations provided experiences that helped with the soft skills that every actuary needs: communication, networking, teamwork and leadership.

COMMUNICATION

Communication is undoubtedly one of the most important skills an actuary can have. Anything that one completes for work will need to be communicated to someone else. Since Toastmasters International is a club for improving one's public-speaking skills, it was an obvious organization for me to sign up for. While working toward completing the first 10 speeches, you become better at presenting with each one. You become more confident and learn ways to more effectively communicate. These skills will help me in my career as I need to explain results to actuarial and non-actuarial colleagues.

NETWORKING

Networking is another key skill that people may tend to forget about. While networking with other actuaries is necessary, networking within and outside your company are equally important. By signing up for events through my company's volunteer program, I was able to meet people from other areas throughout the company. Examples of events include serving dinner at a shelter and working at a holiday party for the local senior center, as well as preparing meals for people with family members in the hospital. Through all of these events I was able to meet other people and get to know them while we were volunteering together. Through networking I have been able to build relationships with people within and external to my company. Such relationships help me create contacts when I need help, whether it be explaining a function of my company that I don't know (such as the claims department) or helping me see a situation from another person's perspective.

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TEAMWORK

Many actuaries work in teams on a daily basis—working with their managers, other actuaries or people from other departments. Being able to work effectively in a team will help an actuary in any role. Through my company I signed up to run a relay race where each of the four team members had to run 8.6 miles. While the other three members on my team had run marathons in the past year, I had not participated in a race since high school. As a result, I had to train for a few months beforehand, and it paid off because our team finished the race with a bronze medal. Teamwork creates a sense of responsibility of not letting team members down and that it requires everyone to make an effort.

LEADERSHIP

Since many actuaries eventually manage other actuaries, developing leadership skills is necessary. After signing up as part of the AOF Section, I was able to get involved with organizing a speed networking event for actuaries. Creating an event of this type involved many different parties such as the local actuaries club, the AOF Section as well as the Entrepreneurial Actuaries Section. Starting planning early was important to allow time for input from all parties involved. This event has put my above-mentioned skills to use to make this event a possibility. Events of this type held in other cities have been successful, and so was this one. It gave local actuaries an opportunity to meet actuaries from other companies and earn CPD credit at the same time. The event helped actuaries improve their networking skills and expand their business relationships.

Getting involved in organizations either within your company or outside of it can help with moving toward becoming an "Actuary of the Future." There are a number of available opportunities such as volunteering, signing up for Toastmasters International or getting involved with the AOF Section. No matter what you sign up for, you are bound to improve the soft skills that every actuary needs: communication, networking, teamwork and leadership.
NOTE: The speed networking event Kate organized was held on March 7, 2011 in Philadelphia, PA. John Hadley and Pauline Reimer hosted the event and provided the 23 attendees with tips and pointers for effective networking. After the networking session, people were able to mingle with all participants and were encouraged to continue networking after the event.

If you are interested in volunteering in future events, contact us at *aof@soa.org.* ☆

More than Just Exams: Advice for College Students Considering Actuarial Science

by Sue Sames

This past summer, my daughter, who's a junior in college, sat me down and said, "Mom, you have got to tell me what to do." This was followed by, "What should I major in? Really, tell me how to get a job."

While my experiences with actuarial science over the last 25 years have limited applicability for my daughter, (who inherited my [lack of] athletic ability, not my math ability), her questions got me thinking about advice that I have specifically for college students considering actuarial science as a profession.

This is a great profession, and it's much more than just exams.

Success is more than just passing scores. Exams are a necessary, but not sufficient, condition for success as an actuary. Employers are looking for more than just the ability to pass exams. They are looking for the ability to communicate (in both written and oral forms), to think objectively, to think creatively, and to get along with others. In short, they want the complete package.

Exams are more than math. While the lower-level exams are math oriented, the upper-level ones require significant amounts reading and writing.

Exams take more time than you may think. Be realistic about what it takes to pass and realize you'll be committing to spending a lot of time studying for exams for five to seven to 10 years after graduating. Exams can take 300 to 500 hours of studying per session.

Education is so much more than exam preparation. It's learning how to learn. It's learning how to apply concepts. It's learning how to get along with peers and developing self-discipline. It's learning to balance work and social life. It's an unprecedented time for reflection and exploration.

Job responsibilities go way beyond what's taught on exams. There is a lot of on-the-job training. You need to be prepared for that and excited by the prospect.

EDUCATION IS SO MUCH MORE THAN EXAM PREPARATION. IT'S LEARNING HOW TO LEARN.

And finally, don't lose sight of what's beyond actuarial science and exams.

Have a "Plan B." Don't limit yourself to actuarial science opportunities to such an extent that you overlook other prospects. You need something to fall back on if you are not able to get a job as an actuary.

Be responsible for your finances and protect your credit rating. Understand realistically what your financial situation is, especially if you are getting help from your parents or through student loans. Don't go into debt if you can help it, and, if you can't, understand it well enough to be able to manage it.

My intention here is to help students be realistic as they consider this profession and to help them see that there's more to it than just passing exams. ☆

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