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Cyberbug: Actuarial Education and the Lessons of History

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Mr. David M. Holland: The book, *Financial Economics with Applications to Investments, Insurance, and Pensions* is one of the projects that the Society of Actuaries Foundation has undertaken. I think Harry Panjer has been one of the guiding lights, and we're very happy to have this book almost ready for distribution. You'll notice that we have a little deceptive marketing in the title—it's called *Financial Economics with Applications to Investments, Insurance, and Pensions*. Actuaries aren't mentioned in the title. We hope that this will attract a number of potential readers and whenever they do read it, they will see from what we presented that there's a big role for actuaries in this particular area.

The actuarial profession is blessed with tremendous intellectual capital. I'm delighted that we're able to showcase some in Jim Hickman's excellent presentation at the General Session. We wanted to challenge you with someone who would not just talk about the world as it was and is, but someone who would stretch our minds by discussing the world as it could be, but not necessarily will be. That someone within the profession is Michael Cowell.

We've mentioned earlier that the presentation that Jim had was tied to some degree with his role at the Bowles Symposium, the Bowles chairperson at Georgia State University. When Jim was organizing the symposium, he called Mike and asked him to participate. He didn't realize what a literalist Mike was. He said, "I'd like for you to come up with a novel approach to addressing this topic," and soon there was, the novel, *Cyberbug*. Mike is a distinguished member of our profession. He is

a vice president and corporate actuary for UNUM Life Insurance Company in Portland, Maine. He received his bachelor of arts degree in mathematics from the University of Michigan. In addition to being an Fellow of the Society of Actuaries (FSA), he is a Fellow of the Canadian Institute of Actuaries (FCIA), an Associate of the Institute of Actuaries (AIA), and a Chartered Life Underwriter (CLU).

He has participated in the SOA in many capacities. He has been a member of the Board of Governors both as a regular member and as vice president and treasurer. He has served on numerous Education and Examination (E&E) Committees including holding the role of general chairperson of the E&E process. He served on the Committee on Planning and the Human Immunodeficiency Virus (HIV) committee. He currently serves as editor for the Society's new monograph series. He has also been the editor of *The Actuary*, the Society of Actuaries newsletter. He has published papers on mortality differences between smokers and nonsmokers and acquired immune deficiency syndrome (AIDS), HIV mortality, and life insurance.

Mr. Michael J. Cowell: It is a distinct privilege and a special honor for somebody whose career has been almost entirely in life and disability insurance to be addressing such a distinguished gathering of fellow actuaries and guests, especially actuaries in health care and pension practice. Last year, as Dave indicated, Jim Hickman invited me to participate in the Bowles symposium which addressed the challenges posed by the graying of the developed world. The focus was retirement security and health care. My remarks regarding actuarial education and the lessons of history are a response to Jim Hickman. I'll give some insights into the study of history that I find helpful when peering into the future and address the role of education in bridging from our actuarial yesterdays to our tomorrow.

Jim will attest that he made it quite clear that last year's symposium was not to be just another parade of talking heads regurgitating ad nauseam the problems of funding social security and retiree medical care and the need for higher levels of savings. But having looked at these topics from a personal planning perspective, because my own retirement is not too far on the horizon, I hit upon the idea of a storybook actuary who would take on these challenges professionally and, at the same time, grapple with them personally. My first attempt at fiction was a little rough at first but once underway, I experienced that same sensation other authors have described—no sooner do you breathe life into your characters, then they start taking over. The author then becomes little more than a recorder of the events in their lives who peaks in on them as they hatch out their own little intrigues. While I had some general notion of the plot I hoped to create, I simply had no idea just how tangled the web Bill Wainwright would wind up weaving for himself.

Luckily I had help along the way. I will go very quickly over the list of people who helped me. There's Jim Hickman who I still consider Bill Wainwright's godfather, and Dan Squire from UNUM. You may have read some of Dan's work in the *North American Actuarial Journal* on the actuarial issues and the novels of Jane Austin so we do have some precedent for actuarial literary experience. If Jim Hickman was Bill Wainwright's godfather, then Jim Toole has certainly been midwife to this second birth of Bill Wainwright. Thanks also to Dave Holland and Anna Rappaport for putting me on the program, and Anna's and Jim's reviews are in *The Actuary*. Linda Delgadillo and Barbara Simmons and the wonderful staff at the Society office put up with me, and they know I'm not an easy person to deal with when it comes to editing.

The common thread that runs through our work as actuaries is that we deal in contingent events, events that, if they do occur, can seriously affect the lives of our clients, their employees, and those who purchase insurance products to cushion the financial impact of such adversities. My primary purpose in writing *Cyberbug* was to challenge fellow actuaries in the way that they think about contingencies, especially those events that will shape and be shaped by the waves of graying citizens who will populate the 21st century. I shall be delighted if this novel approach to retirement security and health care financing, hardly light reading, stimulates interest beyond our actuarial community. It's not that the public isn't interested in the future as entertainment, but when you look at movies like *Star Wars*, the future is often portrayed as so far in distant time and space that the readers and the viewers just don't relate to it personally. This is why the life of our protagonist is set in a time during which many actuaries living today will be spending a good part of their professional careers. For this reason, especially, *Cyberbug* had to be plausible. The one future that was staged for Bill Wainwright and company is intended to come across as a possible, if not always the most probable, scenario.

Bill Wainwright is confronted with complex, social demographic, geopolitical, economic, and technological changes that we could imagine for the 21st century, and they are not just the obvious ones like financial security and health care for a rapidly growing population of elders. He is confronted by the more subtle choices involved in channeling resources away from one segment of society and toward another. And to make such issues seem more than mere statistical abstractions, symbols scrolled on some huge socio-economic canvas, it was essential that Bill not only address them in the context of his professional work, as challenging as that turns out to be, but also grapple with the related events as they impinge on his somewhat convoluted family life.

Like many of us who imagine futures, I looked first to the past; hence, the citation from Santayana that those who cannot remember the past are condemned to repeat it. However, I am not a proponent of the corollary of this citation, that mere remembrances of the past, are sufficient to avoid repeating it. After Edmund Burke witnessed the French revolution, he wrote in a letter to the National Assembly in 1791 that you can never plan the future by the past. Konrad Adenauer, in reflecting on World War II, the most significant event in his life, described history in terms of the sum total of things that could have been avoided. Yet, in so much of what we do, we tend to assume that patterns of mortality, morbidity and, to a lesser extent, investment results, will bear at least some resemblance to what has gone before. Are we perhaps too dependent on the lessons of history? Mark Twain seems to have come as close as any by saying that history doesn't repeat itself, but it rhymes. At least this is attributed to Twain by David Hackett Fisher in his *Great Wave*, a book that I highly recommend for all actuaries and amateur economists and to which I shall return in a moment.

Those of us not proud to admit our age still talk of sources and characteristics from the old Part Five. We studied the Carlyle and Northampton tables. Some of us even rediscovered John Graunt who constructed mortality tables in the 1660s by noting the ages of death of people buried in the parish churches of London. But imagine a time about as far back from Graunt's in the 1660s as we are today in the 1990s from his time. This is a census of the adult male population of a rural English community from 1265–1300. If asked to project population 50 years out, a demographer of that time might have come up with something like this. Reasonable? Here is the actual population. What happened? Something that nobody had ever heard or read about or could have imagined—the Black Death. It took foothold in southern Italy in late 1347, and it swept like a tide inexorably northward until it spent itself in Scandinavia in early 1351 leaving an estimated quarter to a third of most European populations dead in its wake. It was, in fact, the Black Death that Fisher cites as the crisis that brought an end to the first of his *Great Waves*. Fisher was a history professor at Brandeis University. In his fascinating work, he presents an eight century long sweep of social and economic trends based on price changes reconstructed back to the late 12th century. He documents four such Great Waves over the past 800 years, the first three lasting approximately 170, 160, and 90 years, respectively. Each wave was preceded by a long period of price equilibrium, which then developed energy from inflation and the economic instability that ensued. As inequality of wealth and income increased, the economy became ever more volatile. The wave eventually crashed, and its demise was triggered by a single event or confluence of events that led to major ruptures in the social and economic fabric.

The first wave was brought crashing down by the Black Death in the 1350s, the second by a series of disastrous harvests in Europe in the middle of the 1600s, and the third by a revolution, ours in 1776 and the French revolution in 1789, and by several costly European wars that ended in 1815 with the defeat of Napoleon at Waterloo. In each case, and especially with the poor harvests of the 1640s, there were forces, during a period of economic equilibrium and social stability, that might have been absorbed or the severity attenuated were in the highly stressed and fragile environment in stages of the wave powerful enough to drag the system down to total collapse. By Fisher's reckoning, we would currently be in the late autumn of a cycle that commenced around 1820, the end of James Monroe's first term. Monroe was visiting Thomas Jefferson at Monticello, and Jefferson was still corresponding with his old adversary, John Adams. The girl who was to become Queen Victoria was then just one year old. Also in London, Gompertz was researching his famous law of mortality, and in Philadelphia, Robert Patterson, the first entry in Jack Moorhead's list of leading North American actuaries of the early 19th century, was developing a prototype of the retirement annuity for the Presbyterian minister's fund that Jim Hickman discussed.

Ezechiel Wainwright, Bill's great, great, great grandfather was tracking westward from the hard scabbled soil of his native New England searching for some good Wisconsin land to farm on what was then the U.S. frontier. During almost a century of relative peace in Europe, and with the one major exception in the U.S., inflation was almost nonexistent. What's surprising, given real wages of most workers in the industrializing nations almost tripled between 1800 and 1900, is there was relatively little change in the distribution of income. Fisher characterizes the era from 1820 to 1896 as the Victorian equilibrium; it was, for the most part, a rising tide that lifted all boats. Fisher observes similar patterns in other European countries, with the noted exception of the Civil War period, in the U.S.

There is a most remarkable coincidence. Fisher chose June 22, 1897, exactly one month and 100 years short to the very day of this meeting. It was the day that London celebrated the 60th anniversary of Victoria's reign to demarcate the end of the economic calm named after her and the beginning of the fourth great wave whose crest we are still riding. The annual yield on gilt-edged British government securities was then 2%, considered an appropriate risk-free return in that zero-inflation environment. The pound sterling in 1897 with Victoria on it, a U.S. half eagle \$5 piece, a Czar Nicholas \$10 ruble, and a ten-ruble piece, all looked similar because they're all one quarter ounce of pure gold, and they each purchased more on that day in 1897 than they did back in 1819.

In those last few years at the close of the 19th century, the pace of business quickened. In the U.S., Canada, Britain, and in much of western Europe,

commodity prices began to increase at a rate of about 2% a year right up to the eve of World War I. Fisher cites the closing of the frontier as one of several explanations for the demand inflation that swept across our 20th century world. In this century alone, western Europe has seen price inflation that has exceeded that of all the seven prior centuries combined. Our own recent economic history—the Great Depression, World War II, the post-war recovery, the Cold War, and the eventual collapse of communism—is far more familiar to us than that of distant centuries.

If we had time, it might be instructive to delve deeper into the great wave that Fisher believes we're currently riding: its causes, its characteristics, and speculation as to its eventual fate. If you believe his theory, then how his current wave plays out should be of sufficient interest to our profession, and we should not ignore its implications for actuarial education.

Though I am a novice when it comes to speculative fiction and a rank amateur in economic history, my third topic is something I've been involved with for at least 30 years, almost 40 at a stretch, but I won't go back that far. I'll go back to 1981 when I completed my stint on the Education and Examination Committee. Our revered colleague and dear friend, the late Barry Watson, was then Vice President of the Society in charge of education. Barry and the board had asked Jim Murphy and I to describe the conceptual framework within which educational decisions were being made. Our response was summarized in this strategic premise for actuarial education which began with a look at what our professional forbearers had to say on the subject.

In 1881, Arthur Bailey was president of the Institute of Actuaries, and in his address to the Institute that year, he had said that an actuary should be a man of general culture with a knowledge both of books and men, and the more he has of both, the better. Allowing for the gender specific language of his day, I thought his prescription was remarkably succinct. The actuary, Bailey continued, comes in contact with various classes of the community, and will be of little use unless he can understand and sympathizes with the different objects for which he is consulted and can adapt himself to the different habits and thoughts of his clients—that was 1881.

This next quotation is from the report of our own Society's Board Task Force on Education from August 1996. The objects of the redesign of the education and examination process, the report says are to enhance the distinctive confidences of the actuary relative to other business professionals, to enhance the value of the actuary in the business environment, and to enhance the value of the actuary in fulfilling both traditional and nontraditional roles. Bailey's message echoes across

the years, from past actuarial generations, the observations that those of you laboring on our educational syllabus are making today. Most appropriately, the task force report addresses how our role differs from that of other financial professionals. It identifies the actuary's uniqueness in terms of the mathematical rigor we apply to practical problem solving. Even before reading the report, I recognized it was his exercise of mathematical rigor that would distinguish Bill Wainwright from most of his peers. A second and critical differentiation I referred to earlier is that, as actuaries, we deal in contingent events. In this regard, we act more as economic futurists, and I am pleased to see the recognition that the task force is giving to the role of economics along with finance in the actuaries' basic education.

What is Bill Wainwright's story if not one of contingent events who's impact here tends to measure and manage even as some of them manage him. At a recent Society symposium on actuarial modeling, Angus MacDonald of Harriet Watt University drew connections and contrasts among actuarial science, financial analysis, and econometrics. MacDonald's concern is that we may have moved too far from our once broad analytical perspectives to one in which we apply computational tools to solve rather narrowly defined problems involving interest mortality and asset/liability management. To prevent our science from becoming a professional dead-end branch, MacDonald urges the profession to rethink modeling in the context of a wider process that interrelates our traditional disciplines to those of the financial analyst and the economist, very apropos of the point that David mentioned in announcing the new text.

This brings me back full circle to my motivation in writing *Cyberbug*, which is a challenge to you, my fellow actuaries, in the way that we think about contingent events. I wonder, if I had read Fisher's *Great Wave* before I wrote my tale, would my book have come out differently? Would I have been tempted to weave even more socio-economic and political fatalism into Bill Wainwright's environment than I did? Might Bill have emerged even more like Homer's Achilles who lives his life as a series of experiences subject to the whims of the gods in contrast with a take-charge character like Ulysses who lives life as one great spectacle.

Recall that the one failing major realignment in Bill Wainwright's world was the end-stage result not of the social or economic forces, but of plate tectonics. Of course, we also see some major meteorological action shifting the world's reliance on food from the northern hemisphere to the southern. *Cyberbug* eludes the food shortages without being too explicit about their cause. From the time the next mini ice age arrives, its impact may not be as devastating as those of prior centuries. For the sake of our generations to come, let us hope not. It is conceivable that the technology of a third millennium will enable us to withstand such a climatic shift

and absorb its effects as mere inflation in food costs rather than the Malthusian outcomes that Jim Hickman discussed so well and that beset earlier generations.

Indeed, the horseman of some newer age apocalypse, whether or when it should arrive, may be as unfamiliar to Bill Wainwright and his contemporaries and as impossible to prepare for as the Black Death was six centuries ago for many of our ancestors. Choose your horseman: global warming, other failures of the ecosystem, biological or biogenetic accidents, nuclear terrorism, narcotic warfare, the list goes on. There's plenty of such doomsday fiction on the bookshelves and in the video stores that are far more entertaining and far more lucrative for its authors than a dull, and I can assure you of that, story about some 21st century actuary struggling with the problems of retirement security and health care financing. History does not necessarily repeat itself, but it does tend to rhyme. It was also said of Mark Twain's cat that it once sat on a hot stove. It never again sat on a hot stove, but it also never sat on a cold one. This is a classic example of trying to take more information from an experience than was in it. Quite conceivably, the great wave that Fisher believes we are now riding will not crash on some cataclysmic rock. It could break, not with a bang but with a proverbial whimper.

Suppose, for example, without any major crisis like a war, an earthquake or other palpable harbinger of doom, the west slowly drifts in the early 21st century into protracted deflation. Suppose India and China sharply decelerate their population growth. There's a global glut of commodities, price inflation falls to zero, and even becomes negative or, in the one scenario developed in *Cyberbug*, China democratizes and early in the new century sharply increases its per capita gross domestic product (GDP). With a population 40 times that of North America's, the implications of China with a per capita GDP even one quarter of ours would be prodigious. Imagine interest rates falling 300 or 400 basis points, a scenario by the way that is not so farfetched. A review of our own society's literature in the late 1940s, less than 50 years ago, shows that bond yields of 2.5% or lower were a cause of great concern for actuaries. Also a concern was dividend scales for policies with reserves and nonforfeiture values of 3.5%. What would the effect of a downward cycle of interest rates be on defined-benefit pension obligations discounted at 7.5% or 8%, and on the participants dependent on these plans? The events with which Bill Wainwright has to contend might be less exciting, but are perhaps no less of a challenge.

Conversely, imagine a shift perceived as favorable. The number of people taking responsibility for their own health doubles or even triples. Health care expenses actually decline. Longevity increases outstrip annuity table predictions, but savings in health costs become available to bolster the inadequacies in pension funding. Now how is that for an implausible scenario? For Bill Wainwright, it's a difficult

struggle to figure out how to model this phenomenon, but the potential for such scenarios is endless. We can only hope that our profession will step up to the challenges they pose with the same wisdom and diligence that Lincoln invoked at the height of the Civil War. Lincoln observed that the dogmas of the quiet past are inadequate for the stormy present.

Another likely distinction that can be made about the end of the current wave and that of its three predecessors, is that none of them had central bankers of strong nation states pretending to be managing their country's economies. There were no armies of economists with sophisticated analytical tools to measure the economy's every twitch. Can we entirely discount the operation of a kind of economic Heisenberg uncertainty principle, where nearly to measure the outcomes could be sufficient to change the events surrounding their occurrence?

In the 1981 strategic premise, I quoted something from Locksley Hall that was written in 1842 when Tennyson was still a young man, "For I dipped into the future far as human eye could see, saw the vision of the world and all the wonder that would be." As one dips into the future of the profession, it is sobering to reflect that, as a modern institution, it has emerged almost simultaneously with Fisher's cycle starting in the early 1800s. Its greatest growth has occurred during these latest stages of his current great wave.

What experience does our profession have? What will we need to withstand the waves? What continuing education should Bill Wainwright and his peers be pursuing, even as we speak, to better prepare themselves for whatever contingencies materialize in the 21st century?

Coincidentally, Fisher concludes the *Great Wave* with a passage from Locksley Hall 60 years after Tennyson wrote in 1886, and a few years before his death, "Chaos cosmos, cosmos chaos, who can tell how all will end. Read the wide world's annals you and take their wisdom for your friend. For then but still remember how the course of time will swerve, crook, and turn upon itself in many a backwards streaming curve." Let us learn well from the lessons of history. Our education and the changes now underway for the next generation of actuaries should stand us in good stead for tomorrow's opportunities.

We have reason to be optimistic. Ours is a profession constantly in the process of redesigning itself. How else can we explain three major shifts in our E&E structure over the past 30 years that will take us back once again to 8 exams? The actuarial profession has meant more to me than I could ever have imagined when I took my first examinations 40 years ago. I believe it has served our publics well, and I'm confident that, in your good hands, it will serve, even more fully, in the years

ahead. I wish you all good luck and God speed as we take on the challenges of this exciting new era.

Mr. Holland: Having peered somewhat into the future, what would you say is the biggest challenge for the actuarial profession, and what do you think we should have as our number one goal in terms of moving forward as a profession?

Mr. Cowell: Dave, this is something that, the older I get, the more I think about. I think about it not only in terms of the profession, but I also think about it personally. I alluded to it somewhat in my speech, and it is the same concern that Angus MacDonald talked about. We should not get too narrowly focused in stochastic modeling, sort of the early 21st century equivalence of the things that we struggled with 10, 20, 30, or 40 years ago, at the exclusion of what is really going on in the world and lose sight of who our true publics are and who we are really serving as a profession. I would say that staying on the top of technology is critical, but not losing sight of the events going on in the wide world in which we now operate is going to be extremely important.

From the Floor: Mike, I loved *Cyberbug*, I thought it was great, and I thought that it was particularly great because it helped me to see many of the connections between different things in our daily work—things that we tend to see with tunnel vision. I thought it was also great because of the whole issue of discontinuities. I would ask the question of advice for actuaries with regard to three things. First is the notion of how to learn more to help us identify discontinuities. I don't think that's particularly something that we focused on, but this is important and it actually came up in our session. Perhaps it's not so much discontinuities, but turning points. What advice do you have about learning how to think more about these inner connections as well? This weather scenario building is something that we should all be thinking about more.

Mr. Cowell: Your question really is excellent. It really goes to the heart of many of the reasons that I used the speculative fiction approach to present the somewhat more mundane concerns. I know they're serious, but they are relatively mundane concerns, like how you finance health care and retirement security. There's not too much that you can really do to plan for discontinuities other than be extremely flexible. Had the dinosaurs anticipated the discontinuity 60 million years ago, they probably would have had planning groups to not get as big as they did, and stay closer to the ground. To echo MacDonald's comments, we should not become so overspecialized because I believe it is that overspecialization that creates the tunnel vision. As far as anticipating scenarios, read the wide world's annals and learn as much as you can. Those of us who may have the luxury of reading the latest technical material, other than the traditional syllabus material, can perhaps step

back and see the connections. I really don't know. It's certainly something that I'm going to be giving much more thought to, but I hope that at least gives you some idea of what I'm thinking.

From the Floor: I like the selections of history and poetry with us. Can you put a couple of readings from history or literature into the exam syllabus? What would you choose for us?

Mr. Cowell: I think I'll have to give that some thought. It's very difficult when you look at something as broad as history to pick out any one single reading. There was a time in my life when I thought that Gibbons', *Decline and Fall of the Roman Empire* was the greatest bit of knowledge I'd ever read. As I got older, I started reading other things and other perspectives on civilization, what I used to call western civilization. As I thought even more, I discovered that there is much more to the world than what I'd called western civilization. There was a whole area that eluded to in *Cyberbug* of Asian philosophy that totally escaped me. I wouldn't recommend adding more to the syllabus because it's already full. I think what I would do is suggest this as part of continuing education. It may be that we need to have the SOA continuing education people look at these issues. I think I'd be reluctant at this point to pick one philosopher or piece of history or poetry. Harold Bloom, in his book *The Western Canon*, outlines something and somebody else outlines something else. There is a great deal of controversy in colleges about what really constitutes the right course for history and philosophy. I think this is something that I'd have to give much more thought to. I've given you couple of ideas.

Mr. Holland: Jim was rather positive in his remarks about improvements in mortality and the potential for genetic testing and genetic information and what we're likely to learn. You discussed the Black Death and some of the things that are more negative in terms of possibilities. What would you say is your long-term outlook for mortality?

Mr. Cowell: A New York actuary is up visiting on the coast of Maine, and he had also read about Graunt and he had gotten into this bit about studying mortality by looking at the gravestones. It was the last day of his vacation, and he didn't have anything to do. The weather wasn't particularly good, so he was poking around the churchyard in this small Maine town and some old man was looking over the fence at him and wondering what he was doing. So he came up to the old man and said, "Excuse me, sir. Do you have any idea of what the mortality rate is in this town?" The old man looked at him and he said, "Yes, it's about one per person." And so my long-term outlook for mortality is that it will continue to be about one per person. On the positive side, I've studied nonsmokers and saw what can happen to

mortality and morbidity when people do take responsibility for their own health. I've also studied the negative side—the late 20th century equivalent of the plague, namely the HIV AIDS epidemic. I would say that I probably am about 51% optimistic and 49% pessimistic. I think there will be a gradual long-term improvement in mortality but, at some point, I think it's fair to say that the ultimate mortality rate for all of us will be one. The question I ask myself is not what will be the number of years in my life, but what will be the amount of life I can get in my years. When you get to my age you think in terms of how long you're going to live. When you're 20 years old, you think you're never going to die.

Mr. John E. O'Connor, Jr.*: Mike, I obviously enjoyed your book. It covered a wide variety of subjects. If you could pick out one single message that you want people to get from *Cyberbug*, what would it be?

Mr. Cowell: The one thing that I hope actuaries take away from this is that we need to be very broad thinking in the way that we manage, measure, and communicate contingent events. We have had people like Fred Kilbourn tell us that the fundamental or unique challenge we have is that we are the one profession that does measure and manage and communicate. I think we have done an outstanding job of measuring things to a degree that nobody else can understand. We're managing contingent events.

If I had a criticism, that's as much self-criticism as it is of the profession, it is that we do not communicate, even among ourselves and certainly not with the other communities with whom we come in contact. It's relevant to the quote from Arthur Bailey, "We do not communicate well our thinking regarding contingent events." I think we need to read, learn, study, broaden ourselves, open ourselves up to all manner of history, philosophy, and sociopolitical information, so when we make statements or when we present to our clients assertions, we can be sure we have really thought through the whole range of possibilities in a contingency.

Mr. Holland: The process that you described is very much the content of the modeling approach that we have in our new syllabus. What we're hearing about in other parts of the world is called the Actuarial Control Cycle, which is a very broad process approach to actuarial work. I hope that it will be something that we'll pick up from this and be able to include in our work.

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