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The Actuarial Profession and the Academic Community: The Case for Partnership

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Summary: Strengthening relations with the academic community has been a priority for the Society of Actuaries. Following a joint Casualty Actuarial Society, Canadian Institute of Actuaries, and Society of Actuaries symposium in 1998, a list of ideas to further enhance the relationship between the actuarial profession and the academic community was generated.

A joint task force recommended strengthening the partnership with the university system in North America in order to address some fundamental issues the profession faces as it moves into the next century.

Mr. R. Stephen Radcliffe: Each member of the panel will present part of the program. First, I will present an overview. Jim Hickman will then provide us with a vision for 2005. Fred Kilbourne is going to share several initiatives that the task force developed. Rob Brown will then share some of the ideas that we had with respect to accrediting actuarial programs and offering a single exam after completion of a university program.

There are two headlines for our work. First of all, I think that we have started an important discussion and introduced very interesting ideas that have improved the discourse between academics and the profession. This has been timely because of Education 2000. There are many questions that have arisen, and this dialogue has been very helpful in trading information between the two groups.

The second headline is that maybe we have started something that is fundamentally important and could lead to a transformation in the way we educate actuaries. I don't want you to jump to any conclusions, because these ideas are still evolving. Our task force is going to be handing off our work to another task force that's going to study the ideas of accreditation and a single exam.

First of all, we're building on a long-standing relationship between the profession and academics. The task force recommends that this relationship develop into a full partnership—a partnership where academia focuses on education and the

profession focuses on qualifying actuaries. This is not a new statement but is a profound one, because it is a meaningful change in the way our two groups are going to relate to each other in the future.

Our task force was appointed by Howard Bolnick. His strategic planning group developed the concept of the big tent. Part of the big tent focused on the future of actuaries and how we compete with other groups that are doing similar kinds of work. A 1998 symposium was called by Howard, and they discussed the ideas of how the university system and the profession could join to address some of the issues that came up out of the big-tent discussion. Our joint task force was named about a year ago. We started by identifying three reasons for building a full partnership. First, why not leverage the strength of the university system? Second, we found that we have competition, especially on the university campus, for the best and the brightest students. Finally, we found some global trends that we need to get in step with.

Let's talk about leveraging the university system. We talked a lot about the classroom as the best place to teach certain types of subjects. It certainly helps in developing two-way discourse, which is something actuaries need to be skilled at in these times. Independent study is fine, but it's not as robust and dynamic as a classroom setting with a professor guiding his or her pupils through the topics. In the classroom, you get a chance for team problem solving instead of individual problem solving. Often, if you ask an actuary to solve a problem, he or she will go to his or her office, figure out a list of considerations, and announce them as a solution. Individual study is not what is going on in today's business world. It's team concepts of problem solving, because the problems are usually so complex that you need a lot of different disciplines trading ideas to get the job done. These are actuarial courses that are perfect for the university setting. Modeling is a very key part of our skill set, and the university is the best place to accomplish this.

With respect to competition, we had a lot of anecdotal evidence, especially from the professors, that we were losing the best and brightest students to other disciplines. There are other programs around in well-known universities for financial engineers. We found that some students have decided there is a quicker way to get to the kind of work that they want to do at a better salary than our profession. We no longer have a monopoly. When I came out of school, there was only one good way to get into the insurance industry with a mathematical background. Today's students can do several different things that involve their skills as mathematicians and apply them to business. Our profession will need to present something to these students so they will choose it as their profession.

In terms of the global trends, our task force found that we are out of step. We first examined Mexico, which is entirely university based. They sometimes take some of our exams, but that's not how they qualify themselves as actuaries. They go through a university system. Thirty years ago, when we first started talking about an alternate route here in the U.S., the Australians took the idea and ran with it. They didn't have an exam system, so they needed something. Britain was too far away, and they were having trouble taking those exams. There was one person at one university who got an academic program started. It was so successful that

even Great Britain decided this was a good idea. They have copied many of the things that Australia was doing with exam exemption through university study. And finally, in Europe, we are seeing a trend towards university-based actuarial education. The SOA may be the only one left that is strictly a private exam-oriented system. We are probably not marching in the same parade that the rest of the world is.

The task force developed several objectives. First, on education, we want to go after the best and the brightest students. Second, we can provide both theoretical and practical research by teaming up with the universities. Third, we expect that this partnership will enhance the reputation of each party, first with each other (a greater respect and dialogue between the two groups) and finally with the public. The profession gains by appearing to be more independent rather than advocacy oriented for the insurance industry—not appearing as a trade association but as a truly scientific organization.

Another objective was to leverage the resources of both the profession and academics—two powerhouses coming together and building a better mousetrap. Who better can write our exam questions than the people who are teaching this subject in the universities? After all these years, we now finally have university professors writing study material and writing exam questions for our students. Another objective is to continue in the vein of the new Education 2000. The task force's proposals should continue an evolving trend for a flexible and dynamic education system. And finally, one of our objectives is to get back in step with the way the rest of the world is heading with respect to university training.

Let me conclude with the task force's accomplishments. In September 1998, we published a preliminary report, presenting our three reasons for a full partnership. We have worked on a revised college listing to correct some deficiencies. The new listing will provide a more meaningful description of academic programs to students, business, and government. We then wrote a paper on "Vision 2005," and from that we derived a list of initiatives that you will hear about later. We are now ready to publish a white paper. It's in draft form, and we just presented it to the board. We plan to disseminate it to all of our members in early 2000.

In order to be a good, sound profession, we have to have good science supporting it. To build that science, what better way than to join up with the universities? To strengthen our intellectual foundations, we should also broaden the spectrum of risks we consider. Instead of just life, pension, and casualty risks, there are other financial risks that we should be considering. As a profession, we are also moving from studying just the mean to studying the variance of random variables. Being adept at manipulating means is not very helpful in a world that needs to know more about risk and its value. I think the task force's vision works. Thirty years ago our profession tried the alternate-route idea. I also found that in the *North American Actuarial Journal*, Harold Ingram wrote a history of our education and examination system. The 1955 article speculated how we could join up with the universities to improve the education of actuaries. How can an idea that keeps coming back after 50 years be a bad idea?

Mr. James C. Hickman: My title is "Vision of Partnership," and you're going to hear me talk a lot about *partnership*. That, in fact, is the most important word. With respect to the word *vision*, I shall cite two Republican presidents. On the negative side, President George Bush admitted he didn't have any vision. Abraham Lincoln, however, said that by first knowing where we are and where we are heading, we could better judge what to do and how to do it. Your task force is choosing to follow the 16th president in trying to figure out where we are and where we should head.

When we talk about the vision of our partnership, we're also going to start by describing what we think the environment will be in the year 2005. What follows is part prediction and part hope. Some are not particularly courageous predictions. They are natural extensions of things that are going on. Some are things that we hope the profession can achieve. Clearly, when you look in the year 2005, it does not take a lot of projections, since by definition, they are all predictable.

One of the things that will drive the world is the baby-boom generation nearing retirement. The walls that impede commerce are crumbling down. If we are to be a profession, we will serve not only our national enterprises but international enterprises as well.

I believe that we are currently recognized as leading professionals, but we are no longer alone. There are a host of academic programs and professional designations that aspire to the same field of activity.

Enrollments in the mathematical sciences, at least in the U.S., have been declining. Also, math majors are moving to other professions.

In the next century we will differentiate between the haves and have-nots according to who can do calculus. The walls that we built for regulatory purposes around various financial industries are also tumbling down.

We have a vision about actuarial education becoming internationalized along with business. Just as business managers want interchangeable parts that they can count on, they also will want people they can count on. They want skills that they can count on at an international level. We already are engaged in programs of mutual recognition of actuarial credentials. We are also recognizing that the nature of the academic institution is changing rapidly, along with everything else. We may not deliver education the way I have delivered it during much of my working lifetime. We will deliver it in new ways.

Partnership means ideas going both ways. I think we have some ideas that need to be shared in high school and elementary education. There has been an enormous transfer of decision-making responsibility made within recent years to individuals with respect to their retirement income. Has the education system responded in giving the economic, mathematical, and statistical tools necessary? I think the answer is no.

We also recognize that a wide variety of schools currently teach actuarial science. In diversity, you get to find out who the winners are. We are sensitive to creating programs in which diversity and alternative solutions are advanced.

The final point is the one about specialization. Adam Smith was a strong believer in the division of labor and increased productivity. The task force has tried to emphasize that by letting some in our profession gain their credentials through academic programs, we can increase the efficiency of the entire profession. Much of the public discussion to date has centered on the idea of a comprehensive exam, but I don't think that at any time the task force has ever thought of a single path. In fact, I think we've been moved by the idea of multiple paths, in part to add additional flexibility to the system, as well as to aid us in our ability to pick out winners.

Your grandparents probably worked their working lifetime with skills they acquired before they were age 20. Today's graduates will have to be reeducated two or three times. If our profession is to survive, continuing education is a more immediate problem than basic education. The task force believes that partnerships with universities can produce better continuing education programs. There may well be fundamentally new things that you have to learn—for example, financial economics. Continuing education is the most pressing of our problems, and we believe that a partnership with academic institutions is a ready solution.

We recognize that we have to promote Ph.D. education. This will not be free. Ph.D.-level education involves both the continuation of our current efforts and perhaps more in the future. Economic growth today is based on new ideas. Our profession will live and die on the number of new ideas and people who apply them. Universities have been a major source of those ideas in pharmacy, engineering, and physics. They can also be a major source in actuarial science. The task force also stressed the importance of teamwork involving academics and practical actuaries working on actuarial problems. We have suggested internships; study programs for students; and sabbaticals for members who spend that time with consulting firms, a financial institution, or a regulatory agency. These are ideas of bringing actuaries to the campus either on a short- or long-term basis to promote the partnership.

Our vision, of course, includes not only the technical side but the professional side. We believe that through university education you have philosophy departments that teach ethics courses. You have communicators teaching courses in business communications. Therefore, we can involve students in not only technical actuarial work but also a broad group of development courses. We would expect the faculty to help us develop continuing education along the same lines for all of our members.

Let me summarize by noting that often actuaries have the opportunity to speak out on public issues. We need to present public and objective information. We gain credibility when we are backed by the prestige of our great independent universities.

Mr. Frederick W. Kilbourne: I will present the initiatives to make the vision a reality. The revised college listing is a major existing initiative that is under way. This will be coordinated with the new education system for the SOA. It will provide better information to various audiences about what is available in actuarial academia. The goals are to help students choose schools and to provide the academic community and others with information about actuarial science education. The categories of actuarial science programs are introductory undergraduate, advanced undergraduate, graduate with the emphasis on education or exclusively on education, and finally, graduate schools that include actuarial research. A near-term initiative is to transform this task force into a permanent joint committee. An important consideration is to have some degree of continuity to bridge what we already have done.

A second near-term initiative is to promote a direct interaction of individual actuaries with academic institutions. A third initiative is to have faculty contribute to and produce educational material for basic education and continuing education. We should also use actuarial academic faculty for the development of experience studies and actuarial tables. The final initiative is a clearinghouse linking faculty, business, or government actuaries who all work together on practical actuarial research projects. This includes the use of academic faculty and institutions, again for continuing education programs working within the programs in partnership with the business community and government.

Mr. Robert L. Brown: I'm just going to present some of the longer-term initiatives that we discussed and presented in the white paper. The first is for the profession: have academics take time away from their campuses and do primary research. This would be like an endowed chair, except it wouldn't exist at just one university. It could be held anywhere in the world, and it would be assigned to an individual. It would not require a specific request for proposal. It would not require a well-defined, targeted outcome. It would allow that person the time to do the thinking and writing that is difficult to do in a normal academic setting.

Another long-term initiative would be to assist in the establishment of research centers where we might combine a number of campuses, which could then bid for government contracts or research projects. This would be developed by the profession. It would put actuarial academics and the actuarial profession on the map when it comes to many public policy issues. We do have some situations where our programs suffer because of lack of funding. The profession could be the go-between from the academic community to the business community to help present the case that these programs are essential and needed. It could help the business community provide some funding to certain actuarial programs.

The last point has to do with the possibility of the SOA's accrediting some actuarial programs. The new listing of the college programs is a step toward collecting data that might allow us to identify programs for potential accreditation. The SOA then might be able to exert some level of oversight and try to strengthen certain university programs. We might then be able to approach them to help us with research in a number of different situations. If the profession expects to exert

some influence through the accreditation program, then it is logical for the university to ask, "What's in it for me?" Why would the SOA be allowed to have the ability to exert some influence and provide a *Good Housekeeping* seal of approval? These programs could have a potential advantage, bringing this logic full circle. The advantage would be that students in accredited programs would have the opportunity to write one uniform, comprehensive exam. If they went to an accredited program and achieved certain criteria, they would have the opportunity to write a comprehensive exam and then enter the professional syllabus at around Part 5.

The motivation here is twofold: (1) to get students into good actuarial programs so that they can be educated by educators and (2) to create stronger actuarial science programs.

Mr. Radcliffe: Just before we go to questions, let me tell you where the task force is on the development of the white paper. We have presented a draft, and hopefully we will get the draft approved so that we can present it to all the members sometime next year. At that point, our task force will be done with its work. Some initiatives will be handled by the permanent committee. The issues on accreditation and a comprehensive exam will be turned over to a new task force looking at education and qualification of actuaries in the year 2005. It will take the feedback from the white paper on those issues and advance them forward.

I will mention that we have a unique opportunity with this idea right now, because Howard Bolnick introduced it. Then, we have Norm Crowder coming in office, who is completely supportive of our work and our initiative. Finally, we have Rob Brown, who's the most interested in this idea of all three.

We have unique continuity in leadership on this idea that has never existed before, and we're hopeful. The task force's objective is to bring university training more directly into the education of actuaries. A comprehensive exam may be one of the solutions to get there. We decided not to use exam exemptions, which is what Australia and Great Britain did, because that idea was so resoundingly defeated in the 1980s.

Mr. John A. Beekman: One of the ideas that we pursued at Ball State University for a number of years, and that might be pursued at a number of other colleges and universities, was allowing students the opportunity to write honors theses. That is a wonderful development tool. It carries back to the old Part 1 actuarial exam that some of us took in years gone by, which was a language-comprehensive exam. It forced you to assimilate ideas from different disciplines. In those honors theses, we have explored demography, risk theory, and financial economics. I think this relates to the possibility that some day students will be taking their comprehensive exams at the master's level. It also relates to what Steve said at the beginning about team solutions to problems and what Jim has said about assimilating ideas from different subjects.

Mr. John C. Maynard: I'm an old-timer, and I've been out of touch with this important subject of education for some time. However, I'm urged to do this because I would like to see the discussion raised to a higher level. In saying that, I have the greatest respect for the presentations that have been made. I'd like to see a greater driving force behind the illustration of these ideas to engender a greater acceptance of them in the field of actuarial education. Why do other professions get in the position of going to the universities to influence the educational program? This applies to medicine, engineering, architecture, and industry. It's because those professions are performing a needed service for the population, and therefore, it becomes necessary for the ideas to be readily accepted. I would like to foster a greater understanding of actuarial science and to further the need for actuarial science as part of the driving force to get the very latest and best educational programs into existence.

In the last few months I was asked to write up a report on the actuaries who qualified for fellowships in the year 1949. Their period of service as actuaries coincides with the SOA's own 50-year period. In the course of doing this and having some very interesting conversations with these actuaries, I put together a little monograph that may be of interest to you, "What is the Real Nature of Actuarial Science?" The theme of the monograph is that actuarial science is the science that guides funds. It's the funding problem in which actuaries are experts. In life insurance, the focal point is the valuation actuary. In private pension plans, the pension actuary focuses on funding. An older actuary I've been in touch with lately is Jack Bragg. He's making a point that actuaries should begin to be consultants with individual people. Why? Because all individuals in the country have a need to look after their own retirement. If they are going to do that in a civilized society, they have to build up some assets to provide for their retirement. There's an obvious opening here for actuaries to expand their services more broadly than they have in the past.

Actuaries are the professionals in the matter of financial funding. The world needs them because there are so many funds, and this may be the entree that we're looking for to make the actuaries work more visible. Education has been the focal point of the actuarial service since it began; it should help to lead to greater acceptability of the many good ideas that are coming forth from the present committee.

Mr. Radcliffe: I couldn't agree with what you said more. It's the science that we need to emphasize. We have a special guest in the audience. This is serendipity—I just happened to meet him just before the session. Dr. Enrique de Alba is from Mexico. Could you tell us about actuarial education in Mexico and what's going on in your university?

Dr. Enrique de Alba: * I can speak about what's going on at my university, which in a sense reflects what goes on in Mexico. As you saw in the presentation, the SOA looked at the case of Mexico when exploring alternatives. The reason is that

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in Mexico, we actuaries go through the university. Once we get our degrees at the university, we get our titles or diplomas, and we can work as actuaries.

Some people start working while they're studying; other people just go through the program, get their degree, start working, and they're considered actuaries. But to start working as actuaries at different levels, all you need is to get your college degree. My university is known in Mexico for its influence in economics. We are run by Chicago-trained economists, so I believe in the market, and I guess it works.

There is a large variance in the training of actuaries in Mexico. There are only seven or eight universities that offer the actuarial degree. The market can identify the good actuarial students. The government doesn't have to establish a minimum, and we don't like the idea of a minimum. We believe firmly in the market to select actuarial talent, and we are happy with the current setup.

Our students get their college degrees as actuaries, and many of them go on to get their master's in math finance programs. So they have the advantage of having the two degrees. I sometimes hear that actuaries may be losing ground to some of these new finance programs because you can get very good training in a very short time. You can also get better salaries in finance. I'd sum up by saying the training through the universities works. It works well if you believe in the market. I don't see how the U.S. and Canada cannot believe in the market.

Mr. Radcliffe: I want to add one footnote. When I was President of the SOA, we were working on the North American Free Trade Agreement for actuarial practice in each country. I was extremely impressed with what we saw in Mexico. And as a matter of fact, it turned out that the Mexican actuaries were quite concerned that we did not require a university degree to be a professional in the U.S. and Canada. Maybe the U.S. and Canada should require a degree to advance professionalism. It was interesting that the Mexican perspective was that we needed to be more professional. We were anticipating the opposite.

Mr. Christopher David Daykin: I'm wearing my hat as chair of the University Liaison Committee of the Institute and Faculty of Actuaries. In Europe, there is much more of a tradition of university education for the actuarial profession. That prevails over the major part of continental Europe. In the U.K., we have a bit of a halfway house in the sense that we have the professional education available, but we also have a number of universities that offer programs. For quite a number of years now, we have recognized a number of those universities as qualifying for exemption from the faculty and institute examinations. That's not just in the U.K. We also have universities in other countries such as South Africa, Singapore, Hong Kong, and Israel that are reaching those standards. To be in that exemption category, they have to teach according to our syllabus or at least cover our syllabus. They have to have an external examiner who's a fellow of one of our bodies on their examining panel. Those are basically the criteria, except they must set high standards for passing people through those exams, which are controlled by the external examiner. We don't have as many programs to worry about as you might have in the U.S., but we are very confident in the quality of the teaching. Our exemptions take our students about halfway through the examinations. We've just recently adopted the possibility of exemption for the next two stages—the 200 series communication examination and the 300 series application examinations in

investment, life insurance, general insurance, and pensions. Then somebody could come out of the university program requiring only the fellowship exam. We would still have a three-year requirement of experience before he or she could be admitted to fellowship.

We are in the process of encouraging new universities in the U.K. to introduce actuarial programs—schools such as Oxford, Cambridge, Durham, and other universities that are prominent in the U.K. We're not necessarily expecting them to introduce actuarial science degrees, but we want them to have actuarial science elements in all of their math programs and economics programs. We would expect a mathematician going through Cambridge to have the option of studying some actuarial mathematics, some financial mathematics, and risk theory as part of the standard mathematics program. We see this as a big part of the sort of big-tent philosophy, as you would call it over here. A bind we're in at the moment is that actuaries are recruited by existing employers of actuaries, insurance companies and consulting firms. Therefore, they go into traditional jobs, because that's where the recruitment is. If people come out of a university with an actuarial science background, they'll go into merchant banks, retail banks, and investment houses, where financial and actuarial mathematical skills are useful, and they won't be bound by the traditional routes.

Lastly, the value of our liaison committee is to encourage and promote relationships between the universities and the profession. We provide a way for the universities to talk to the profession and for the profession to talk to the universities. As a profession, we can talk to the university funding agencies and the quality assurance agencies on behalf of professional actuaries in the universities who are concerned that actuarial science should receive the recognition it's due in research analysis and so on. We try to promote the actuarial profession to students of these programs by running events directed to the students who have graduated. We encourage them to join the profession and to become associated with the profession. Hopefully this is something that will build the relationship between the profession and the universities.

Ms. Pamela J. Larson:^{*} I've worked in the social insurance profession for 12 years. Because the task force recommends encouraging and supporting the development of interdisciplinary research centers and academic institutions which address major issues with an actuarial component, I wanted to mention that in the 1980s, the government helped develop gerontology centers around the country. The study of aging has major actuarial components. I think there were probably ten research centers that were funded. Six centers still remain at campuses where we have active actuarial departments. In the 1990s, the Social Security Administration funded centers on retirement issues. We need to get more research awards. My reading of the research agendas that are coming out is that there's not enough involvement of the actuarial profession. Making good use of funds from the government and linking in with those two interdisciplinary resource centers is a direction our profession should take.

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From the Floor: I'm one of those who have received their FSA in the last five years and gone through the exam process. I just had one concern, one comment about the Mexican example and your comment about the prestige of the actuarial profession. Is there a significant fallout of those who are not meeting the market's expectations? That could hurt the prestige of the profession. Without having standardized testing, the quality of actuaries could deteriorate.

Mr. Harry H. Panjer: I think Dr. de Alba in discussing Mexico and Chris Dakin in discussing the U.K. situation indicated what an incremental step this notion of a comprehensive examination is in the scheme of things. It is so limited, and yet it seems to be the biggest stumbling block in this whole effort. I know that you are now attempting to separate that element out so that it does not get in the way of other initiatives. The real objective is to attract highly skilled students. The competition is at the graduate level. Students entering financial engineering are largely master's degree students. Employers are also finding that our actuarial students are very good in those other jobs. We really do have to find a solution to compete effectively. There are some serious political hurdles in the SOA for even taking this tiny, incremental step, so I wish you luck.