

RECORD OF SOCIETY OF ACTUARIES 1988 VOL. 14 NO. 4B

THE ACTUARY OF THE FUTURE/ THE FUTURE OF THE ACTUARY

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- o The demand for actuaries in the 21st Century
- o What actuaries will be doing in the 21st Century
- o Implications for the selection, education and training of actuaries

MR. JAMES J. MURPHY: Our purpose is to give you an outline of our task force findings essentially related to the report we developed and presented to the board. Our task force was given the charge to study and make recommendations concerning the future roles of the actuary and the professional activities necessary to prepare and support actuaries for those roles. The task force consisted of a number of people selected to give us a wide representation of various areas of practice.

We have tried to develop a good picture of the profession as it is. Almost all of the people on the committee have been active in the profession and have some feel for this issue. We had quite a bit of material to rely on to get us started. This issue has been looked at by the Planning Committee of the SOA for about 7 years now with different names. Gary Corbett discussed "The Value of the FSA," in his presidential address or what we now call "The Actuary of the Future." Thanks to input from Jim Anderson, a well-known futurist, we spent some time working on a concept called a vision matrix to try and identify areas where the actuary might be serving in the future. Bob will show you the results of that. We put out a questionnaire and sent it to all readers of *The Actuary* and also handed it out at the spring meetings in 1988. It was really designed to develop awareness and just get some general input, but we got nearly 400 responses. So we did analyze it and I'll show you some of the results.

As I said, we had open forums in each of the Society's spring meetings. Those were designed specifically to get input for this report that we are now summarizing. Now we are hoping to get some reaction to what we put together as a result of our efforts. We conducted a number of executive interviews with people who would give us an outside perspective, people who use actuaries in one way or another and work with us, so that we'd have an interesting view that would be different from our own. I wrote to a number of the Society's committees to get their input on what they were doing, where they were going, and what they saw in the future. When I come back at the end and talk about our recommendations, you'll see that they're going to be important in moving forward. With respect to the questionnaire, as I said, we had nearly 400

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responses which flabbergasted all of us. I was very pleased with that result, and I wish I would have planned on that.

Dr. Holmberg of the Society staff was not pleased that the questionnaire had not really been designed for easy analysis, but she went ahead and analyzed it for us anyway. We asked people what they were doing, what their area of practice was and whether or not they felt their prospects were good in their area. Sixty-eight percent said that they felt the prospects were good in their area. Even with that statement, 59% felt that the actuary's role was declining in some areas. The top three areas mentioned were pensions, number crunching, and upper management, which covers a pretty broad spectrum of what we do.

Those who thought of themselves as pension actuaries were more likely to think that their area was declining than those who thought of themselves as employee benefit actuaries. Very subtle distinction, but you could see it in the results. We had some feeling there was some apathy or disagreement within the profession about some of the concerns of the leadership. Yet I think 59% have seen some decline somewhere, which says to us that there is some sympathy with our concerns. Another question we asked looked at what other professionals were invading actuarial turf. The most frequently mentioned by the respondents -- accountants, economists and legislators -- seem somehow to be lumped together. Also included were MBAs, which the leadership has tended to feel is an area of concern, and investment specialists. We asked people what skills they thought would make them better prepared for the future. The number one item was communication skills. Management skills came in number two. Familiarity and ability to know how to use the computer was number three. Investments was number four. A lot of people saw a need for us to have a better background in the investment area to be better prepared for future activities. We got a lot of ideas from the respondents; we summarized them in our report.

MR. FREDERICK W. KILBOURNE: The outsiders told us a lot of things about ourselves. We were told by these outsiders that we are skilled, bright, narrow, defensive (we took umbrage at that, of course); we were also perceived as arrogant and rigid -- all things I think that we recognize and take pride in. We were told that we lack some other things, especially communication skills. Other traits often lacking include financial acumen, management skills, and good use of management information. We did hear over and over that our primary strength is problem solving: identifying problems to some extent, but also being able to analyze and come up with solutions. We should capitalize on that and build on that; I will get to that later when we talk about the core of the profession. They said we make things complicated, which again I took to be a compliment. We should escape stereotyping. I don't understand that one. The outsiders spoke well about our ethics, and I think that this is a strong point of the profession. In general, we are considered to be a strong ethical profession. One of the reasons is the high meeting attendance, I think, in the community of actuaries. We tend to take our profession seriously and it's a matter of importance to us that we not be outcasts. Actuaries were considered to work in the intersection of the fields of money and risk; this seemed to come out of the interviews that we had. That's our natural area and I'll refer to this again later. Of course, there were all the usual references to how you have to prepare for the future and all of that. But, being actuaries, we don't need any advice in that area. Or do we?

Let me speak a bit about the demographics of the actuarial profession as well as stereotypical characteristics of actuaries. There are about 11,000 of us in the

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U.S., I believe, and about 2,000 in Canada, which makes for a slightly better per capita representation north of the border. About half of that total work in insurance companies or on the insurance side of financial service organizations. A little over 80% of those, I think, would consider themselves to be life or health actuaries with about 20% property/casualty, although that proportion is smaller in Canada. About 45% are consulting actuaries, mostly in employee benefits, but with a fair number in insurance as well. An increasing proportion there, too, are on the casualty side. Other actuaries work in government, academia, and investment areas, but these comprise a very small proportion of the profession. As we get into what the core of our profession is I think the opportunity is there for actuaries to be involved in other industries at some time in the future. Actuaries also have the benefit of six professional organizations: SOA, CAS, CAPP, AAA, CIA and the American Society of Pension Actuaries.

Now, what about the characteristics of the actuary today? These are some that the task force agreed upon. They say that stereotypes have a kernel of truth to them although they are, of course, grossly unfair to some number of individuals, particularly me. The stereotypical actuary has a bachelor's degree in math from a large university, usually not an Ivy League university as opposed to some fields like management consulting where it usually is from an Ivy League university. The actuary earns a relatively high income and thinks of himself as a moderate conservative, but he's really apolitical. He's highly intelligent, particularly in numerical skills, but also has good basic verbal skills. He is not generally considered a good communicator, perhaps because the emphasis in universities and in our field is on emphasizing technical training, technical applications. The actuary tends to work too hard. He is, as I indicated earlier, an ethical professional, and I don't think it's so much that the actuary avoids public responsibilities as failing to recognize the public's need for actuarial services. We tend to get involved in our day-to-day work and fail to realize the importance to the public of the work that we're doing. Again, looking ahead a bit, the extent to which the public needs actuarial services and we are not providing those services, I think, is very considerable. The actuary is a futurist, but tends to look backward and does lack perspective. Again, this is a stereotype. He is a linear thinker and has a dominant left brain, but we've heard that so many times. I think there's some truth to it. And, of course, the actuary jogs regularly and keeps meticulous track of his mileage. That's somewhat true, I know.

The task force saw the actuarial core as having three components to it. Two are listed here. The first is a unifying force to the profession which revolves in some way around the common experience of the actuarial exams. That is not all that holds us together, but it is one aspect of the glue that keeps the actuarial profession together. Another common thread of our profession is that we are the architects who design the technical foundation of financial security programs. I saw several different colors to that thread: casualty, life, pension, and health. The intellectual core of the profession, the task force felt, was reasonably represented by this over-simplified formula:

$$A \times q \times v$$

The work that we do for the intellectual foundation of the profession tends to fall uniquely within this brief set of symbols, where "q" is the probability of the future event, "A" the cost of the event, the financial implications, and "v" a factor to reflect the time value of money. Now I don't at all mean to indicate that the actuary is confined to technical matters; of course, even if that were

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so, the fact that we deal with the future, the land of uncertainty, means that we have to go outside any narrow interpretation of the field to properly fulfill the functions of an actuary. I think the applications of actuarial science can go well beyond technical foundations.

I saw three steps to the work that actuaries do; I will try to describe them. Then we'll apply those three steps to an evaluation of our own future. We work from data to project the future but that's not all. We have to take into account things that we may know that come from knowledge other than just the statistical evaluation of data. The third step is to recognize the possibility that we, or others using our advice, might be able to do something about this. Maybe I can illustrate this. Step one is the simple evaluation of statistical data and projecting the future from it. If our historical experience shows us the numbers one, two, three, four, five and we are asked to come up with three more points in the future, the first step would lead us to come up with the numbers six, seven, and eight. But, if we have additional knowledge about the environment, for instance that the government in its wisdom has outlawed even numbers, then the next three numbers are seven, nine, and eleven, of course. That's what I call the passive adjustment of the statistical indications, but there seem to be more and more indications that we actuaries can do better for ourselves and for the public if we will go beyond the mere passive adjustment. Suppose, for example, that we felt although the government had been very wise in outlawing even numbers, we should push for and eventually be successful in getting legislation that also outlaws prime numbers. So then the next three numbers would be nine, fifteen, and twenty-one.

It seems to me there are three ways that we can approach the future. One is to stay with a successful formula. We have been the technical people for the insurance and pension industry and we can project in the future there will be a need for actuaries in those confined areas and continue our education in the same way. Maybe the future will allow us to continue to exist under that strict statistical projection. But it may be better for us to recognize some other forces on us. For example, life insurance seems to be taking on new characteristics, and it may be wise to recognize that the actuary should become involved with the asset side of the balance sheet as well as the liability side. Hence, more people should be trained in investments and so forth. This would be a reaction in a positive sense to the outside environment in which we have to work. But, perhaps we can do more than that and actively determine what need there is for actuarial services both within and outside the financial services industry and do something to meet those actuarial needs wherever they may be found. My favorite example of an unmet actuarial need can be found on the front page of major papers almost every day. That is when politicians are making promises that will be paid for in the future, and nobody is taking an analytical approach to the future costs of those promises. The task force feels comfortable, I think, with the intellectual core and the foundation of the actuarial field as it emerged. Then we looked ahead.

MR. ROBERT D. SHAPIRO: We did attempt to break away from what we normally do as actuaries, and try to put ourselves 15 or 20 years in the future to define what might be out there, what opportunities might exist, what needs for actuarial and quasi-actuarial services might exist. We then tried to put this all together in some kind of framework where we can analyze what all the skills or capabilities of actuaries as we know them today are and how they might fit the needs and requirements of the public in the future. When we really looked at this, we thought of a cube; we looked at it in three dimensions. We considered

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skills, skills that we have, skills that we might need or should have. We looked at it in terms of businesses served. Traditionally, actuaries have been thought of as serving the insurance business -- life and casualty -- or the employee benefit or pension business. We tried to look at a broader range of businesses that might have a need for actuarial services. We've also dealt with the perspective that the actuary has taken and might benefit from having. One example of that perspective would be that actuaries are very good at solving problems. Critics have said we're not so good at dealing with unstructured problems. More and more of the things we face aren't very well-structured; there's not a very clear experience base, and there's not a very clear formula to use. People have said that sometimes actuaries will make up the structure to come up with one answer, whereas there really isn't a right answer in the nonstructured situation. It's an area where we try to at least discuss among us and attempt to deal with in some way the fact that we just don't have as much structure and nice even trends as we used to have. So what do we do?

First of all, we concluded as you might suspect that the actuary of the future, thinking again of the future as being 10, 15, 20 years hence, will deal with a variety of new contingencies in business through an expanded perspective. In the past five or ten years some new contingencies have emerged. For example, there are companies that are set up now to insure the timely payment of principal and interest under municipal bonds and even corporate bonds. So now we're dealing with default risks on bonds, salvage or cure ratios on bonds. That's something that was not really considered 20 years ago. Actuaries are involved in those programs. We've seen a segmentation of some of the things we used to do in a big lump, like mortality studies. The SOA has traditionally studied mortality and we have been getting those aggregate mortality rates every year. For years that was fine, but it got to be 1980 and we suddenly had more male/female, smoker/nonsmoker, preferred/standard kinds of risks. None of those statistics really were specific enough so we had to start to deal with segmentation of the way we normally did things. Looking to the future we're obviously going to have to deal with contingencies involving inflation, volatility in our economy and businesses, and epidemics like this AIDS crisis that we're going through now. We tended to forget these things perhaps because nothing had happened for a long time. Other considerations include political change, things like unisex; changes in risk classification that may come to pass beyond unisex; new businesses; issues like performance standards in our companies that relate to quality or innovation. How do we deal with those? Are there risks involved in those? How do we measure them? All those things seem to suggest there will be a lot of different things in our arsenal of contingencies in 15 or 20 years in terms of businesses. We talked about a number of things. You're seeing actuaries in investment banking, trust departments, law firms, management consulting firms and a lot of other businesses. Some of the further-out businesses we talked about would include utilities. If you look at the way utilities are priced and managed, there is certainly an actuarial component. Whether that's an appropriate one for us is certainly a subject of discussion. But anyway, that will give you a sense of the range of what we were talking about. We believe that the actuary of the future will strengthen our role in areas where actuaries are, or should be, uniquely qualified. We also talked about trying to identify and address areas where we're qualified (but not uniquely), where we might bring something special to the table. One example of that might be asset liability management in our financial institutions where we bring our analytical capabilities, but we aren't necessarily uniquely qualified to deal with the asset side of the balance sheet.

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Ultimately, it has been put together in what we call the vision matrix (Graph 1). What we did in this vision matrix is try to look at the functions that an Actuary might perform and analyze them against the range of businesses that we might perform them in (users of our services might be a better term than businesses). We really looked at it in four dimensions. First we looked at the application of traditional functions with traditional users; then we looked at new functions and traditional users. Finally, traditional functions and new users and new functions and new users were included in our four-step analysis. These are the traditional functions and users. Basically the asterisk will tell you where the people who contributed to this analysis said we have huge future opportunity and the plus sign indicates that the need is not well met today. You can see there's a pretty broad range especially when we talk about pricing, valuation, solvency and taxes, etc. Most people think there will be continuing opportunity in most areas outside of taxation and some government roles. We're meeting these needs pretty well today. In the second quadrant of the matrix, we started to look within the same users at some other functions that we either are or might consider performing, like valuation of assets, strategic planning and so on. You can see there's some high ratings for future opportunity in areas where at least traditionally we haven't been thought of as being the lead candidates to do those jobs -- for example, in strategic planning or corporate finance in the insurance and employee benefit areas. I think I was impressed by how people felt there is a much broader range of opportunities than I thought might come out of this relative to what we're thought of as doing today. As we looked at this, however, there are people in our profession doing just those things that most of us aren't doing right now, but just a very small number and maybe not a very visible number. So that gave us a lot of food for thought in terms of how to structure and narrow this vision into something that's realistic. The third quadrant looks at the traditional functions, again, the pricing, valuation and so on, for new users -- not the life and health and employee benefit areas, but health care industries, financial services and other industries. And here again, at least in the health care and other financial services areas (other financial services perhaps being banks, thrifts, stock brokerages, investment advisory firms and so on), there's a strong sense that there is tremendous opportunity for us to take our traditional skills and apply them. Less so as we get into industries beyond financial services. Finally, we get to the new functions for the new users. Here again, when you start to get into strategic planning, corporate finance, and investment management, there is tremendous opportunity if we have those skills across a broad variety of businesses, including businesses, beyond financial services.

What are the implications of all of this for the actuary? Obviously there are implications on both sides of the ledger: one side being for the actuary, the other side being for the profession. As we go up from students and actuarial students to the recent fellows, older fellows and so on, there's a different set of issues that come up. For the student the obvious issue is if the profession is appealing. How do we make it appealing? There's this vision of the actuary of the future. How do we characterize this in a way that appeals to the students and how will the students who we want to attract be different from the ones we've attracted in the past? How do we structure our communications, including exam booklets, sample exams and so on, to attract them? For years we always gave high school and college students sample exams of Part One and Part Two. It's tough to tell somebody when they have an algebra or calculus exam and a probability/statistics exam that we're conceptual managers and there's a lot of management functions in what we do. I suspect in the future that we will develop something that suggests both mathematics and the management aspects of

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Academia	Private Industry Business	Other Financial Service	Health Care Industry	USERS			Insurance Industry Property & Casualty	Insurance Industry Life	Opportunity/Needs	
				Government	Private Industry/ Employer				*	+
FUNCTIONS										
		+	+	+	*	*	*		Pricing/Funding	
		+	+	+	*	*	*		Product/Benefit Design	
	+	+	+	*	*	*	*		Valuation of Liabilities	
	+	+	+	*	*	*	*		Solvency	
			+		*	+	*		Legal/Regulation Compliance	
			+		+	+	*		Tax Strategy	
	+	+	+	+	+	+	+		Valuation of Assets	
	+	+	+	+	+	+	+		Strategic Planning	
	+	+	+		+	+	+		Product Management	
	+	+	+		+	+	+		Underwriting	
	+	+	+		+	+	+		Risk Management	
	+	+	+		+	+	+		Corporate Finance	
	+	+	+		+	+	+		Investment Management	
			+		+	+	+		Investment Analysis	
						+	*		Information Management	
									Claim Management	
									Marketing	
									Sales	
									Administration	
									Communication	

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GRAPH 1

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what we do with the mathematics. As we go up, the more recent fellows have to assess their current skills and needs and get an idea of what they'd like to be doing in the future, what now fits into the picture and what they need to do through continuing education or other training. Of course, as we get up to senior actuaries, I suspect there will be more professional involvement and concern about some of these issues. Hopefully, we are providing reasonable role models.

Finally, what implications for the actuary come out of this kind of analysis and come out of this task force? Basically, what it comes down to is we need to be and we need to be perceived as being managers as well as technicians, advisors as well as calculators, conceptualizers as well as mechanics, persuaders not just analysts, futurists not just extrapolators, communicators not just mathematicians. If you look at the right side of that you start to get a characterization of the stereotype that Fred was talking about. You look at the left side and you see a much different dimension of the three dimensions that we started talking about. What skills do we need, what businesses do we want to do them in, and what kind of perspective do we take in putting that all together? You can see there's a much broader perspective being applied. It's not going to change the fundamental core of what we are as professionals, but look at it in a little broader light, look at the businesses that we serve in a broader light. That's consistent with what we're good at or what we should be good at.

What I guess this all comes down to is that we need better communication skills, or at least be perceived as having better communication skills. We need more strength in areas like visualization, direction setting, and strategic thinking. We need to maybe think more about the business forest and how it relates to the actuarial trees. Think not so much about just analyzing things, getting right answers, but think about how we need to portray the results to make decisions. What alternative results can be impacted and how can we change things? Finally, this ultimately comes down to assessing what our professional responsibilities are as we change the vision of what we want to be and the objective of the profession. Each of us as individuals needs to start rethinking the kinds of principles that underlie this profession and the professional organization, and what kinds of standards we need to set. For example, in corporate finance kinds of thinking or strategic kinds of thinking, I don't think our literature right now has focused on standards there.

One last comment. When talking about what skills actuaries need to have, Roy Anderson, a futurist, said something a couple of years ago that I think is right on. Somebody said, "How do you expand your science?" He responded, "We need more art, we have all the science we can handle." That comes through here. It reminds me of our motto, "substitute facts for impressions." Some of this suggests we ought to substitute impressions from facts as well.

MR. MURPHY: We looked at implications for the profession and I'll take you through those briefly and then show you some of the ideas we received from our own thinking and responses to questionnaires, etc. I'll also tell you a little bit about what we did in terms of our report and recommendations to the board and then open it up for some questions. Relative to the profession itself, there are several areas where implications were seen by the task force. First, in basic education, there is a continuing need for training in basic skills as well as some new skills and a need to instill a broader perspective through the educational process. Often I find new Fellows coming out of the system having this great sense of being able to get the right answer. There is no right answer and they

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need to learn that sense of perspective. There are different viewpoints. The actuary, if he is going to be successful in the future, is going to have to be able to deal with the other viewpoints that come to the table on various problems as well as purely technical problems, and recognize there is no one right answer to many of the problems we have, particularly the ones that become more unstructured.

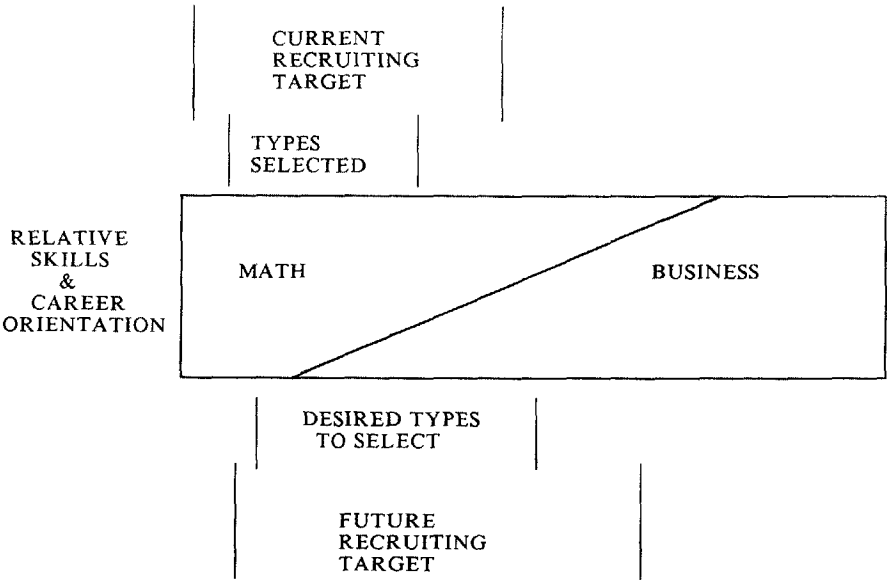
We have a great opportunity in our FES/FEM (Flexible Education System/Future Education Methods) system for the basic educational process which I think we can build on to create an educational environment that will be good for preparing actuaries for the future we see. We need to recognize, and this is already happening to some extent, more of the impact that our basic education has on recruiting new professionals to our ranks. In the area of continuing education and new skills, how can we make training available to the actuary? We think that as the future changes there's going to be more focus on the questions: where am I, what am I doing and is there some new direction I need to go in? Is my area an area of decline? Do I need to go down a new path in the middle of my career? Continuing education can be a source of retooling the actuary for changes in career direction. We not only have to provide some continuing education but we must also provide information about where to get the types of continuing education that perhaps we aren't best suited to give.

The whole area of public recognition of continuing education will be an issue. In the area of research, the SOA and the profession as a whole are doing a lot of good things but we need to keep doing more. It's the new ideas that come out of research that really provide the foundation for the profession. We need to communicate those new ideas both inside and outside the profession. Bright people are attracted to dynamic professions where new ideas are being generated. With those new ideas we develop a good reality base for the image we need to project through our public relations. Public relations has to look at all the various audiences that are important to our profession: potential actuaries in the recruiting area, potential employers for our successful recruits; current actuaries and their understanding of the direction of the future; public policy makers as both Fred and Bob have suggested. Obviously, working with those audiences will help build a stronger image of the actuarial profession.

The public interface role is clearly important for the profession. Improving recruiting and selection is probably the most important area, and several of the other areas will have an impact on that. If you view the rectangle in Graph 2 as a picture of a wide spectrum of people with varying relative skills in math and business and relatively different career orientations, we move from one side to the other with people who have virtually all math skills but not so many business skills to some balance of the two over to the other end of the spectrum where you have very, very good business skills but no math skills at all. However, I think in today's environment a businessman with no math skills is not going to make it very far. We view the current recruitment methods as emphasizing the math skills and not the business skills at all and we tend to select, as a result of that, people with more of a math background. We think that for the future, recruitment needs to be expanded, the target group needs to be expanded. It doesn't mean we take away from our target group people who have a good solid math background. We need a solid technical background for this profession to continue to grow as a scientific profession. But, we also need to attract more people in the profession who have business-oriented skills and can still do and apply mathematical methodology to the problems we have. We don't even test for math that much, although sometimes people looking at the Part One

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GRAPH 2



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course may think we do. So, we see an expansion of the target group for recruitment and not necessarily a change.

As I mentioned, there were a number of ideas that we got from several sources. I thought I'd briefly tell you about some of them. We did not evaluate them all. These are just some ideas in some areas that might help the profession move forward in the future. For example, the investment risk area is becoming more important. We should develop an investment track as part of our fellowship course and I know the committee has been thinking about that and is, in fact, working on it. Perhaps we should incorporate both math and nonmath elements into Course 100, the first course which is often referred to as a recruiting exam. We should develop a technical track for those with that interest and cut back a little on the mathematical content for the other tracks. This is not to take away anything important, particularly anything like contingencies and statistics. Maybe that's another way to get the balance we need in the profession. Revise materials about the Education and Examination (E&E) process to recognize the public relations and recruiting roles. Anybody who's recently been through the new exam system or looked at it would probably go along with developing a simpler description of FES/FEM. Other E&E ideas focus on practical aspects and unstructured as well as structured problem solving in the E&E structure. Maintain the strength of a technical math background. We got a lot of this from a lot of respondents both within and outside the profession, that we should not let go of our technical roots. That's very important. Drop the prize for Course 100. We're giving a wrong message when we're giving away money for doing well on that exam. At least that's what that idea suggests.

In the area of continuing education we may need a publicly recognized program. We need courses for retooling and new specialties. With regard to investment-oriented continuing education, one of the outsiders was very concerned about getting his actuaries up to speed on investment finance, theory of markets, etc., because he would much rather use his existing seasoned actuaries in some of the high-level financial negotiations that he's going through. His alternative is to train his investment people in mathematics and statistics.

We need to improve communications to nonactuaries, translate our jargon into something that others can understand. Public issue forums would bring together actuaries and others who have an interest in various public issues to discuss them. Perhaps the AIDS symposium did a little of this and we need to do more of that kind of thing. We need more programs like the well-attended session on negotiation.

We also need public relations ideas: build relationships with other associations. Get them to know us, us to know them and perhaps they'll come looking to us for help on common issues. Develop materials that showcase successful actuaries as examples for recruiting. I saw a sample brochure for minority recruiting at a recent board meeting and it does just that, from the minority perspective. We should do something like that for the total audience as well. Use focus groups of various audiences to determine a perception of us and test possible materials for public relations efforts. Organize career days with participation by volunteers from the profession visiting high schools and colleges, but develop a strong organized program for doing that so we can get to more areas. Build awareness among public service employees and politicians; I guess that's going to be my new job along with a lot of help from a lot of volunteers in the profession. Become a well-known source of data in current and new areas of practice

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so that when governments are looking for something they recognize and remember, "Oh yeah, those actuaries can help us with that." So, that's a set of some of the ideas we got.

We made a number of recommendations to the board flowing out of the material that both Fred and Bob have talked about. We developed a mission statement and statement of intellectual core, which we thought should become the basis for work in the profession. The mission statement reads something like this, "To be and to be perceived as being the financial architects and potential managers of enterprises both public and private that are built on the intellectual core of the actuarial profession." The intellectual core might read something like this, "The application of experience, analysis, and risk evaluation to measure, communicate, and respond to the current financial implications of future contingent events," which is essentially the formula that Fred discussed. We recommended that the Society communicate the efforts of our task force both with our own membership but more importantly and more quickly with the key committees, the working committees of the Society. Have some brainstorming sessions to plan what it is those areas can do to advance the future of the actuary. Meet with E&E, meet with continuing education, meet with public relations committees. There are a number of committees that are within the SOA and other organizations that can do some of these things. We also suggested that we really are playing with a topic that is a profession-wide topic, not an SOA topic. It's important to get discussions on this issue going on a profession-wide basis. There's an organization which some of you may know of called the Council of Presidents. It's the father or mother of the task force on strengthening the profession. That council should discuss the issues we've put together in the "Actuary of the Future" report and perhaps do some of the same kinds of things on a profession-wide basis that we've recommended to the committees of the SOA. It's the whole profession that, hopefully, has a future. Whether it be casualty actuaries, pension actuaries, future investment actuaries, what have you, we need to work together on that. I think that's enough of a presentation. We'd appreciate any comments; hopefully the ideas have presented some food for thought.

MR. PAUL A. CAMPBELL: I've just completed a study and developed a recruiting program for the University of Hartford, which has a new undergraduate actuarial science program. I'd like to add to the matrix that you were discussing toward the end, Jim. My plan is going to be to focus first on the guidance counselors and teachers, educating them as to a broader perspective of what the actuary is. Then, I intend to focus on the small handful of people in the high schools who are the most appropriate candidates and do the same thing at the related schools in the university, such as the computer school, the engineering school, and the arts and science math majors. Those are the sources of people, but we must keep in mind that they're not huge in numbers. The education, I believe, needs to begin at the guidance counselor and teacher level as opposed to the individual level.

MR. WILLIAM C. CUTLIP: We do have a new committee now in the Society on management and personal development; in fact, we've worked very closely with what was going on with the "Actuary of the Future." But, what we're looking at with this group is a target audience that falls along the lines of the spectrum that was discussed, with technically focused Actuaries, business focused Actuaries, and business people who happen to be actuaries. This committee on management and personal development is beginning to look at ways to meet the need of actuaries within this spectrum. Our first thrust has come through some of the programs that you've seen at the Society meetings. Paul, in fact, did one

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at this present meeting on how to use business judgment. There was also one on how to be an effective manager. We're starting to get these kinds of programs through the program sessions. One question I would like to address to the panel, if I may, relates to the reaction from the board as to how much of this the board sees as a responsibility of the Society, and how much of it is recognized to be things that actuaries need to know but things that the Society won't be developing.

MR. MURPHY: I think it's probably a mixture. We did not spend a lot of time on that per se, but I think there's always been a feeling among the board that while we should do and can do more, we also should recognize that actuaries don't necessarily know how to do everything that they ought to know how to do and that there ought to be some use of outsiders and some development of alternative routes toward continuing education. Gary even alluded to it in his presidential address, I think, that we can do more than we thought we could. The kind of stuff your committee is doing is that kind of stuff, and I think there is general support on the part of the board to support those activities, particularly since the membership is supporting those activities by attending them.

The board accepted our report. They're establishing a follow-up task force at a higher level than we were. That task force will follow through on the recommendations to work with the committees, particularly focusing on the recruiting area and basic education. Gary also is going to take on the responsibility of communicating our report with the profession through the Council of Presidents and seeing where it can go in terms of discussion and possible activity on a profession-wide basis.

MR. CUTLIP: As Fred said in his remarks, actuaries are the ones who are defensive, so I will be defensive and take umbrage at one of your comments, and that is describing softer skills that are needed by actuaries. I think that's a point that is extremely important because we have for so long felt that the technical pieces were the things that we had to have, that the art was not important, that the liberal arts were not important, that the technical was important. And, of course, what has just come out through the studies, through the responses from people is that, in fact, we are looking for communication skills, we are looking for managers, we are looking for conceptualizers and so on. I think we need to begin to think about those as hard skills and ones that we need to focus on in the way we have always focused on the other hard skills in the past.

MR. JEFFREY D. MILLER: I'd agree with what you said about the soft skills. We have the same problem in our firm when we talk about client time and soft time, and we have to change the ways in which we talk to each other. Defensive, arrogant, work too hard -- those traits really hit home to me and, in fact, I agree with them. I've encountered them as I've tried to participate in this oxymoron called "Management of the Consulting Firm." I guess I would ask you what the various task forces and committees are thinking about doing to address those personal characteristics of many actuaries.

MR. KILBOURNE: The selection and recruiting process that we, the actuarial profession, have used over the years has tended to seek and find people who are very technically competent and that's good. But, perhaps it has tended to discourage those who are technically competent but also tend to have some of these other skills that are so talked about now. Bob and I were kidding earlier

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that one of the suggestions was doing away with the prize for Part One to the person who got the highest score. I said, "Well, perhaps we should give a prize to the person who got the lowest score." Then, he suggested that it should be the prize for the person who got the lowest passing score. So, selection and recruiting should focus more on somehow trying to pick up the people who would have some of what we may be short on calling business skills without at the same time, of course, sacrificing too badly on the technical skills which are required, because the foundation, the heart of our profession, is technical, at least to a considerable extent. I'm not even sure that all of us are arrogant and defensive, but we might appear that way. We appear arrogant because we have all this jargon and create this black box around what we do. Because of that we don't communicate very well and I think we often appear arrogant to our associates as they see us as keeping that black box to ourselves because we say to them, "You know, you wouldn't understand this. We are actuaries; trust us. You can't do this." I suspect that if we unveiled our black box and made information understandable to nonactuaries, the apparent arrogance would disappear in some cases. The defensiveness I suspect is real. I've only worked in insurance companies so that's all I can relate to. But there we've watched our companies go from being organized functionally where the road to the top was the road to Chief Actuary to all of a sudden being organized where the road to the top is to run a business. All of a sudden we don't have the role models and the training and the experience that gets us up that ladder as easily. I suspect a lot of it is just that we get frustrated and get defensive about it and we probably do need training there to just understand our role in a different kind of organization.

MS. STEPHANIE CROGNALE*: I'm an outsider looking into your industry. I'm not a Fellow; I'm not an actuary. But, I sell to the actuarial community, and I used to sell data processing consulting services to insurance companies. When I'd go into insurance companies' data processing departments I'd hear things like, "Those actuaries, they always do their own thing." We had a class to teach project managers, and the joke that got the biggest laugh was, "Well, I know none of you in here know what actuaries do but we all know every time they pass an exam they get a raise." That would bring the house down. I've been at the show for four days now, and what I realize is that the services you provide and the data you keep in your tables and in your head and on your data processing systems are probably some of the most valuable resources in the company. I think the National Institutes of Health would give their eye teeth to know how the public should be living. I've gone into the mall with this badge on and I've had people say to me, "What is an actuary?" And, of course, I'm not one so I try to explain my concept of an actuary since I have to sell to actuaries. I've said, "Well, an actuary determines your rates." "Oh, you mean they're the ones that tell me if I drive a red sports car I'm going to be paying a lot?" I said, "Well, yeah I guess that's what an actuary does." I'm talking to life actuaries this week and they said, "Well, can they tell me what I can do better to live longer?" I said, "Well, absolutely. They have that data." I have a daughter in college and she's determined to go into business and I can't wait to get home to tell her to take a look at the actuarial profession. I really feel you have done quite a service. I think maybe by design you've done yourself an injustice within your own corporations. Putting that box around yourself.

* Ms. Crognale, not a member of the Society, is a Sales Representative of STSC, Inc., in Rockville, Maryland.

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Data processing people do that as well. I think you have to rely on technology. You have to rely on computer technology for sure, especially in the future. Having any antagonism with your data processing department is certainly going to hurt you as well as them because I think there's a lot of things that you both could lose. I've seen it for six years now and I like the direction you're headed in.

MR. ALLAN J. WALTON: I have a question for the panel on future employment opportunities for actuaries. You said earlier, I recall, that about 50% of actuaries worked in insurance companies, 45% in consulting firms and then another 5% in academic and other endeavors. I know that's only a sample for 100% but in Canada, where I work, I know there are at least 1% in public service and 2% who work for other employers. These are people who work for large corporations. They work doing financial planning; they work in the benefits section and do actuarial jobs in noninsurance companies for consulting firms. I wonder if you saw that we can acquire business skills to possibly expand in the future so this area would encompass up to 5-10% of the future employment opportunities.

MR. KILBOURNE: Well, I'll give a try at that because I happen to feel that the potential for actuaries to provide actuarial services in industries that are outside the financial service industry and in government is such that if we are to adequately serve the public needs in those areas well over 50% of actuaries will be working in those areas at some time in the future without any absolute diminishment in the fields that we're already providing services to. To me this follows from the idea that we are people who are needed when risk and money are involved, which certainly goes beyond just the financial services industry. I don't contend at all that actuaries are skilled in construction. But what we are skilled at is quantifying future contingencies and dealing with the financial consequences of those. If we are able to represent that to prospective users of our services in such a way that they start using us, I think that there's a good opportunity for us to have a majority of the members of the profession working in the areas that you referred to as early as in the next century.

MR. CHARLES BARRY H. WATSON: I guess I'd like to go back to the question that was raised by Mr. Miller. He was talking about, as I understood it, a problem in terms of dealing, involving, and managing actuaries within the overall concept of the firm and there was an answer given to this by the panel but I, perhaps, interpreted it slightly differently and with some degree of concern. It has always seemed to me that one thing that actuaries can and should bring to the organizations where they are working is a degree of creativity and a degree of independence from the prevailing mores of those industries, which, at least, within the life insurance and, I would imagine, the property/casualty insurance business, has been one typically of selling coverage. I think also that this carries over into consulting firms. Certainly within our firm I've seen that the people who contribute most to the firm are the ones who are creative and who are probably the least interested and least involved in the typical management aspects of the business. I think that if actuaries are led to believe that we should become super-colossal managers it can only be to the detriment of the skills that we do have and to the contributions that we can bring not only to our profession but to the people and public whom we are trying to serve. Therefore, I think that we need to be careful in terms of emphasizing the expansion of our education, of our involvement into these areas because there's a danger that we will lose the baby and become not quite good enough to get the bath water. I also wonder if in the drive towards continuing education, and this is along the same line, whether we are trying to teach through the actuarial

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field and the actuarial profession subjects that are much better acquired elsewhere. The education of the actuary as an actuary cannot encompass everything and I think that we still do need to emphasize our technical abilities because that is fundamentally what we are called upon to use. That's what we're ultimately getting paid for and everything else is an enhancement, but it is just an enhancement.

MR. MURPHY: I want to make one comment relative to that. I think you may be right about criticizing a potential over-emphasis on the word management and management skills. One of the things I think we've been doing throughout this process is struggling with the right terminology for just what it is that those, to use Bill's language, additional hard skills ought to be beyond the traditional ones. I think maybe a better word might have been leadership. We've used the word business skills. We've talked about management. Sometimes we're just better off listing skills we're looking for. When I think of leadership I certainly think of creativity. So maybe we need to look at just what we mean and define our terms better as we work on this, but we're all concerned and we don't want to swing the pendulum all the way the other way and make a mistake in that direction as well.

MR. SHAPIRO: One way to look at it might be how we package the technical skills. I remember when I took the exams, there was an exam on algebra and statistics, and then one on contingencies, one on accounting, and one on law. It was all functional. When I got done, I didn't have a very good idea of how it would all fit together. I figured that it would come with time. I think one of the things that would come out of this is a clear idea of what this is all about and how these things might fit together. So then maybe the exams would be structured differently, not so much by function but by business. The administration business, the risk management business, the investment business, who knows? But I think it's more packaging than anything else and I agree we've had real trouble figuring out how to get these concepts in there in a way that doesn't suggest that management is something distinct from technology, something distinct from creativity.

MR. KILBOURNE: I'd like to second Barry's concern and I think we need to have a subroutine in all of the changes to make sure we're not throwing out the baby with the bath water. We don't want to lose the technical excellence that has characterized the actuary and which is a good part of the reason for our success as a profession, while at the same time trying not to be confined to some back room where somebody else has to interpret what we've done.

MR. CUTLIP: Part of the concept we're using in our education process has two aspects. One is that we have brought some people into the programs who are not actuaries to help teach some of the basic skills. The second approach that we're taking with that is to recognize whether actuaries are actuaries because they're technicians or they're technicians because they're actuaries. I'm not sure which is the chicken and which is the egg, but I don't think it really matters. The actuarial thought process is a very logical step-by-step process. The way that we're trained capitalizes on that process so that you reinforce the thinking process, the problem solving, and the analysis, and you're training some of the additional skills in this step-by-step process.

MR. JOHN J. LIBERA, JR.: I think I agree with all of the kinds of additional skills that you identified as being absolutely necessary for the future and I don't want my question to seem to detract from that at all. As actuaries we

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would be expected to be aware of things like business cycles and to account for those but not to try to change them nor to assume that they would continue forever. My question is, in the task force, have you done any studies on such things as management cycles? There are cycles that businesses go through. I think some theories of complex organization would call for organizations changing every so many years no matter what. Might we be in a time where some of the technical skills which have been in the front in the past are now in what would be a traditional kind of trough in the cycle?

MR. MURPHY: I don't think we specifically looked at that. I think it's an interesting idea. I'm trying to think backwards in time to what history I know.

I don't know if I see that cycle having taken place in the past necessarily, although, we do have innovative new techniques developing periodically and then we discover we've got to manage those techniques, and things can change directions. It's something maybe worth thinking about.

MR. LIBERA: I don't want to imply that I know one way or another. It's really just an open-ended question. But, I think the reason for asking it is obvious: if we're going to start changing things in our education program, we'll want to make sure that we put the proper perspective on what it is that we're changing and why it is we're changing. That keys into something else I think I'd like to comment on. A comment had been made and I talked to some other people at one of the earlier sessions about this idea of introducing some of these additional skills into the syllabus in one way or another. The comment I think is always made is that some of these other skills can be better taught in other kinds of forms and that's true, but it's probably also true about everything that we teach in the current syllabus. The important thing is the overall message that we are giving, not just to the people who are going to be employing actuaries but to actuaries and potential actuaries themselves. So what it is that you send through the syllabus helps actuaries identify themselves and helps put a perspective on the broad range of skills that are necessary, even though any one of them may not be learned best through that program itself.

MR. MURPHY: I think you hit on something very important there and when we get around to talking to the E&E committee and people related to that area it's important that the syllabus be looked at as a recruiting piece as well as an educational piece. That is what the people look at in determining what we are and whether they want to be one of us. "This is how I become an actuary, this is what I learn to become an actuary. This is something I want to do." It's important to keep that in mind. That doesn't mean that it should become the dominant basis for the education system. I guess Bob's term of packaging again applies. It's one thing to put out a little preliminary exam booklet with an integral sign on it with Parts One and Two inside of it; that says one thing. Then I see this brochure, as I mentioned before, for minority recruitment that includes some presentations or discussions about some successful minority actuaries. You can extend that and give a different kind of message. Now those are two extremes, if you will, but any process probably needs to find something in between in terms of what is available. I think FES/FEM will give us an opportunity to do a little more with that than we had with the old pure exam system. Maybe we can talk about what the tracks are and things like that to give people a broader picture of an actuary rather than just seeing a step-by-step series of exams. They'd see a track that's leading somewhere.

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MR. JAMES G. MASICA: I've always thought of the actuarial profession as basically rooted in the sciences rather than in business or finance and I've always looked at the actuarial syllabus as consisting basically of two parts, one of which deals with the use of mathematical models to optimize decisions and the other which instills enough factual information about insurance or pensions or some other field to make that model in that area useful. I think you could eliminate the second part of it, the factual information, and still have something that looks sort of like an actuary. But I don't think you could eliminate the first part and say the same thing. You'd have something that looked like a super-charged Fellow of the Life Management Institute (FLMI) or something. I guess what I'm aiming at would be to preserve the technical aspects of the profession, the scientific part of it, and find other areas not related to financial services where the same models might be useful. Has there been any significant thinking in those directions?

MR. MURPHY: I think a lot of what underlies the vision matrix is in that direction, although I think we do believe that the technical grounding is absolutely necessary. Both the outsiders and the insiders said, "Don't give that up. That's what makes you what you are. But, if you're going to be successful at it you've got to be able to talk to us, you've got to be able to tell us what it is you are proposing to do, etc." So we do need to work on those other hard skills in one way or another or our actuaries will not be able to expand into other areas and apply the technical knowledge that is very basic, really. It's not life insurance or casualty insurance, it's applied mathematics. Model building is a good example. I like what I hear you saying about the way you envision our education process and what it does. I wish that view was presented to everybody who looks at it because I think that's sort of what we're looking for -- to be perceived as you perceive it -- with a little more, maybe, emphasis on the bigger pictures and broad perspectives. I think you're right on. Just like everybody said, "Don't throw the baby out with the bath water." We've got to keep everything in perspective. That's the important thing. We must do that. There is a perspective that we've been ignoring in the past and we need to put some resources behind for the future.

MR. DAVID L. CRESWELL: I think in looking at actuarial work as having a scientific basis we need to be careful that we realize that that is our background but that is not where we need to be. I know people I've talked to who are scientists, who work in the hard sciences, who tend to have very much bias regarding irrefutable proof. I think as actuaries we need to be willing to give educated guesses and that is what our actuarial background should provide. The emphasis is on the educated. But the people in management are not going to be willing to wait until we have irrefutable proof because their job is broader than that. I've discussed these things with people who work as scientists. There's an unwillingness to do that; it's almost like impinging on their professional ethics. I think that we need to certainly be careful that our training doesn't put us into a similar frame of mind.

MR. MURPHY: We're very much a practical profession, one that practices from a scientific base. I think you're right, we've got to be careful. I think there's been a little too much emphasis on the scientific base and not enough on the fact that it's a practical practice that we undertake, which is different than pure science. Someone said earlier we need the art side as well as the science side. I think that's another good analogy.

FROM THE FLOOR: Should we recruit at art schools?

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MR. MURPHY: I would think that there might be some good actuaries who come out of art schools. That's possible. I tend to find the liberal arts majors will probably end up having a better chance at success than the math department/actuarial program based majors. The business department actuarial program majors have a little better opportunity. But sometimes the math majors from the liberal art schools really have a perspective from that broad education. That is more the kind of thing I think we're looking for.

