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THE FUTURE OF THE ACTUARY/ THE ACTUARY OF THE FUTURE

NOTE: The written record of this session is based predominantly on the presentations made at the Boca Raton meeting (June 8-10, 1988) and is published only in the Boca Raton *Record*, Vol. 14, No. 3. Because the topics of the final presentations at both the Anaheim meeting (April 13-15, 1988) and the Louisville meeting (May 16-17, 1988) significantly departed from the final presentation in Boca Raton, they are included as well. Questions asked at all three sessions are published in the Boca Raton *Record*. Each session had different moderators and panelists.

In Anaheim, the moderator was Edwin F. Boynton; panelists were: Edwin F. Boynton, Gary Corbett, and James J. Murphy.

In Louisville, the moderator was James J. Murphy; panelists were: Phyllis A. Doran, James C. Hickman, and James J. Murphy.

In Boca Raton, the moderator was Robert D. Shapiro; panelists were: Kin K. Gee, Harold G. Ingraham, Jr., and Robert D. Shapiro.

Recorder for all three sessions: Cara M. Yankus*

- o A discussion of the current and future roles and functions of the actuary, including the types of skills and knowledge necessary to cope with the changing business environment. Presentations highlight:
  - -- Background and history of the topic.
  - -- Task Force assignment and basic plan of action. (The Task Force on The Actuary of The Future will report its findings at the Society meeting in October 1988.)
  - -- Vision matrix, featuring functions and users of actuaries.
  - -- The importance of promoting actuarial research, along with past, present, and future issues in actuarial theory.
  - -- Responses from and a summary of a recent survey on the actuarial profession in general.

MR. HAROLD G. INGRAHAM, JR.: Let me open this discussion by presenting some background information in historical perspective. To formulate rational recommendations on how best to position ourselves for a likely future, I think it's essential that we understand where we as a profession have been, and that we identify those forces of change that have been modifying the role of actuaries since I entered the profession over 30 years ago. There is a perception shared by a growing number of my actuarial peers that actuaries entering insurance companies in more recent years have not been as successful as were their

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previous actuarial counterparts at comparable stages in their careers, measuring success by position and relative salary level. Three reasons have been set forth for this relative downgrading in rank, responsibility, and importance within these companies: (1) There is considerably greater competition for management positions than there used to be. (2) The requirements for career progress and success in companies have changed, but too many actuaries have not adapted and responded to these changes. (3) Many younger actuaries, although technically quite competent, are less skilled in the elements leading to success in today's management.

Until recently, insurance companies were mainly structured on a functional basis. The position of chief actuary was traditionally one of the most important in the company, in many cases second only to the Chief Executive Officer (CEO). Typically, it was a springboard to becoming a CEO. Not so today. The basic change today has been the move within companies to organizations with strategic business units (SBUs). Corporate actuaries with no product design or pricing responsibility more often than not report to a chief financial officer (CFO) possessing an accounting or investment background. In such a structure, the corporate actuary is often the only senior actuarial officer in the company.

Now, what happens to the capable and creative product pricing actuaries in a company that buries them in SBUs, some quite narrow in scope? Well, their obvious promotion track is into the management of the SBUs. But not many such actuaries appear to be emerging into this kind of management position. Some are not because they prefer technical roles. Others aren't chosen because they are perceived to lack management skills. More significantly, the competition for these positions increasingly is business school graduates, MBAs, who have been exposed to management and marketing concepts.

Similar trends have also surfaced in the employee benefits area. Recent developments in flexible benefits have been spearheaded by benefits and compensation consultants who more often than not are not actuaries. For all of these reasons, since the early 1980s the Society's Committee on Planning has been focused on identifying ways to enhance the value of the Fellow of the Society of Actuaries (FSA). They developed the argument that the changing environment in the business world in which actuaries are employed, as well as other social and economic changes, will result in a shift in emphasis in the skills necessary to become a successful actuary in the future. The Committee on Planning noted that there may be a declining need for actuarial skills in certain areas in which actuaries have traditionally practiced. However, they also struck a positive note in that they observed that we have an opportunity to broaden the scope of actuarial skills; in other words, to utilize more fully our unique education or training. In 1985, the Committee on Planning presented a report to the Society's Board. I'm going to quote briefly from some of their conclusions.

> FSAs have been trained to use a unique actuarial knowledge and established techniques to solve one-dimensional, well-defined problems where there is a correct or optimum solution. But the major employers of actuaries -- in other words, financial institutions and sponsors of employee benefit plans -- today often face broad, ill-defined situations in which the problems must first be identified and then addressed, often in innovative ways, effectively using interdisciplinary teams.

Another quote:

> Actuarial training does not uniquely equip people to deal with these situations. In fact, training in business administration or economics may provide a more reliable starting point than the selection and education process which produces FSAs. In a world of increased change, actuaries as a group need to increase their abilities to deal with change. We need to get better at problem identification and dealing with unstructured situations. Above all, we need to improve our communication and presentation skills, both written and oral, particularly with other non-actuarial professionals, non-professional businessmen, and laymen. For future members, we should increase the emphasis on selecting and training for these skills.

Well, the Society's Board essentially endorsed the conclusion of this report. One key concern, however, was that the Society's membership in general either didn't know or didn't agree that there was a problem regarding their futures. At this point, the Society's leadership -- in other words, the Board and its Executive Committee -- believed it was important, imperative even, to establish and broaden communication with the membership. We started to do that through various dialogues and sessions like this one.

In 1986, the Committee on Planning commissioned the Actuarial Profile Survey, which I know some of you filled out and that was sent to everybody in the Society. The survey was intended to find out how important the membership viewed various skills and what actions they had taken to develop those skills. On the whole, respondents reported satisfaction with their professional success, with 86% saying that their success met or exceeded their expectations. Clearly, their expectations were part of the problem.

In 1987, the Committee on Planning shifted its focus from the Value of the Actuary to the Actuary of the Future, which is the title of this session, and it's going to be the title of Gary Corbett's presidential address this fall. One of the reasons for shifting that focus was to express this issue in a more positive manner, a more unbiased manner. The May 1987 special issue of *The Actuary*, a report and commentary on the Actuarial Profile Survey, contained a number of thoughtful articles on this very subject. However, our efforts to provoke the membership and attract attention to these issues produced a grand total of four lonely responses.

During 1987, the Committee on Planning also worked for the Public Relations Committee and Career Encouragement Committee to revamp the Society's recruiting material. Now, more emphasis has been placed on the need to recruit people who are stronger in the non-mathematical attributes I mentioned earlier rather than focusing so much on the purely mathematical skills as has been done in the past. The intent is to appeal more to that group of people with reasonably solid math backgrounds who prefer to use their mathematical skills as a door opener or leverage to develop a broader-based business or professional career.

Also in May 1987, the Committee on Planning held a special meeting with a number of actuarial thinkers participating, such as Jim Anderson, Roy Anderson, Fred Kilbourne and Jim Hickman; all, in my opinion, are strong futurists. Some of their observations at that meeting were these. First, the principal areas of actuarial employment in the past have been individual life insurance and defined benefit pension plans. Both of these areas, for somewhat different reasons, are now experiencing some degree of stagnation and shrinkage. In these areas, there could be reduced demand for actuarial services in the future. One of the

major problems for a learned profession is to adapt its structures to cope with rapid change. The changing environment is shifting the emphasis on the skills that the actuary of the future should have, but it's an opportunity as well as a problem. They went on to say that some new areas of actuarial activity should include things like these: analyzing the implications of exposing assets and liabilities to interest rate risks, estimating the cost of prefunding post-retirement health care benefits, and developing proper present value techniques for interest contingent cash flow streams consistent with the emerging theory of finance. They went on to say that if we don't respond to the environmental changes taking place all around us, then other professions may move into areas we could otherwise serve.

There's a need for actuaries to work closely with other professionals rather than just in an actuarial ivory tower. Many practicing actuaries come in regular contact with accountants, lawyers, underwriters, corporate planners, investment professionals, and so forth. They need to understand what those from other disciplines are saying as well as to be able to communicate actuarial concepts in these very different contexts in ways which lay people and other professionals will be able to understand.

The Committee went on to say there's not one actuary of the future; there will be many. We need people with interpersonal skills. We need a university-type Education & Examination (E&E) System with different areas such as life and pensions and casualty represented as separate schools. The content of our education must change. I'd say, parenthetically, that Flexible Education System (FES)/Future Exam Methods (FEM) is beginning to successfully address that very concept.

As an outgrowth of this meeting, the Committee on Planning formed a task force to focus solely on the Actuary of the Future issue, with Jim Murphy as chairman. The charge of this task force is "to study and make recommendations concerning the future role of the actuary, and the professional activities necessary to prepare and support actuaries for those roles."

Let me briefly summarize what I've been trying to put forth in these opening remarks. The Society's leadership is quite concerned about what appears to be a pronounced drift toward a diminished role for many members of our profession. And we're also concerned that the apparent apathy and resistance to change of many of the Society members may impede efforts to start changing the direction of the profession to cope with our rather dramatically changing environment.

MR. KIN K. GEE: I've been asked to say a few things about what the task force is and what it has been doing. As was mentioned, the charge of the task force is to study and make recommendations concerning the future roles of actuaries and professional activities necessary to prepare and support actuaries for those roles. This charge was actually boiled down from a fairly extensive resolution of the SOA Executive Committee. We're using this as a guide in our work.

Questions that are going to be asked of us are as follows. What will, should be, and can be the role of actuaries? What knowledge, methods, and skills will be required of the actuary of the future, and what are the implications of those issues for selection, education, training and research? Should the Society's education process, both basic and continuing, be expanded to include disciplines and businesses that are not currently covered on the syllabus? Should the

Society ensure that its members have actual skills in sciences that are vital to success, as well as communication and broad-based management skills? How should the Society communicate both within and outside the profession about the changing role of the actuary? And how should we modify the selection process to attract individuals who are likely to succeed as actuaries in the future?

We're going to be looking at these kinds of questions and many others. The task force has appointed Jim Murphy as chairman; Ed Boynton and Bob Shapiro are the two vice-chairmen. We also recruit and select members that we hope represent all segments of current practice in our profession, as well as some of those who are on the fringes, including for example, Jim Tilley, who is in an investment banking firm. We also specifically got members assigned to the task force from the Casualty Actuarial Society (CAS), one of them being the past president of the CAS and the other being the current chairman of the CAS's Planning Committee.

The members we selected have been very active either as Board members in the Society or other actuarial organizations. Some, like Jim Hickman, are from the academic community; we believe he will add a unique perspective on these issues. We also added people we think have futuristic ideas about the profession, as well as people who have thought about it for a long time and people like myself who haven't thought about it for a long time. Some older folks and some younger folks.

Our approach has been changed slightly, I think, from the past; the project was originally called the Value of the FSA, and now it is entitled the Future of the Actuary/the Actuary of the Future. That's what we're really worried about -- not so much that we're FSAs or that we're valuable -- but what we are going to be, what we will be doing, and what services we can provide as actuaries. We're taking a much more forward-looking approach to the problem than was taken in the past, even though the project stems from concern about what is happening today.

To do that, we're creating a vision of what the future might be. We're creating a two-dimensional matrix including possible users and performable functions both in terms of the current situation and future opportunities. We are looking into the roles that we currently have as well as potential roles that we could fill. We're going to try to look at the question, "What is the common core of knowledge that an actuary should have?" This question has been looked at a lot, especially by the E&E committee. But I think we can bring something new to that question by trying to identify where actuaries are and where they can go.

Then we'll get a feel for what it is that FSAs are and what makes us useful. There are roles we can fill for which we are uniquely trained. But there are also roles for which we're not the only people that are trained, but because of the training, we bring a fairly unique perspective to them. Some examples of functions that we haven't traditionally thought of actuaries doing may include calculating payoffs in state lotteries or perhaps setting a rate basis for utility companies. Our training, I think, makes us kind of unique for some of those applications.

Those are the kinds of things we're trying to identify. Then we'll take a look at what skills are going to be necessary for people currently in this profession as well as those who are going to enter the profession in the future, in order to move into these expanded areas. We hope to get input from you here at this

meeting. The discussions will help us to test the vision that we have and perhaps modify the vision before the final report. Also, we plan to get input from nonactuaries.

Bob Shapiro has gone through the responses that we've received. We've gotten quite a favorable response rate. He'll share some of the feedback that we've gotten. The input is going to be very valuable in helping us determine if the direction that we've been heading in is consistent with what other practitioners out there see and are concerned about. We'll be getting input from nonactuaries, or what we call "users," although they're not necessarily defined as employers or clients. They could be accountants and lawyers with whom we work, although on the basis of the responses that we've received, it is implied that the accountants may be our enemies. We'll have to see.

We're also probably going to pick a couple of executive recruiters. They have a good feel for the market, we believe. They have a sense of what the employers are looking for out there, and that could be a very unique perspective that we don't see ourselves. Our approach is to select some representatives of various categories of nonactuarial users or related people, and go out and interview them about what they see as right or wrong with the actuarial profession, where they see our marketability declining or increasing, and why and what they think might be necessary to see it increase in the future. It's interesting to note that the CAS had been telling us that they already did a little of this. They interviewed a number of casualty company CEOs; Mike Walter is one of the casualty representatives. He has shared with us some of the findings of these interviews.

I think the casualty people felt pretty good about their roles, and by and large are pretty optimistic about the opportunities from the casualty side. That doesn't mean that they'll just sit by complacently. They're pursuing this question as we are and we're glad to be working with them. As we get the input, we'll take a look at the vision, then put it together and modify accordingly. The real question is to identify what the implication of that vision is for recruiting purposes and the selection of new actuaries. We must also look at education, both basic and continuing, to determine what we should do in public relations and other promotional areas. We must do this at all levels, from potential actuaries to actuarial students to potential employers. Those are the areas that we think we need to look into and see what might be done.

MR. GARY CORBETT: (From Anaheim) The Future of the Actuary and the Actuary of the Future has been the subject of most of the talks I've given to local actuarial clubs this year. I have given twelve or thirteen talks on this particular subject. I generally offer them a choice from what I call the traditional club talk. The traditional club talk is what's going on in the Society, E&E research, those types of things. Most of the clubs have chosen the Future of the Actuary as something that they've wanted to listen to. Incidentally, it was also the subject of my recent address to the Institute of Actuaries of Japan. They were very interested about what was happening in the actuarial profession in North America; I expanded on it quite a bit. I was able to introduce the subject of the valuation of the actuary and a few other things in which they were very interested. The reaction of the clubs is interesting; as I talk to them, people don't always agree with what I say. Actually, a lot of the talk is devoted to what's happening to the actuary in life insurance companies and his/her decreasing role in management, particularly in large life insurance companies. As I say, people don't always agree with my characterization of the

problem, but I would say with one exception that there's a generally good feeling about the leadership of the profession addressing such questions. So, although there may not be any real concern, most agree that there are problems that we face, and that if we don't take some actions we will not maximize our opportunities in the future.

Now my talk is usually on what's been happening. In preparation, I was helped immeasurably by the fact that the task force has already prepared what they call their vision matrix. As we look to where we might expand the role of the actuary in the future, it seems to me this could take three forms. First of all, we can perform more functions for our existing users or employers. The second one is doing traditional actuarial functions, like pricing and reserving and so on, for new users that are not users of our services today. Of course, there is a third one which is new functions for new users. But I'd like to start by talking about the matrix that was prepared by the task force. What they did was to look at the functions and the users from two perspectives. Visualizing a two-dimensional matrix with functions going across the top and users coming down the side, the task force looked at each intersection for the degree of opportunities available for actuaries in the future. Was there going to be a need for actuaries to perform that function within that user group in the future? What is the degree to which that function is currently being filled? Obviously, what they're trying to identify are areas where there could be opportunities that are not being well filled in the present, but could be better filled in the future.

Current users identified in this study were the life insurance industry, the property and casualty insurance industry, employers primarily in the field of employee benefit plans, and governments. The traditional functions that we generally perform for those users would be pricing and funding, product and benefit design, valuation of liabilities, solvency, legal and regulatory compliance, and tax strategies. Now we're seeing significant opportunities in the future for all functions, for all users, except compliance and tax strategy for governments. Most of these we're seeing as being well filled currently. These comprise traditional functions for traditional users. There are other opportunities, but they are generally being well filled today. Now of course, looking to the future, we've got to make sure we protect our position as advances are made, as new things come out, for instance in the valuation of liabilities. You all know a lot of things are happening there with asset liability matching and so on; we will have to keep developing our expertise.

There are two areas in that matrix that are not being as well-served as they might be, and both of these were in the property and casualty industry in the compliance and tax strategy areas. Also in this category were employee benefit plans for tax strategies. So, these were three areas in the traditional part of this matrix that were identified as being areas which were not being as well-served by the actuarial profession as they might be. Then the task force looked at the existing users and asked, "What other opportunities are available for actuaries, for instance in life insurance companies, that actuaries have not traditionally filled?" And they went through the same matrix. Some of these additional functions were the valuation of assets, strategic planning, product management, underwriting, risk management, corporate finance, investment management and investment analysis. In all of those areas there was deemed to be a considerable, unfilled opportunity for actuaries. That extended into the life insurance industry, property and casualty insurance industry, and the employee benefits area, but of course, not into the government areas; in fact, there were limited additional opportunities seen in the government areas, except

in valuation of assets and strategic planning. Information management for property/casualty was identified as another area.

Now, what's more interesting are the new users identified by the task force; these include the health care industry, other financial services, private industry, and business in general. Now generally speaking, and I think I would certainly agree with this, the task force sees the health care industry and other financial services providing most of the same current and future opportunities as current users. That is, everything we do for life insurance companies today, we can and should do for the health care industry. I think that's without exception. There are very few exceptions in other financial service areas as well. In any of these industries, actuaries can play the same type of role they play in insurance industries and employee benefit plans.

Before leaving this subject of how we might expand actuarial opportunities in the future, I'd like to suggest there is another way of looking at this thing. It's not very different from the matrix. If you're looking to where actuaries might do things in the future they've not done in the past, it seems to me you get different answers depending on how you approach the question. One way to approach it is to look at actuarial science and say, "Where do the techniques of that science lead us? To what other areas can they be applied?" The second way is to say, "There is such a thing as actuarial science, but much of the success of the profession in the past has not been as related to applying that science as to becoming experts in specific industries, for example, life insurance." Let's just play each of those out and see where they lead. If you emphasize actuarial science, you start looking at the techniques that we use -- the ability to take future contingent events and put a value on them, a present value if you will. How can that be applied to areas that it's not been applied to before, even to nonfinancial services areas? There are areas like process control. There are areas like failure rates in manufacturing. Even weather forecasting has some of the same aspects to it. You're trying to put a value on certain things. For instance, you're trying to develop the probability of atmospheric conditions and the cost of that to different areas. The purpose here is to take a look at the techniques we use and see how they can be applied in nontraditional ways. I frankly don't think it's as good a way to look for where we might profitably expand as a profession in the future as looking at the industries.

I believe the main reason actuaries have been as successful as they have in the past has not been because of their knowledge per se of actuarial science, but the fact that they have become experts in the industries they serve. I mean, for years the actuary has been at least the technical expert in a life insurance company, in a property and casualty insurance company and certainly in employee benefits, specifically pension plans. Are there other industries closely related or perhaps not so closely related where actuaries could become just as expert as they are in insurance companies? The answer is yes; I think there are a couple. One is quite closely related to one of our current areas and that's the employee benefits area. I see no reason why actuaries could not become the experts in compensation, for instance. The actuarial profession would be trained in handling all aspects of employee compensation. I think that's a modest expansion of the actuary's role. The second is much more far-reaching; the industry that I am thinking of is banking. There's no single technical expert in the banking business. You have investment people. You have this and you have that. It seems to me that more and more, the technical abilities and our basic training could be used in the banking business in such things as asset liability

management and analysis of risk. Wouldn't regulators and even depositors welcome the quasi-fiduciary role that the actuary plays, that of somebody whose professional obligations transcend the making of profit for the company? Would the public welcome actuaries? Yes, I think the public would welcome us. Unfortunately, most of the public have never heard of actuaries, let alone this role that we play within the insurance industry. Of course, this fact that the public generally hasn't heard of us and doesn't really know what we do is really a problem for another panel. But actually, the lack of knowledge of the public about our role is certainly the source of a lot of these recruiting and selecting problems. If nobody's ever heard of us, if prospective actuaries haven't heard of us, it makes it very difficult to promote the profession as one that's attractive to an individual.

MR. JAMES C. HICKMAN: (From Louisville) I spent a good deal of my life as a fumbling teacher of mathematics, but mathematicians always start each lecture by giving a definition and then you draw certain conclusions from that definition. I will propose a tentative definition that actuarial science is that branch of science concerned with building intellectual models that are useful in designing and managing financial security systems. Okay. That's a definition. You know what's going on in the world. Will there be more or less demand for people with those skills 20 years from now? I think there's going to be more. I don't see any decline in the taste of our citizens for financial security. I don't see any decline in the threats to that security. I think the answer is there will be more. At the same time, will there be more or less people with the skills to build those models for design and management? Well, we're making less people, at least making a lot less than we did 30 years ago, and I think the proportion of them that have those skills hasn't necessarily increased, so it looks to me like I just described a scenario for boom in the business that you and I are in. Demand is up and supply is down. Great. The result is wages go up. Couldn't be happier! The trouble is, of course, that we have an obligation to recruit, train and direct those young people who will be providing those skills in the future, and it means it's going to be harder. We have an obligation to try to see that they have those skills, not only initially, but also the backup skills needed later to get the job done. That's what the Society is about.

What tools have we got? Well, clearly we've got the recruiting network. We've got the basic E&E network that we can monkey around with. Perhaps most important of all, for the next 20 or 30 years, we've got the continuing education system which includes meetings like this, publications, special seminars, as well as a research mechanism to supply some of the basic facts. We're pretty sure that all of those are going to have to be modified and probably modified drastically given the basic facts. Well, why do you think you have a problem? Why worry about this? What have been some of the things that have happened since the early 1950s that have influenced this business of building intellectual models for the management and design of insurance systems in which we as actuaries were either out in front or far behind, in which our roles were expanded or in which they were contracted, and why? Well clearly, one of the things that happened in that period was the advent of large-scale digital computers. We increased the speed at which we could do computation by originally the sixth power and now the seventh and eighth power. We reduced the cost of doing arithmetic by several tens of thousands of times, and with some pride you can say that within insurance your profession was a leader. Back in the 1950s, the Committee on New Recording Means and Computing Devices was a pioneer. We've lost a little of that within the actuarial profession probably for two reasons. First of all, I think management, of which we were part, thought that we

couldn't afford to take some of these bright actuaries and have them become computer specialists. They were too valuable elsewhere. Perhaps so. We also lost part of it because we found it very difficult to encompass some of these ideas within our traditional education and continuing education format. It's hard to know whether that was a gain or a loss, but it certainly was one in which we had a lead, but we as a profession lost that lead.

About the same time, 1950 or 1951, there was a series of remarkable papers in the British journals, ones by Hayes and Curtain and ones by Reddington on time matching of assets and liabilities. I believe that during the 1950s you probably could number on the fingers of your hands the number of North American actuaries who had any serious knowledge of those remarkable ideas; in fact, even among those, the arguments usually were why the ideas were irrelevant in North America because of guaranteed policy loans and cash values or that we do it anyway automatically. Yet those ideas have become almost the heart of the thrust of a good deal of current actuarial research and practice. We missed it, gang. They were very important ideas. They were in our literature. Whether we as a profession or our management missed their importance, I'm not sure that I could assess the blame, but those ideas were around for a long, long time. In the early 1970s, there was a series of papers in the *Journal of Risk and Insurance* and in the *Transactions* of the Society, particularly those that our friend Irwin Vanderhoof did, that brought those ideas to our attention, almost too late, because already many of the clients that we serve were having difficulty because they didn't recognize that the right and left hand side of the balance sheet do have a relationship.

Since the early 1950s, the theory of finance has had an explosion, probably starting with Harry Markowitz's thesis around 1951 at the University of Chicago, making explicit the idea that there's a trade-off between risk and return; not just a vague trade-off, but an explicit one measured by means and variances. Great idea. In fact, we talked that way for a long time. We still talk that way, but we still, and you can see this in some of our valuation conversations, have not yet brought into the mainstream the idea that there are trade-offs between lines of business, and that in fact some have more variance and some have less; there are insights to be gained by this. About the same time, the efficient market theory started in finance, the idea that a speculative process is like a little particle. It gets bounced this way and bounced way by information and in fact behaves quite randomly. Picked up on that one pretty well. At the time that people like Walt Miller were doing some of the original work on variable life, we did latch onto the fact that the markets were efficient, that death benefit guarantees behave randomly, and that selection on death benefit guarantees is slight; in fact, it was fairly easy to build a model. Chalk one up for us. In the early 1970s, the ideas of building mathematics for futures and options had profound influence on the markets, in part because of regulation. We were a bit late in picking up on the implications of that intellectual and later market development in managing investment risk. Win a few, lose a few.

There also have been some big things that have happened in the last 30 or 40 years that have changed our profession, maybe not changed us enough, that are not as intellectually oriented as are computers, time-matching and modern theory of finance, but were more along the lines of economic and political developments.

One of the most important of those was the blur of distinction between property and casualty insurance and life insurance and pensions. Many of our European

colleagues kind of laughed at the division that we've created in the United States between the SOA and the CAS; the real world, to an increasing extent, no longer makes that distinction. Part of that movement, of course, was driven not by intellectual forces but by economic forces, the desire by many of our employers to serve all kinds of clients, to give agents more things to sell. The implication is imposed on us because a lot of members of the SOA who have to worry about loss reserves need to use credibility ideas in some of their premium adjustments. But we're behind on our side. We have not had as much extensive research or readings on loss reserves and credibility as we should have, but on the other hand, our brothers and sisters in the Casualty Society are now confronted, and rightly they should be, with discounting loss reserves. This is old stuff to you since you've been discounting annuities probably since the time of DeMoivre in the early part of the 18th century. The real lines between property, casualty and life are going down, and that's part of our future. We've kind of missed that.

In bringing some of those ideas into practice, there have also been blurred lines between financial institutions. We just talked about time-matching of assets and liabilities, in many ways an ancient idea, but mathematics was in many ways done in 1951 and 1952. What do you think is wrong with the savings and loans corporations? Same idea. In fact, their mismatching of long-term assets and short-term liabilities is giving the United Sates a whale of a problem. There are billions of dollars of unrecognized losses out there because of that. That's a good old actuarial idea, isn't it? There is, in fact, a great big market for what is, in reality, an actuarial idea. We haven't exploited that market yet, but it's an enormous one. We owe it to the public in part to spread those ideas.

Now, you go down that list of ideas, what do you see? You see some successes on which we have expanded actuarial theory to do a better job of building these intellectual models, and some cases in which we weren't quick enough in bringing new ideas into our profession, into our science, so we could do a better job at this model building. You also see some successes when we were quick enough to loop in and bring into the actuarial profession some new social problems and some new political and economic developments. We can also see some losses. I'm probably not smart enough to say whether the last 30 or 40 years have been mostly gains or losses. I have an opinion that we may have been pushed back a bit. I think there were some important ideas out there that we did not bring in quickly enough, and I think there were some political and economic developments that we did not use to our advantage rapidly enough. Now, by our advantage, I mean not simply to fatten our bank accounts. I think the public would have been served if we had moved a bit faster. Well, enough for the last 30 or 40 years.

What about the next 30 or 40 years? I don't know. You'd be a nut to stand up here and say that you know, but let's take a look at what's going on. In a concurrent session, for the first time probably in the history of this profession, you will see some very serious discussions of epidemiology. I don't ever recall seeing a paper on some of the principles of epidemiology in *TSA* or even the other principal English actuarial journals. There are now. There is a place where we need to take a lead. We've got the mathematics. It's not the same mathematics. It's not the same statistics, but it could be done. Unless people like you take a lead in mastering that part of epidemiology, somebody else will because the job has to be done. AIDS is too serious.

We've also got a great deal of concern about the aging of our population. All of us are growing older and so is the population. That creates an enormous potential for actuaries to be experts and also a big market for their employers. We've done a lousy job of projecting those above age 85. For some reason or another, you'd think that would be an easy thing. We have not done a very good job on the technical issues of projecting that number, let alone a very good job of developing savings systems or insurance systems to provide for those above 85. An awful lot of our pensions decline in real value. Is that the way needs really occur thorough life? It sure isn't. Real needs go up in real value because the services that you must buy on the outside increase and reach a peak in the last two years of life. There is a job to be done out there. The job will be done. Society will be served. The question is, will it be served by us or will it be served by another professional group?

We're internationalizing the world very rapidly. Some of you may well work for companies that are owned overseas or own companies overseas. Is there any intrinsic reason why you couldn't buy your life insurance from Nippon Life in a few years? Is there any reason why you couldn't market in Japan? You already probably own bonds that are denominated in Euro dollars or your firms do. The answer is no; those things will happen. We have to be ready in our continuing education, probably more than basic education, to create a generation of actuaries with the political language and technical skills to operate worldwide. Somebody will because that's the way the world is going.

We all recognize that the world you operate in is a lot more complex than it was a few years ago. Every actuary who had an ounce of sense when he was studying life contingencies and took a look at the recursion relationship about reserves thought of universal life. You had to. It was there right before you. All you had to do was just generalize that one, make the premium variable, and the recursion relationships still work. Everybody with any wits had thought of it, but now it's real and the world is a lot more complex, and with that complexity comes more responsibility for you. No longer can regulation simply capture all of the things necessary to protect the public. It's simply impossible. The books aren't big enough. We've got to rely on people like you to protect the public interest in these enormously complex benefits that we are regularly selling and promising. If we don't do it, believe me, somebody else will.

Those are some of the things that I think are going to influence the next few years that the Society has to be ready for, not just to protect you, but to provide our function to society, to have enough people out there with the skills to build and use those intellectual models. Your Futures Committee has used a device called a vision matrix on which we put various institutions and various functions, and tried to measure how well we're doing as a profession and determine those areas where we're not doing very well and where there's opportunity. It's been a very interesting exercise. We're going to be using the input in a questionnaire. We'll try to come up with a plan. We'll try to present it to your leadership, but ultimately it will depend on you, because leaders can't afford to get too far out in the front. When you yell, "Charge," you want to make sure somebody is behind you. It will depend in part on you, your willingness to adapt, to engage in continuing education and to adapt our organization for these things in the future. We know that will be different. We know that the rate of the change will increase. We know, by the Darwinian principles, that you either adapt or become irrelevant and die. We've got the mechanism at work for adapting, but we need your help, your advice, your support.

MR. ROBERT D. SHAPIRO (from Boca Raton): I know the excitement is overwhelming right now; we found that although we only got four responses to that article in *The Actuary*, we've gotten over 330 responses to this questionnaire. So we all have a certain sublimated excitement. I want to do two things: (1) I just want to read some of the responses to and give some summaries of the questionnaire. (2) I want to try to put an interesting perspective on this.

The responses were fascinating. Some people took four or five pages of typed copy to give us their responses. The questionnaire consisted of the following types of questions. Are you in a traditional or nontraditional role? What do you see as the role of the actuary today? What should it be? What isn't he/she doing? What do you see it being in the future? Who do you see invading the actuarial turf? What will the actuary of the future need to do the professional job that he/she should be doing? What should the profession and the Society be doing to help? I'm just going to quote some of the things that we've gotten back, to give you a picture of what's going on. Obviously, these are selective quotes, but I think I've tried to pick out some that are representative of the tone. Admittedly, I may have a bias here toward change, but I think I've been fairly honest. First one is: "Even areas which are normally considered traditional will require actuaries who possess more than simply technical skills." Somebody else said: "Recruit people who have high skills and broad interest, including extra-curricular activities where leadership is evidenced."

Bob Myers, the former head of the Social Security Actuarial Administration, once said that the profession is "a mixture of an art and a science." And Roy Anderson, one of the futurists who has been helping us along the way, said, "Actuaries need art. We have all the science we can handle." Another individual said:

> We are training functionaries. We have to think of training managers and executives. We should identify candidates with an interest in the larger picture, and then train them to interpret and lead the process of change. The actuarial profession needs liberally educated men and women. The college major is less important than the fact that they are competent with the language and competent with mathematics. A mathematics minor should be quite sufficient. I'm not sure our selection procedures will induce this kind of person into the profession. We seem to be too heavily tilted toward the math major.

Another one said: "The actuary must go beyond being a healthy skeptic." Another person said: "If we want more extroverts in the field, we have to make the entry barriers for them less formidable. Lower the entry standards." That has a unanimity of votes. "Actuaries are viewed as inflexible, not people-oriented, not market-oriented, not investment-oriented, too numbers-oriented."

You should get a feel from where a lot of the comments and concerns are coming. These are, I think, from concerned people who want to see the profession do something to take advantage of opportunities that seem to be there, and also eliminate some of the concerns that exist.

I just want to talk a little bit about specific things that people mentioned in the area of invading our turf. The kinds of individuals or professions that were mentioned as invading our turf often were attorneys, accountants, for example, in the claim liability area, economists and statisticians. Life Insurance Marketing and Research Association (LIMRA) and Life Office Management Association

(LOMA) were also mentioned; LIMRA because of their lapse studies and LOMA because of their expense studies. Also on the list were brokers, nonexam actuaries, management consultants, MBAs, investment bankers, investment managers, demographers, health care analysts, risk selection analysts, and computer specialists. It's interesting because that's a pretty broad range of professions that are invading our turf. On the plus side, that says we're involved in a lot of areas which attract a fair amount of talent from the outside. I suspect it's as much of a plus as it is a minus. It's nice to be aware of that.

In trying to glean from the responses the reason for this phenomenon, it seems that some of them just have a different training and a different knowledge base from ours that leads them to function effectively in our area; the legal area is a good example. There's always a question as to whether it's appropriate for us to train in a certain area or not. Certainly some of the areas where we perceive ourselves as being invaded we need not explore because they're not appropriate. The toughest thing we have to do is to find what is appropriate. What is the scientific core of knowledge that distinguishes the actuarial profession from other professions? What should it be? How should it change? And equally appropriately, how should it be limited? We certainly can't be and won't be all things to all people, but the core of knowledge that we've identified in the past isn't appropriate for what we think actuaries should be doing in the future. We need to modify it.

Some of these other invaders appear to be lower-priced. Some of them are invading because their perspective is different. For example, some of the MBAs and management consultants are often perceived by CEOs as having a bigger picture than perhaps do actuaries. Some of them are more trusted. We're starting to do interviews, as Kin and Harold mentioned. Part of the task force activity is to go outside the profession and interview nonactuaries who have worked with actuaries and would have a good perspective on actuaries. That list includes CEOs of many of the insurance companies and academics who have taught actuarial science and insurance and so on. One of the things that is starting to come back is the trust issue, that actuaries too often wrap themselves up in a black box. "Trust me" is too difficult to understand; it creates less trust. Other people who take the same information but communicate it in an understandable way get to be more trusted. I think that's turning out to be an issue that we need to address somehow.

One of the questions that was asked was, "What are some of the additional skills and knowledge bases that might help actuaries better meet current and future needs?" Things that came out of that were law, computer programming, marketing, strategic and operational planning, accounting, etc. Also, there were things along the lines of negotiation, leadership, listening, creativity, teamwork, and, despite the actuary interviewed in the *USA Today* article, stress-management. The actuary in the *USA Today* article said that one of the nice things about this profession is that there is no stress. We talked about that before. It's hard for us to really relate to that.

There are other issues to be addressed. Public relations was mentioned. More timely studies in articles and the Cowell Study on AIDS are some points of interest that came up several times in the surveys. Also, to make sure our materials and recruiting attract more well-rounded candidates, improve the research. By the way, that's something that this profession has addressed extremely well over the last couple of years. There's evolving a research program that's really accelerating.

So there are a lot of issues coming out. We've just begun to take that input and we're not finished with the interviews with nonactuaries. As you're thinking about what you're going to tell us, you might suggest other areas where we might get data. Maybe give us some other perspectives. Our basic perspective is to place ourselves ten or fifteen years into the future, trying to get a sense of what the business community is going to be like out there, what the contingencies might get be, and what is going to be effective. Try to think about what the profession should or can do to effectively fit into that environment. That's our very basic approach.

It sounds ridiculous that we ask, "What is an actuary?" But when you attempt to define a vision, it really demands looking ahead a long way. Instead of dealing with what we've always been, we must look at the things that we do and don't do well, and maybe reconceptualize what an actuary might be in that context. We may very well come back to something that looks like today's actuary, or perhaps not so much like today's actuary. We don't know. But we're dealing with very basic questions. We're not asking first, "How do we change to become something different in the future?" Instead, we're asking, "Why? Why will people need actuaries? Why are actuaries important? Why is what we do something that should be continued?" Maybe some of the things we're doing shouldn't be continued.

The vision of the actuary that a lot of us have is that we're very well-respected, we've got good jobs which bring us a lot of money. And with that comes a fair amount of security; hence, questions arise along the lines of, "Why do we need to change everything?" For many of us seem to be reasonably comfortable.

When we dig into some of the responses, we seem to be losing ground in some areas. One thing that was mentioned is that it appears insurance companies are restructuring and becoming more SBU oriented or profit center oriented. The chief actuary's role is disappearing and is being replaced by a CFO in the new kind of institution. Obviously there's a track that leads up to chief actuary that's fairly clear for those actuaries following that track. When that disappears, you have a CFO role, which conceivably could be filled by an actuary, an MBA, an accountant. It's a different situation. So things may not be so secure, and we're worried as much about the actuary 15 or 20 years from now who isn't even recruited or selected yet as we are about actuaries today.

It might be useful just to talk about where we seem to fit on the professional spectrum. On the one hand, you have doctors, lawyers and accountants. These are legally recognized professions. They have a university-based educational system. There's a fairly clear, almost long-term historic knowledge base and so on. You move along that spectrum to management consultants and financial planners who are on the other side. They don't have university-based education. They don't have long-term recognition. The scientific base is hazy. We're sort of in the middle. We've been around a fair length of time. There seems to be a definable core, although it's very difficult to put it on paper. And we're not university based to a large extent. So we're sitting in a position that makes it difficult today to attain the status of the learned professions as the ones mentioned first are often referred to. As we look ahead 15 years, one of the issues we have to grapple with is how to get from that middle of the spectrum over to the left.

Cornell did a survey in 1986, asking businesses what they looked for in recent college graduates. According to the list (in priority order) that came out of that survey, here again, the actuarial training gives us #3 -- the work ethic, gives us #5 -- the analytical ability, and certainly gives us #10 -- the functional knowledge. But 1, 2 and 4 are also what corporations look for in recent business school graduates; leadership potential, interpersonal skills and communication skills are not things that are directly dealt with in the current system. Those themes keep coming up over and over again. I suspect those are the things we're going to have to wrestle with and somehow address in our final solution. We're well aware that the SOA probably can't and probably shouldn't implement anything specific in those areas. There are plenty of other places where those skills or that kind of training might be developed. But it seems pretty clear that the Society should at least anticipate what the market is going to bring for the actuary and facilitate some of those things in order that actuaries optimize future opportunities.

When we look toward the future, we tend to want to be thought of in terms different from those that are often applied to actuaries in a historic context. We want to be perceived as businesspersons, advisors, conceptualizers, persuaders, those kinds of things as opposed to being strictly analysts or mathematicians or technicians. We're not saying at this point, and I don't think we could ever say, "Let's get rid of our technical base and do something else." That technical base is, in fact, the core of the core. On the other hand, to be and to be perceived as being leaders, managers who are superbly technically trained, is different than being perceived as superb mathematical technicians.

This sort of encapsulates the concerns that were registered in many of the comments in the survey. I suspect it also reflects some of the concerns that will come out of the interviews that we're completing now. What we're really talking about here in many cases is broadening the circle within which the actuary is defined. Not necessarily changing the core to encompass everything in the circle, but looking at it a little more broadly. Perhaps this is a left/right brain kind of consideration. Most of our training has been designed to further our skills and in the logical sense, the analytical sense. Many of the problems and situations that we see as we look ahead really demand much more in the way of intuition and judgment. This balancing of the left brain activity that we've trained so well, the logical side, with a better understanding of right brain activity, making judgments without perfect data, is something we're struggling with. We think it has to get to that point. We're not quite sure how far to go or how to do it.

(From Question & Answer Session, Anaheim)

MR. JEFFREY D. MILLER: Most of us have as a part of our life a role as an actuary but we are also business people in a broader context. My question is, what role does the SOA want to play in the future, recognizing that the SOA will be just one of the organizations that its people belong to and participate in but certainly not the only organization? What role will we as actuaries play in the Society? The other point I wish to make is that the Society must define collectively what the actuary is.

MR. CORBETT: I think to some extent that this effort is aimed at defining exactly what the actuary of the future will be. I think the actuary will do a number of things that are nonactuarial; we can't expect and shouldn't expect that the Society provides the only training. Now, a very specific question this

does raise is whether the Society should get into management training. Should that be part of what the Society trains in? My ideas have moderated on this a little. I traditionally held the view that the Society should not get into management education even on a continuing basis. That's what I think we're talking about; we're not talking about making it part of the Fellowship requirement. Not because actuaries didn't need management or communications training or those types of things, but that we couldn't necessarily do that better than other organizations. We are not professional communicators, generally speaking. We are not professional management educators. I thought that education was better gained through other methods.

The reasons I moderated my view on this are as follows: First, my concern was that actuaries were losing out in insurance companies because they aren't better trained as managers. That says to some extent that even though these courses are available elsewhere, either actuaries are choosing not to take them or their companies are not selecting them to take them. Secondly, when the Society has put subjects like these on programs, they've been some of our most well-attended. I've forgotten the numbers, but we've had sessions on negotiation and things like that which have been extremely well-attended, so obviously the membership wants it.

Just another attack on this. I wonder, Jeff, whether there will be one actuary in the future. I'm very concerned. This opens up another area which I'll just touch here. Is our whole examination system too mathematically oriented? We tend to attract mathematicians and not general managers at all, not even people capable of general management. Then we wonder why actuaries aren't getting into general management. In the United Kingdom, the Institute is very concerned about this question of whether they should reduce the mathematical content of the examinations. On the other hand, I think there's a need for more mathematics. The actuarial profession is not that well-respected as a science among sciences, and I think we need people who are even more capable of doing state-of-the-art research in mathematical techniques that can be used to support actuarial practices. So, I've come to the conclusion that maybe we shouldn't just have one route to becoming an actuary. There could be a highly mathematical route, and there could be a route, and that is much more management oriented.

MR. MILLER: Somebody once told me that an actuary is somebody who knows everything about something and nothing about anything else. Maybe that follows from the idea that an actuary is an expert in an industry. We've had experience in building our consulting shop; we're trying to pull a wide variety of talents together as our consulting office has grown. We've been bringing people into our unit who are not actuaries; in fact, we just brought a person into our unit who is an actuary, but I was somewhat surprised that he is an actuary because he's oriented toward information systems and management and the like. He was once told by a senior actuary not to let the fact that he was an actuary hold him back in his career. So, I'm hearing that the SOA wants to be an educational organization that provides all of the education needed and/or desired by its members who become experts in some possibly growing collection of industries. Did I hear that correctly?

MR. CORBETT: Yes. Saying that it should be other industries is a more far-out thing at this stage, Jeff, but if we choose to go in that direction, yes. I think that the Society's educational system is going to provide primarily technical expertise. It may require education from other bodies in certain areas. I mean, we're never going to educate a person from the ground up in everything

they have to know in business. There have to be some boundaries around what we do and I think they are inevitably going to be more on the technical side.

MR. JAMES J. MURPHY: I've got two pieces that I think would relate to what you're saying. I don't want necessarily to prejudge the conclusions of the task force, but to some extent this process is one in which that sort of happens as we think about the role of the actuary in the future. One problem that I think Gary alluded to is not just what the Society does but how what the Society does is perceived by the student in search of a career. I like to look at what we've been doing, in a sense. We've sort of identified the mathematician, the universe of mathematicians, and that tends to be where we recruit from. In our syllabus, clearly the things we emphasize would attract that universe of mathematicians.

What we seem to be seeing is that our role will consist of holding our own as well as being effective in other areas where we can provide services, using skills beyond the technical. In some respects, the technical skills are being eroded by the computer, but the understanding of those skills is still very important. There's also the whole universe of people who would be good managers, good communicators, etc. There's an intersection of these two universes providing a whole group of people who can be both technically attuned and obtain other skills that they're going to need to be successful as actuaries in the future. We really need to take a look at how we are perceived, how we promote what we are, and what our syllabus consists of. So maybe we can attract people from both universes. The education and examination desired by the membership from my FES/FEM experiences will select the people who initially have management kinds of abilities, but who also have the math background. Right now we're just really getting the one group, and we're limiting our ability to observe because of that. That's one side of it.

The other comment I have is at the other end of this spectrum which is continuing education. I, too, have gone through a change of view about management types of training for actuaries. I'm not sure it's appropriate as a direct part of basic education, although I do see it starting to creep into the Fellowship admissions courses that are in the FEM concepts. I do see a role for us in continuing education in these areas, not in our doing it, but in our working with the providers of continuing education in certain areas to help design courses that fit the nature of the people that we tend to produce. Hopefully, that might change over time as well. One of the problems that I've encountered as a manager of an actuarial staff is that I can see loads of management courses, but they're all general purpose types of management courses and very seldom do they relate to management in a more technical, scientific role. And that's really what part of our role is about. I think we can do some things in terms of identifying and helping the experts in other areas develop our people, and then promote those to be used by our people in continuing education. So, that's a possibility.

MR. EDWIN F. BOYNTON: I don't want to leave the impression that the planning committee is going to hold a hand basket or that we are dramatically going to shift the emphasis away from necessary mathematical skills toward life insurance sales or something. Jim described the overlapping of two universal skills. We've also described it as a continuum. Obviously, when the chairman of the board of the largest insurance company in the world is an actuary, you know the profession is attracting some people who are managers and who can communicate. There are lots of people around like that, but I think what we concluded is that there aren't enough to fill the changing needs. We probably have filled the need up until now quite well. We have a balance of people who are pure

mathematicians and do very well at that. We'll always need some people like that, but the emphasis is shifting toward a broader need in the field of skills. So, we're moving along a continuum somewhat away from the pure mathematician and more toward the person with management and communication skills. I can't help but remember this comment at one of the early planning committee meetings: "Why can't all these new actuaries be like us?"

MR. CHRISTOPHER (KIT) S. MOORE: The first time I really thought seriously of the subject was when I read your note, Ed, a couple of years ago talking about the need to redirect our recruiting programs and our selection of new candidates for actuarial work. First of all, the areas of business to which we apply our techniques are what really define the actuary. The reason that actuaries are not well-known generally is that we limit ourselves to a few businesses, insurance and pensions for the most part. We're very well-known in those businesses. If you talk to people who work for an insurance company, they've always thought that actuaries were high up in the organization in some way or another. Whether they expressed it in terms of insults or not, you knew that they knew what an actuary was. I think that one area we need to discuss seriously is where we are going to expand. Of course, once we do expand, whether we know it or not, there will be a fight for that work. Other people are well-trained in mathematics as well. The only difference between us and those others is that we have been applying it to insurance and pensions; hence, we have developed a body of knowledge and a profession around that, very well, I think. For the reasons you've all been talking about I think we need to expand on that. So, I think we will have to keep in mind how we are going to defend our getting into somebody else's business, whether it's compensation work, which I think is an ideal example, or banking or trust work.

MR. BOYNTON: I don't think we can take actions which carve more turf for actuaries simply because we want to promote the actuarial profession. The profession exists to serve public needs; compensation consulting may be an identified area or may not be. But it is certainly one that has promise, in which we can do a better job than what's being done now. That's what we're looking for, areas in which by use of our special actuarial training and techniques we can do a better job to serve the public, industry, and so forth, than is being done now.

MR. MOORE: I actually left off the end of my comment and I think you're getting at it too; that is, this strengthens the kind of need Gary was talking about, to be educated in other areas that will be necessary for these types of work. One example of this need is in the consulting field. That's an example, Gary, in which communication is a very important element of the work. In order for us to explain in understandable terms what we're working with, whether it is insurance and pensions or something else, we have to be able to communicate better than we traditionally have as a group.

MR. MURPHY: Maybe I could put out a comment that might stimulate some comments from you. It comes from my reading on the plane the 66 responses I've received so far. A number of them were from pension actuaries, not all, but a number. And I presume this is primarily a pension audience, an employee benefits audience, or a consulting audience, at least not a life or casualty audience. The first question on our list of questions asked individuals to tell us what the area of practice was and what they thought the future might bring in that area, because as Gary said, we have to keep an eye on where we are as much as to observe where we're going. If we truly believe we're providing a

good public service in the functions we're now doing, we don't want to give that up. I found it interesting, and this is rough because I haven't done any formal summarizing of this yet. Generally the pension actuaries expressed more concern about their futures than I sensed in some of the other areas. So, I'm wondering how you might feel about that and if you have any thoughts about what can be done about it; if you agree with it or if you don't agree with it, why you might or might not agree with it?

MR. CORBETT: I'd like to encourage responses because this has been one of the points that we keep hearing conceptually that concerns the pension actuary because of the anticipated decline in the defined benefit plans and the growth in defined contribution plans which will call for fewer actuaries. My experience both within TPF&C and other consulting firms is that if anything, the demand for actuaries continues to be growing and everybody seems to be out there trying to hire them. Is this indeed not happening? Is this decline just something that's out there in the future or are there signs of it today?

MR. WILLIAM DAVID SMITH: These things go in waves. Milliman & Robertson, the firm with which I'm associated, is old enough to have gone through a couple of waves. About fifteen years ago, the health and life actuaries would have answered your questionnaire the way the pension actuaries did now. There was a period when the life actuaries who had been doing fairly mechanical work for a lot of small companies suddenly found that there weren't very many small companies left and mechanical work wasn't very salable any longer. The life people have changed their act and are riding on a wave. The casualty people are currently riding on a wave. The health people, to everyone's surprise, are riding on a wave. It is a surprise because it looked like ten or fifteen years ago the government was going to take over all health insurance work and there just wasn't going to be a need for actuaries. That's turned out to be totally incorrect. I predict that there will be a tightening of the belts in the pension field and maybe ten years from now you'll get a different answer to that kind of a question. I agree with you, Gary. I think that the kinds of things that actuaries do are going to be needed with ever-increasing frequency in an ever-increasingly complex world.

MR. BOYNTON: I personally look on what you're describing as the increased need for pension actuaries as, given the present trend, more of a short-term than a long-term phenomenon. In the last particularly five or six years, we got by Employee Retirement Income Security Act (ERISA); that sort of stabilized and settled down. Then, all of a sudden, we were hit with one piece of legislation after another which has increased the amount of work per plan enormously because it's incredibly complex. Starting with ERISA, that very complexity is leading to a sharp decline in defined benefit plans. But, the increased complexity will continue in the wave of plan terminations and so forth.

I ran into one of the senior actuaries in one of the major firms who passed on the comment to me that he was surprised and stunned that a number of senior actuaries, the consulting actuaries who have been trying to give the best consulting advice they can, are increasingly suggesting that it probably is in the best interest of many of these companies to terminate their pension plans. The government is so overburdening them with regulatory matters and the tightening of benefits and so bottling things up that they are seriously suggesting employers terminate. In the past, anybody in this business tended to resist this idea and tried to give employers all the reasons why they should continue the plan for the benefit of their employees, but the attitudes are changing even

among pension consultants. I have personally spent most of my career in pensions. The last few years I have moved out of it into different areas. So, I've not been quite up to snuff on day-to-day developments, if you will, or year-to-year developments in the U.S. in this area.

MR. SMITH: I think one of two directions will occur in defined benefit plans. The government has made it very expensive to maintain a defined benefit plan and this trend seems to continue. They could make it so expensive that companies start dropping out wholesale. That could lead to one of two things: (1) governmental type plans will take over the problem or (2) we will face what most other countries face, a requirement for a defined benefit plan. My guess is that it will be the latter. Perhaps when that's done the government will see the need to simplify things a little because under current conditions, the burden of trying to keep up with all of the changes in the shuffling of paper is just too great. For most plans, for no particular reason that we can see, it is just getting totally out of hand.

MR. MILLER: I guess I wonder if the pension actuaries might not have the feeling that they're in the railroad business rather than the transportation business when they make the comments in your survey. I guess my observation from the outside is that they're not in the railroad business, but they are in the transportation business, in the financial security business. It would seem to me that some sort of defined benefit plan is central to the retirement planning of any organization. Because it's such a basic, good concept, I don't think it will go away. In fact, I would concur with Gary, that the opportunities that I see in the employee benefit and pension fields from the outside looking in are pretty phenomenal right now.

MR. BOYNTON: Unfortunately though, at least one factor occurs which puts enormous pressure on defined benefit plans. That is the variable of inflation, because the weakness of defined benefit plans is the inability to adjust for inflation. We also have more and more pressure from the unions and the like; it's a good news and bad news situation.

MR. MURPHY: Jeff, a comment referring to the survey, I want to make sure I don't leave a misimpression. It wasn't virtually every pension actuary that felt that way, but among the relative groups, pension and non-pension, life, etc., more of the pension actuaries felt that way than those in other groups. In fact, I was surprised, Gary, given some of our deliberations in the planning committee, that generally life actuaries were pretty up about their opportunities. I think your comment, Jeff, is well put. Those pension actuaries who tend to be high on the future, from their comments, descriptions, and answers to other questions, tended to view themselves as in the transportation business, to use that analogy. They tended to use the broader terms like employee benefits or compensation when discussing their business, whereas those who tended to talk in terms of pension funding or something like that would be more apt to have the narrow view and the greater concern.

MR. MOORE: Because I work in Canada, I'd like to just present the view from the Canadian side. Sometimes it's an alternative scenario that applies in the United States as well. Recently, we've seen a move to legislative indexing of pensions, defined benefit pensions particularly. This, by many people, has been seen as the final straw for defined benefit plans. The view I think you'll get, Jim, is that many Canadian actuaries are concerned about the future of defined benefits. However, I think Jeff's point here applies perfectly. It's a

very simple example, but actuaries have a tremendous opportunity in the area of defined contribution plans in Canada. Just as you've begun to or have seen for some years now here. The amount of actuarial consulting work that's needed in the grandfathering of defined benefits and in pay-out options and so forth on defined contribution plans has already proved to be more valuable in financial terms and work terms than much of the old defined benefit actuarial work which is now basically computer driven. It involves very little actuarial decision making in the process. It's a consulting tool as much as anything else now.

MR. MURPHY: You're clairvoyant in a sense, Kit. There were a relatively large number of Canadian responses so far currently in my earlier returns.

MR. MOORE: Can I just ask a question of the panel? How is the strengthening of the actuarial profession being tied in with this, The Future of the Actuary/The Actuary of the Future question?

MR. BOYNTON: Jim and I are both members of that other task force, and although we do have a lot of overlap, the two are not tied together directly. There's a significant overlap; some other members are also involved in both projects. We're well aware of each other. One minor problem is that this is essentially an SOA task force; perhaps it should have been a Council of President's task force.

MR. MURPHY: I've spent some time talking about that very issue with Allan Affleck who chairs the other task force. I did it in particular because I didn't want to duplicate effort. I view our charge and our role as focusing on the individual actuary, what the possible roles are for the individual in the future and what that individual's organization can do to help him be better prepared for that. Allan's focus is the strengthening of the profession. I'm working with the trees and Allan is working with the forest. How does the profession as a whole strengthen its position among professions and among the public it serves in getting its voice heard and meeting the needs of its members relating to professional activities? I think you would agree, Ed, we've been able to keep our focus from overlapping too much. Yet we also do have the overlap of people so we are aware of what both groups are doing. I also agree with Ed's comments that we're trying, even though the Society is taking the lead in this particular effort, to take a global view. That's why we involved the CAS members; that's why we sought to have membership representing various areas. I think the recommendations that will come out will say what the profession can do, not what the Society can do to help support actuaries. We may need to deal with other organizations when the time comes. If that's the case, we will.

(From Question & Answer Session, Louisville)

MR. DAVID ALAN BERKOWITZ: You were talking about recruiting actuaries in the future, talking about how it's getting harder, and I think one of the reasons it's getting harder is you have to look at what attracted people in the first place. Many college math majors were attracted to the actuarial profession because it was a way for math majors to get good employment with good salary; well, not perfect, but relatively good job security in a profession where the demand exceeded the supply. It was either that or go for a Ph.D. and take your chances there. Now, of course, the actuarial profession is competing with data processing and all forms of computer science as the demand for persons in those areas is increasing and a lot of people are questioning whether they would

rather go into computer science or go into a field where you're going to be studying for many years to come.

MR. MURPHY: I think that's a relevant comment in terms of the past. One issue that's come up in my experience with the E&E effort and the FEM/FES effort was the issue of travel time. You, I think, just referred to it in terms of our study process, our education and examination process. Another issue you mentioned in the recruiting arena, that I think relates a little bit, is the fact that traditionally we've looked to our math majors as the source from which we select future actuaries, yet much of what we see in the future involves business concepts, applications of mathematics in business environments be they employee benefit fields or life insurance or casualty or whatever. Much of the technical work is being done for us by the computer, etc. One of the things we're going to be looking at is whether we need to try to find a way to broaden the group that we select from, to include not only the math majors who have the ability to become business people as well, but perhaps people with initially identified business-oriented skills who have the ability to develop a math background. That kind of a broadening selection will better prepare the vast body of actuaries to deal with future needs.

MR. HICKMAN: First of all, no matter what field you're going to be in, if you're going to go to the top, you're going to be studying all your life. We've made it more formal perhaps, but if you're going to be a computer scientist, given the rate of technological innovation in computer science, you're going to be studying all the time anyway.

Second point that I'd like to make is that you're correct that we have mathematized the world enormously in the last 50 years, and for people with mathematical ability, the demand has increased far beyond what we had anticipated. We certainly see that in all fields of business, and the lack of that ability is the main impediment to students' success in business schools today. What's the solution? It lies in the middle schools. Students who do not take hard algebra in 8th or 9th grade have made a lifelong decision to take a different path and we live in a society in which mathematical skills are highly valued. I'm not sure what to do about it. I've spent many hours, particularly on minority issues in recent months, with respect to what we can do in the 7th and 8th grades to help minority kids, but let me say majority kids also should understand the importance of mathematical development. We've got to, in some way, impress students in the secondary and middle and maybe even elementary schools the importance of this. We aren't creating any more of these young people, but we have to fire some of them up. We probably have retreated from that in recent years. I think that we have not been able to, in some way, fire up the elementary and middle school students to aspire to that degree of excellence. I can see it particularly at the Ph.D. level. Thirty-seven percent of Ph.D.s in the United States today are foreigners. In engineering, foreigners comprise 52 or 53% of Ph.D.s, I think. We're eating our own seed corn intellectually in the United States and somehow or another we've got to get back into the elementary schools. We've got to fire young people up as to the importance of analytical development.

MR. BERKOWITZ: It's my belief that you will never find a lack of college graduates with strong mathematical skills, be they math majors or in some other related field. I think the problem is attracting them to the actuarial profession versus going for a Ph.D. in math or computer science or any one of a number of other competing fields, including accounting.

MS. PHYLLIS A. DORAN: I agree with you on that. I think we're talking here in part about the image of our profession. I think that for the college graduate, computer science may be far more attractive and that may rest on the fact that we do have this series of examinations. I think that if graduates really understood the long-term opportunities, the variety and the challenges that we face, this profession would compare far more favorably, but I know I certainly didn't see it that way when I entered the profession. It was something I learned over time and I think that's an image problem that we should address at that level.

MR. MURPHY: One area that Phyllis mentioned that our task force will definitely be addressing in terms of ideas about recommendations would be the area of public relations; in a broad sense communicating to various publics, particularly potential actuaries and potential employers, is what this profession is all about. We have an image problem with both audiences and we can go a long way toward improving that. Our PR people are going to have to address that issue and I think it's going to be a major factor in the future of our profession.

MR. HICKMAN: Part of the image problem with actuaries and people in mathematics and other areas is the fact that research still attracts faculty and researching new ideas still attracts bright people, whereas examinations seem to be the exact opposite of new ideas and exciting things. I'm not recommending getting rid of the examinations, but reality comes before image and we have to create the reality that we have new ideas, the idea that new ideas are important, and we have to communicate and publish them. *TSA*, for example, is not on the shelves of many university libraries. It should be on the shelves of most of them. We already talked about the time-matching ideas which have an ancient actuarial root. Rather late, the principal thinkers of finance found out about Reddington and Curtain. It was there, but they didn't read the *Journal of the Institute of Actuaries*. Marvelous paper. It was well into the 1970s, I think, before they recognized what had been done by those actuaries early on. That's a shame, because it would have increased the propagation of these very important ideas, but it also would have greatly increased the image of the profession. If the profession would do some really good stuff on applied epidemiology in conjunction with AIDS and make sure it was communicated, maybe in the *American Journal of Public Health* as well as *TSA*, things would begin to change. New ideas attract bright people, and don't ever try to sell something which is not backed by reality. We have to be open to new ideas. We have to communicate new ideas and we need to make certain that our new ideas are not simply confined to members of the SOA.

MR. WALTER N. MILLER: I would submit that while some perhaps fairly high level of mathematical skill is certainly important and will and should continue to be important for people who want to practice in our profession, that skill is necessary but not sufficient. One of the most important things I believe we have almost literally ignored in the past and still need to pay a lot more attention to in the future is communication skill. Collectively, as I look back over the years, I think we might have been fairly good at talking to ourselves, but we were lousy at talking to anybody outside, and of course, increasingly the "people outside" comprised all of the publics with whom we have to deal more successfully and more effectively if we are to shape and enhance and mold the future of this profession as we all wish to do. Let me give two very simple examples, but they are types of things that I suspect are or have been shared by many of us. They're all under the general category of the proposition that if you don't have good external communication skills, you can get away with it

until things start becoming volatile and suddenly you're up on the carpet someplace and you have to explain an unexpected event.

The first example regards projections. Many of us are in the business of projecting relatively small numbers that are the difference between two huge numbers. We project say $3 billion of income and subtract from that a projection of $2.9 billion of disbursements and we know that the resulting projection of $100 million of net income is probably a pretty touchy thing, but in the lovely stable days of the 1940s and 1950s we all forgot about it because it always came out right on target as things just stayed on track. Now, for ten years or so that hasn't been happening. Many non-actuaries, including many of the CEOs of the firms with which we're associated, have been asking actuaries, "How come you blew this projection?" Many of us have stood there and said, in effect, "Sir, we didn't blow it. It's just the kind of thing that can happen when you subtract a projection of one large number from another large number, so you should expect that." That's not a satisfactory solution. That's not something that builds the credibility of the individual or the profession.

Another example would be the one in which the actuary is called on the carpet for a sudden C-3 problem. That's supposed to be down in his area, but he's never done a satisfactory job of trying to bring to anyone's attention the interrelationship between pricing and investment philosophy and investment strategy. He hasn't tried, because he's been used to working with stable investment assumptions himself. Now something happens and strangely enough, in many situations, it's not the fault of anybody in the investment department because all they've been doing is reacting to markets, and that's all that these guys do, right? Well, in the minds of many leaders of many of the businesses in which we operate, that's the situation. We really, really need to be better communicators.

MR. HICKMAN: I'm tempted to say, "Thank you, Allen Bloom." Along with most of the critics of American higher education of course, Walt as usual has hit the nail on the head. Yes, communication skills are a big problem. They're not just a problem for actuaries. If you read any of the critics of American education, this problem is almost number one on the list. At the University of Wisconsin, we recently took a survey of 500 of our graduates, three to five years out of school, and their employers. It cost a lot of money; it was a good survey. Of course, it reinforced Walt's point that the skill they thought they lacked with which their employers agreed were communication skills. That isn't confined to Wisconsin. It's universal. Why? Probably the reason is partially cultural and partially economic. Class sizes have escalated, at least at universities, and my guess is they've escalated elsewhere. We have gone to multiple choice tests and to video delivery; the number of times that many students have had to from a proposition, defend it on their feet, and be constructively criticized is few. The number of essays they've had to write and have constructively criticized is few. These communication skills are learned by practice. They're very difficult to automate. We've thought of having computer labs in which students would write essays on PCs and have teachers pull pages up at random and constructively criticize what they've done. That's great for grammar and spelling, but organization is the main problem. That's linear and it is extraordinarily expensive.

So I think that two things have contributed to it, Walt, both of which are perhaps out of the control of the Society: the growth of class sizes and the shift to multiple choice exams, the shift away from practice in oral and written

exposition and secondly, the decline in reading. You undoubtedly read a lot more than the children of the current generation. This is a visual generation. They have grown up with television, somewhat passively, and we do have very deep problems in communications, but they transcend the problems with the SOA. I'm quite pessimistic really about what we can do as a professional society to rectify a cultural shift and some very deep problems in American education.

MR. MILLER: Let me suggest though that while I'm sure you're right, that "solving this problem" is certainly not totally within our control, it would seem to me that here are some important, interrelated facets that are or can be and should be within our control. The main one is the type of people that we're attracting to the profession. The undergraduate colleges of this country and Canada, collectively, by changes in educational methods at the undergraduate level, have certainly had something to do with the type of person that is "turned out," but the business schools, our profession, the computer science profession, and all the other professions really draw from the same pool.

MR. HICKMAN: Right.

MR. MILLER: Nevertheless, there are too many real-life situations in which you find an actuarial student, let's say even in confrontation in a business situation, with an MBA or an MBA candidate and the MBA or the MBA candidate chews them up and spits them out. One of the reasons that happens is that for some reason we are not attracting, from the same pool, the kind of person who can succeed in a situation like that, one who can exercise some communication skills. In my opinion, and now you're getting into stuff that is in the nature of thinking about very far-reaching changes in our educational system, one of the reasons we're not getting enough of these people is that there's not enough in our educational system, either in its content or its length to attract our share of them. There are things we can do.

MR. MURPHY: I want to comment on this issue because I feel pretty strongly about it and have a couple ideas that we're going to have to pursue. I agree with Jim that it's not an easy problem, but I think it's one we must address in various ways, in selection, recruiting, basic education and continuing education. We've had some successes, especially recently in some Society programs, where there have been sessions that dealt with providing communication skills, training or at least background for actuaries. It is my understanding that those have been very popular sessions and that's a good sign for the existing members of the profession, but for the future, selection is part of it and training is part of it. My experience in hiring actuaries tends to show me that those who have somewhat more of a liberal arts training as well as a technical training tend to develop into better communicators. Perhaps we should be discussing with the actuarial programs throughout the country the idea of broadening their base of requirements to include nontechnical requirements to the extent they don't already. Also, and this point gets back to the public relations image issue that Phyllis referred to, what people see when they look at us is the preliminary examinations booklet. That selects one kind of person. If what they see is a picture of the profession and what we as actuaries do, that will give them quite a different image. Perhaps that kind of thing would help us attract people who are interested in doing those things and interested in communicating.

MR. INGRAHAM: I'm really going to continue on this same point because I think recruiting is crucial to the future of the profession. One area in which we've been delinquent in seeking recruits is the investment area. In the UK and I

think in Australia, actuaries for a long time have been involved in asset management, as well as focusing on the valuation of liabilities, which historically has been a more narrow focus of actuaries here. I think one excellent way to broaden our base of recruits would be something along the following line. We have now, under FES, three established tracks to Fellowship; life, group and pension. My idea would be to tie into the business schools, maybe in the second year of an MBA program, in addition to a major in Marketing, Finance, etc., a major in Actuarial Science! You know, maybe this could be tied in with some flexibility in the Associateship exams, which is another idea that I think should be explored. We should never forget our mathematical roots. We can do a lot more than we do now in applied mathematical research, but it shouldn't be mandated for everybody. Perhaps we need more flexibility in the Associateship exams, so that people recognizing the increasing diversity of the actuarial profession could go down different paths. I think, getting back to this MBA idea, it was distressing to hear an individual at a large insurance company say not long ago that they lost a person who was passing early actuarial exams through an MBA program, because as they put it, there was a ticket he could punch at the pay-window. I think by actually going to this group of people in the MBA programs, we might capture a greater share of the best and the brightest that now is eluding us.

MR. MURPHY: Let me comment on that one just because it's very relevant to the first interview that I had with a nonactuary, as part of our task force work. Jim and I met with the CEO of a major financial institution with insurance roots. And one of the things that clearly came from that discussion was a feeling that the future of the actuarial area is increasingly involved with the liability and asset relationship, i.e., the investment side and the liability/product side coming together. This individual said that five years ago, he felt that the investment people were going to take over the role of the actuary; he has investment roots. He now does not necessarily believe that, and in fact, he said to us, "You know, the thing that you guys have that is so unique and important is your basic mathematical and statistical knowledge that our investment people don't have any understanding of." He believes now that it will be easier to train actuaries in basic corporate finance and theory of markets than to take investment people the other way. That says there's a great opportunity for actuaries to get into that field and to help the public we serve with our knowledge.

I think we're going to have to look at our basic education, and he felt very much that we needed to look at our continuing education, because he said the decisions in the area of finance are being made by senior people, not junior people. He also felt that our actuaries at those higher levels need some continuing education in the area of corporate finance, and that may very well be the kind of recommendation that comes about from our report, if we hear more of this. I know in our own discussions, we've had several thoughts. And in the replies so far to the questionnaire, many are suggesting that the area of investment is an area in which we need to provide more of a knowledge base to our Fellows.

MR. HICKMAN: I'd like to make a technical comment on what Harold said. Clearly, he's correct that finance is now the largest undergraduate program in most schools of business and by far the largest MBA major. Whether the events of the 19th of October will change that, we don't know, because they're all in the pipeline. In many ways, actuaries, as Jim pointed out, have an advantage in some of this stuff. For example, futures and options pricing. If you take a look at what Harvard in the MBA program is teaching about futures and options

pricing, they're teaching a lot. But they really simplify it a great deal. They do not, because the students don't have that background, get back to the fundamental mathematical developments on which futures and options depend. I understand why they do it, we teach it the same way at Wisconsin. But the actuarial students have at least a fighting chance to get back to those fundamentals and to influence that development, rather than simply be consumers of it. The notion not to monkey around too much with some of the basic mathematics is a fine one, because that is the root of a lot of modern finance. Putting actuarial science on in a final year of an MBA program is very attractive. We would have a great competitive advantage, because most MBA programs do not achieve that depth. Is that depth important? Yes, it is, if you're really going to start to design products based on it. So I think it is a very good idea. I believe if we did it right, and maintained those mathematical roots, we would have a competitive advantage.

MR. MARK D. J. EVANS: I think there has been, and Jim Murphy has hinted at it here, some development of a perception of a need for less technical actuaries, mathematically speaking. Am I reading you correctly or putting words in your mouth?

MR. MURPHY: I think there's been some discussion and concern about whether we overemphasize the technical side. I assure you that from our discussions, we don't want to reduce its emphasis, but we think that there needs to be a balance. Particularly with computers and other things doing a lot of the purely technical work for us, it's a matter of simply working with the results.

MR. EVANS: I would contend we need to maintain or maybe even strengthen the technical, mathematical background of our actuaries. For instance, you mentioned that a lot of technical actuarial work is being done by computers. My educational background, as a matter of fact, heavily emphasized computers. What this means is, someone needs to program those computers to do the technical actuarial work. The existence of computers enables actuaries to address much more complicated, much more theoretical problems that are mathematically much more involved than what they could a few years ago. This requires a strong background in mathematics, not a de-emphasized background in mathematics.

I'd like to go on to say that I'm somewhat disturbed by this perception of the need for less technical actuaries, and I'm also concerned about some developments that are a result of this perception. For example, the granting of examination credit for college courses. I think this is a move in the wrong direction, which will weaken the future of the actuary. As a matter of fact, I'm working with a group of actuaries; if anyone shares my concerns, I'll be glad to involve them to try to address these. Someone had also mentioned working with unstructured problems, that an actuary frequently faces. I agree that actuaries need to be able to deal with such problems. I feel also, however, that to successfully deal with such problems, and I believe Mr. Hickman is suggesting this also, the actuary has to have a strong theoretical background. The actuary will not only need to fully understand the mathematical aspects of the actuarial literature, but understand it well enough to use those principles as a foundation to develop new formulas and new algorithms. We're not going to get this from people who have something less than a strong mathematical and technical background.

MR. MURPHY: I'd like to assure you, I think from discussions we've had in the past and from some of the input we're receiving, there's certainly no feeling that the mathematical background should be lessened, necessarily, but that we need to look at the other aspects of our education as well. We could be the best technicians in the world, but if our employers don't understand what we're telling them, they won't do it. And that's been my experience more and more in my job. Employers, and even directors and trustees of organizations take their responsibilities more seriously today. Before, when you recommended action, the actuary could say, "We should do this," and that was that. Today, the actuary says, "We should do this," and the boss says, "Why?" If we aren't capable of communicating a response, making these people who are not technicians understand the technical work that we've done in a nontechnical way, we will not serve them well or serve ourselves well. So we do have to balance that.

I think we're seeing more and more specialization in our profession: pension specialists, health specialists, group specialists, life specialists, casualty specialists, investment specialists. Perhaps we need, I'm trying to think of the right term, a mathematical specialist. Maybe we need to allow for that kind of track as well so that the profession will grow by having people involved in various areas, including people who will actively pursue that very important technical base that is at our core. We don't want to lose our core in the process of working toward the future; we want to be able to use it better.

MS. DORAN: I second a lot of what Jim is saying. I think that none of us would say that we don't continue to need very strong technicians in this field. I think if we emphasize only technical capabilities, then we're going to miss the boat. If we have people who are not in a situation to be able to communicate technical issues, who are not in a position to influence decisions with an understanding of these technical issues, then we have indeed failed.

I think a good example of that is in the health field, the area in which I practice. The major development in health care in the last few years has been the proliferation of managed-care programs and options, multiple option programs. We, as actuaries, understand the financial implications of offering options. Here, you've got severe problems because of selection. But actuaries, in most cases, were not instrumental in designing those programs. They were instrumental afterwards in explaining why things happened the way they did. But in a typical company, a provider-relations or managed-care department was set up which didn't include actuaries. We should have been far more influential on the front end. I think that that's an example of us not being strong enough in communicating the things that we understood in these issues. I think that we'll continue to see more of these things develop in the future unless we change that particular facet of our profession.

MR. HICKMAN: I'm a little surprised at the amount of time that we've spent on the Associateship exams. I must say that I'm more worried about continuing education than any of that. Now let me tell you why. I agree with Jim Murphy that specialization has become important. But if you think that the particular specialties that are important now will persist well into the next century, I think you're wrong. And a lot of the new action is going to occur on the boundaries between what we now consider specialties. Walt Miller and I serve on the Actuarial Standards Board; the original organization of that board called for operating committees that were cut up into property, casualty, pension and life lines, the usual ones. Darn it, the first thing that came along was continuing care retirement centers that didn't fit into any of them. Is that the last one

that will be hard to fit in? No. It's got elements of pensions, it's got elements of short-term coverage, it's got elements of finance. There are a lot of other things that are going to be coming down the pipe that are hard to fit into those specialties.

One of the biggest responsibilities that this organization has to its members is to promote continuing education to permit lateral transfer. The internationalization of this business will probably not be encompassed in the basic Associateship exams, yet it's almost a lead pipe cinch that many people in this room will be operating in a much more international arena, requiring new facts and new skills that they do not now have. The Society should have a role in helping provide those skills. It is certainly true that the enactment of ERISA in 1974 changed the daily work routine of probably a third of the members of the SOA. They computed different numbers; they filled out different forms. That was a valuable skill. On the other hand, if you think that that regulation is going to be invariant into the next century, you must be fooling yourself. It is not going to be. We've got to provide people who can compute those numbers and fill out those forms and do that work, but things are going to change. The increased number of old people and the continuing, long-term care issue will ultimately have a fundamental impact on the design of the retirement programs. That will be reflected sometime in the next fifteen or twenty years, perhaps in mandated coverages and certainly in a lot of regulation. So, in my view, a part of the attention that we have been directing towards basic education and recruiting, as important as that is because every organization has to reproduce itself, should also be directed at continuing education. Most of the people in this room will not work throughout their lifetimes applying only skills they have today.

MR. MICHAEL B. MCGUINNESS: I'm the Society Vice President that the Basic Education System reports to at the moment. I have a few scattered comments from some of the things that were said. One of them stems from Jim Hickman's concern about the interaction between the CAS and the SOA on education. I wanted to tell him and the people here, because they probably don't know, that there is an informal group that meets at irregular intervals, which consists of two of us from the SOA and two of our corresponding members from the CAS and two members of the Canadian Institute of Actuaries (CIA), because of their particular requirements. We find that this is extremely helpful in trying to anticipate problems. One of the things that we are working on at the moment is the requirements which were initially suggested by the CIA for basic life and pension educational materials for casualty actuaries and corresponding basic casualty material for the SOA people going through the exam process. Jim Murphy doesn't have to hear about this, because he thought of it. But I think for the membership at large, it's a very encouraging sign, and the very good spirit of cooperation between CAS and the CIA is extremely helpful.

On the problem of communication skills, as you know, one of the outgrowths of FES/FEM is that we are starting to develop a Fellowship admissions course. We're still trying to define the scope and form of that. It's in a very preliminary stage, but it seems to me that concerns like communication skills might be addressed at this. Obviously, in a brief get-together of a few days, you're not going to teach people how to be good communicators. But you can make them aware of some of the problems, steer them in the right direction, and point out that in order to become a whole actuary, it's essential to have these skills. Then maybe we've served some useful purpose.

Harold mentioned the investment track. Clearly at the moment, the operating E&E committees are working extremely hard on developing FES for the Fellowship exams. As you know, the first series has to be written this November and the second series has to be written next May. It's a tremendous work load and that's what they're concentrating on. The investment track is one of the things that will fit into this scheme should we decide that that's what we should be doing. So, it's something that is there and we're thinking about, but we just don't have the resources to devote to developing it at the moment or examining how we should develop it, if we should develop it. We're going to work on it.

About attracting people into the profession, we've been made aware that math majors may not be the only suitable source. We are directing the staff to try to deal more with business schools and with other liberal arts majors. I'm not a math major myself, so I have a good deal of sympathy. Getting away from my Society role and taking up on something that Jim Murphy said, as a Canadian, I didn't hear any Canadian initials in those groups of people you are interviewing. I wondered if you could get somebody from the Canadian Life and Health Insurance Association (CLHIA), as well as the ACLI, thinking of the 17% or whatever who are members of the Canadian Institute also. There's a great deal of overlap between our problems and the U.S. problems, but I think there are some differences. I think that you would get a broader picture if you would talk to some Canadians.

MR. MURPHY: We do, in particular, have two Canadian members on the task force. They were not present the last time we were interviewing our nonactuary list and were specifically asked to think about comparable Canadian people. In addition, related to the informal work that you have going on with the CAS in the education area, we formally have two members of the CAS as part of our task force and they have been very active participative members in our effort. This is going to go a long way toward encouraging and moving toward more cooperation there as well. As Phyllis said, they sort of identified this concern sooner than we did and have already done a number of CEO-type interviews in the property/casualty field. We'll be sharing that input as part of our process. You can bet you'll get some recommendations in a report that we will submit to the Board in October, and I'm sure there will be some that will suggest ideas for the Fellowship admission course. There will be some that might suggest ideas for the early exams, for exam tracks, for education tracks, for continuing education, for public relations, etc. Hopefully, also, soon I'll be asking to find out just what activities are already going on. You mentioned a couple yourself now, so that we can be aware of them and encourage those we think are in tune with the direction that we see to go even further. So, we'll be looking at that.

MR. HICKMAN: One other thing, I think we've done a very good job with quick, ready kinds of things: tax law changes, regulatory changes, one or two days in or out. But I think some of the things that are coming down the pike are going to take longer continuing education efforts than that. It may not necessarily be coming to a special place and taking the course, but it's going to involve a bigger time commitment. Who pays? The individual? The employer? Who supplies that service? The SOA, the educational institutions, others? But a lot of things that I see coming will not be amenable to one- or two-day courses. I think that as a Society, in this case, the SOA, we've got to decide what our role is in these four major re-education programs in terms of your organizations. I think you're going to have to think about whether you want to always hire new people to do new things, which may be hard in the future given the fact that the supply of new people is going to be down for demographic

reasons, or whether you want to retrain existing people. Who is going to retrain them? Who is going to pay? These are big issues. But it's going to require a bigger continuing education effort than we've had in the past.

FROM THE FLOOR: I'd like to talk about Flexible Education on the Fellowship exams, if I may. I feel that, first of all, you were talking about travel time to the FSA, and I'd like to speak more specifically about the travel time between the attainment of Associate of the Society of Actuaries (ASA) and the attainment of FSA. I think it will even out things a lot more. Right now we have a lot of people who go from Associateship to Fellowship in 2 1/2 years, just like that. For others, it's infinity, they never get Fellowship. And I think what's going to happen is that you're going to see fewer people passing five hours of exams in one sitting and also fewer people passing zero. Because those who aren't quite as adept at mass memorization will know their limits and take two or three hours worth of exams per sitting. This will probably raise the pass-mark and make it more difficult on those who might have passed five hours worth. Probably what will happen is they'll pass some but not all of their pieces. So I think it will even out travel time a lot more.

Getting back to the recruiting problem earlier, not only do we have the challenge of attracting people to the profession in the first place, but I have witnessed people who have left the profession and gone on to something else. I'm sure that in North America, there are many who do so. No doubt examination frustration may be one of the reasons behind this. I think that Flexible Education will lessen this sort of phenomenon. I'm not sure if Flexible Education on the Associateship exams will help recruit more people but it certainly can't hurt. I think it will help. I do see one possible danger, though. Take the case of a five-hour Fellowship exam with 1,500 pages worth of material to memorize. If you cut it up into three shorter exams of 500 pages each and leave it at that, fine. But the E&E committee will have to resist the temptation to look at new books and say, "This looks good, let's slap it onto the exam." If the three shorter exams each grow until we suddenly have three 1,500-page exams replacing the old one 1,500-page exam, that will more than defeat the purpose of FES on the Fellowship level.

MR. MURPHY: I do not want to get into a discussion, but there have been a couple of statements that I felt like commenting on but held back. I have been associated with the E&E committee a little bit and I won't speak for it; I'll just speak for myself and about what our goals were. One, our goals were not to increase travel time. I think you may be right, it may balance out, it may even ultimately shorten on average. We'll have to see. I know the E&E committee will be sensitive to that. I'm sure they will also be very sensitive for very practical reasons to the work that they have to do, to the issue of adding significantly more material without reducing comparable material in other areas. That may be an area where the role between continuing education in the future and basic education meet. We'll have to see how that goes.

In the 350 odd replies we've received so far, a vast majority of them have actually referred to FES/FEM in a favorable fashion in their comments about what can be done for the future saying they think that we've taken a step in the right direction. They have similar comments to yours, to proceed with caution. And I think that's a valid way to look at it.

FROM THE FLOOR: I just want to say briefly, I didn't mean for any of my comments to any way de-emphasize the importance of good communication for actuaries. I actually agree with you on that.

MR. MURPHY: I think that you and I are in agreement on that. Both the technical skills and the communication skills are important and we want to be careful not to emphasize one at the expense of the other. The problem that we see, I think, on our committee is that we have maybe erred on the side of over-emphasizing the image people have of our educational process. And that may be the focal point of the recommendations that come out of the task force.

(From Question & Answer Session, Boca Raton)

MR. RONALD L. KLEIN: Perception is a key problem for actuaries. Not so much what we do or where we're going, but the perception of it. And I think that on the whole, we are perceived as a number conscious and boring lot. I know at our company we do a few things that might help other people. One of the things is that our actuarial development group, the student program, has meetings maybe once, twice or three times a year in which we encourage students to get up and speak about a project that they're working on, to work on their communication skills. For example, in the last couple of meetings that I've been to in the last couple of years, I would say about 80-90% of the remarks have been read. Even today I'd say maybe 67% have been read. That just gets to be a little bit dry. I wouldn't say boring and I wouldn't say less informative, but I would say dry. And that's what we're perceived to be: dry, a dry lot of people. I know, for example, we're working on a marketing project in my company. One of the actuaries was working on a piece of it, and the marketing people said, "Well we need it by next week." And the actuary said, "I can't have it by next week. It's going to take at least three weeks to do this work. Let me tell you what I have to do." And the marketing person said, "No, no. Don't even explain. I won't even understand it." There's the perception right there. Whatever you do, I can't understand. It's too technical. Basically it was one of those things where he said, "What would you do in my situation?" Those are the steps that are going to be followed. So I think perception is really the key. I think that we need to get better speakers, even at the Society meetings. We need to expand more as far as the public relations (PR) goes with the profession. I think once we knock that down, that's half the battle. People are going to say, "Hey, it's not so boring to be an actuary. Maybe I'll want to be one." So I think that's really half the battle.

Additionally, in my company, actuaries are encroaching on everyone else's business, rather than everyone else encroaching on ours. I work in field compensation, an area in which most companies don't have actuaries. We're reaching our tentacles into marketing, into law. We're moving out and expanding. So I don't really think that there's much trouble with the profession. I think it's more in the perception of what we do in the profession.

MR. SHAPIRO: One of the things that's interesting here is the situation in which the marketing department says, "We need this in a week." And our response is, "We can't get it for three weeks. Here's all the technical things we have to do." That's the kind of response that leads to the kinds of perceptions people have about actuaries. There are two ways you can address that. One is just saying, "It's going to take three weeks. That's the best we can do for whatever reason." The other way is, "Here's what we can get you in one week, and here are the limitations of it because we're not going to have all the data by

then. But if you're prepared to make a decision on 60% of the data because you have to make it in one week, here's what we can get you. If you give us the full three weeks, we can increase the certainty to 90%." I think a lot of us have an innate concern about waiting. We've got to wait for the last 1% of the data when a lot of the decisions just can't wait that long.

MR. GEE: Let me just follow up on that a little bit. I think it goes beyond perception. You mentioned you work in the field compensation area. I was the marketing actuary for a mutual company at one time. I had about 22 people reporting to me, 90% of whom were nonprofessionals. They tended to be more clerical, operational, making sure a general agent's contracts were filed and so on. I'm just wondering how many actuaries have that kind of role; more as managers than as the guy who makes sure you comply with Section 213 of the New York State Limitations, etc. Even as you move into the nontraditional roles, I think it goes beyond perception, and there is a clear barrier to entry for broad-minded people. When you look at the exam process, on the average, it takes about 7-9 years for someone after four years of undergraduate work to go through. There are some exceptions to that, but those are the exceptions. Basically, it consists of 7-9 years of intensive study and discipline. That's more than a perception; that's reality. So those are questions that we need to address beyond this perception of a green eye-shade actuary or number-cruncher.

MR. INGRAHAM: I'll make a comment on this, too. You want to make a distinction I think between -- Jim Murphy articulated this in the last meeting -- roles that we can fill as actuaries for which we're uniquely trained and roles for which we're not uniquely trained. We're not the only people who can bring something to the table, so to speak. In this field compensation area, I'm reminded of when I was chief actuary of New England Mutual. They put Marshall Lykins, who today is one of the experts in field compensation, in that section. Today he has a group of marketing people who are nonactuaries reporting to him, and he's really a bellwether in field compensation in that company. But it took some time to get acceptance. I think that was an example of the second sector, where he brought a unique perspective to that work. There were other people with their own kinds of training with whom he had to effectively interact. This is an example of the interdisciplinary team working effectively to serve corporate needs. Sometimes there's a siege of mentality that people of nonactuarial backgrounds have when it's suggested actuaries might make a contribution to their area. Happily that's changing. Today, in that particular company, there are two actuaries in the investment department, one doing portfolio management and the other asset liability matching. So that's one practical thing that the actuary has to be sensitive to in trying to interface effectively with nonactuarial peers -- the acceptance question.

MR. DAVID SAUL WEINER: I've been sitting here thinking maybe there's something in our training and our tests that makes us biased toward thinking that we actually can get the right answer once we have the right formula or the right set of steps to take. In the world today, with so much uncertainty, and so much change, there would only be a false sense of security to come up with the right answer. I'm wondering how we could incorporate the ability to look at something and say that such a step would be useful but at the same time recognizing that no single formula or procedure is going to be sufficient. Or if it's sufficient today, it might not be sufficient tomorrow.

MR. SHAPIRO: That's clearly a problem, and I think it's a problem not just because of the profession or not just in the profession, but in the insurance

industry that I'm familiar with. That industry has grown up with at least half of its business, historically even a larger percentage, in the mutual kind of track. Financially, that's managed retrospectively. You look backwards, you look at what happened last year, and then you determine dividends and prices and everything else. All of a sudden you hit what we've hit in the last ten years, which says the way we used to do business doesn't work anymore. You have to place yourself in the future and establish ways of administering things and investing things and underwriting things and marketing things that are different than in the past. Yet, the propensity is to go back and look at prior experience. So you get wrong answers and you stop doing things you ought to be doing. There's a real problem there.

There's a major issue that appears in a lot of insurance companies right now that I think really spotlights that. It's this investment that many of us have to make in going from a policy-based system to a customer-based system. As we become more "customer-oriented," we have to have a system that keeps track of customers and aggregates all the information by customers and so on. In many companies, that's a multimillion, say $10 or 20 million investment. For example, take a very strict cost accounting approach to that and say, "Okay, if we're going to spend $20 million, what's going to come out of it?" You easily come up with the answer, "We can't spend the $20 million." But if you step back and say, "Gee, if we don't do that, we'll never become the company we want to become ten years from now, and I can't quite put my finger on why," you'll probably come up with the right answer.

That's not an easy one to get around, but it is sort of this left/right brain kind of thing. There are some times when you just know and can't quantify perfectly that something is a right answer. We have to have some mechanism to tell ourselves, "It's okay to make that decision," and then track it in some way that identifies the things that should happen to justify the decision, some of which may not be financial. That's probably getting a little bit beyond what we're here for, but it's a real important issue. It's not just an actuarial issue; it's an accounting issue, too.

MR. INGRAHAM: Let me pose a question to you, changing the subject a little bit. Just before this meeting began, there was a seminar for chief actuaries of stock and mutual companies. There were about 16 or 17 stock company chief actuaries and 16 or 17 mutual company chief actuaries who had their own separate sessions. Then there was a joint session. There was a questionnaire handed out for each group to answer. I wanted to read you two questions from that questionnaire and their responses; hopefully, we can get a discussion going as to why the responses came out the way they did. First question was: "In recent years, the actuary has been gaining in professional status in our industry." Of mutual company actuaries, 2 agreed and 13 disagreed. Of stock company actuaries, 8 agreed and 7 disagreed. The second question was: "Communication skills are now more important than technical and analytical skills for actuaries." Of mutual company actuaries, 5 agreed and 14 disagreed. Of stock company actuaries, 10 agreed and 6 disagreed. Those are pretty significant differences and I was fascinated by what came out of the survey. I'd be interested in your reactions as to why you think there was such a different set of responses.

I'll give you two ideas which came forth from our analysis after we had the joint meeting. One was that the group of mutual company actuaries basically represented middle-sized or large companies, where the jobs were more structured.

Stock company actuaries ranged from the chief actuary of the Aetna down to a number of companies that are relatively small, where the actuary had to perform more as a generalist, interacting with more nonactuarial peers. Maybe that's why the stock company actuaries had a sense that they had been gaining more in professional status than the mutual company actuaries.

Similarly, on the communication question, the feeling was that in the stock companies there is more interface with the public, particularly rating agencies and regulators, than perhaps the mutual company actuaries get into. But those were just two points of view. I'd be interested in any reactions from any of you on this, and whether you think this gives us a clue to some of the perceptions among our own ranks relative to different company jobs. I think there is the risk of statistical fluctuation, but I think there's more to it than that.

MR. JOHN EDWARD HANRAHAN: Coming from one of the large mutual companies, I think one of the reasons that actuaries of mutual companies felt the way they did is that there used to be only individual life insurance companies. I think there was a lock on it. People who really understood insurance were actuaries, they advanced very quickly and became heads. When I came to the company in 1978, the head of the Corporate Services Department and the head of Personnel were actuaries because they were young and got to the high level sooner. They and those like them ran the company. They weren't the chairman as he is now. I think the stock companies are probably smaller and newer so the actuary has to be involved more in other areas and has to communicate better. I think it's just the nature of the business. Now we're not just an insurance company. We have to consider the rest of the field.

MR. INGRAHAM: Anybody else have any thoughts on this? Sometimes you have to be very careful about the wording of the question because you can get some biases. That second question, for example, "Communication skills are now more important." I think it was the "more important" that may have thrown some people off the track. There was a consensus on review here among some of the mutual company actuaries that it wasn't more important but it might have been significantly important. In other words, the technical and analytical skills are necessary, but by no means are they sufficient.

MR. KLEIN: I think another problem might be that the CEO might really not know what's most important to people coming in. I think they're just answering the questions from where they see it, but down on the lowest ranks like where I am, you realize what's really most important. Right now, we're doing the hiring, and I'm assistant director of hiring for the program. We really look for communication skills. So I would have answered that question much differently than my CEO. Sometimes I think that might be a problem. When you're asking the questions, you're going for the upper-level people who might not really have the best picture. You might want to go toward middle management and even people sitting for the exams, find out what they perceive the profession to be and what's most important. I think sometimes you're going from the wrong end; maybe you should go from the bottom up and see how everything changes as you get higher and higher. That might be more interesting.

MR. INGRAHAM: I think this is very important in the considerations of the Murphy Committee, which in turn, in attempting to get appropriate responses, needs to properly segment its response groups.

MR. SHAPIRO: That's a good suggestion. We're thinking in terms of three dimensions. We're thinking of how the actuary might be defined today and how the actuary of the future might be defined. Primarily, there is a dimension that might be called "business dimension." Actuaries are a unique profession in that we're "scientists," but we've traditionally worked in two businesses: pension and insurance. So unlike the other professions, lawyers and accountants and doctors, for example, we have our businesses historically very well-defined. So one dimension is, "Should our business of the future be the same one that we've had in the past?" Both those businesses are changing. You've got the insurance business becoming a financial services business; the pension business is also becoming something different than what it was. So how do we redefine the businesses that the profession should serve. Should we talk about financial services for example on the insurance side? Should we talk about regulated business? Should we talk about all businesses, including utilities and so on? That's one dimension of the issue.

The second dimension is the technical knowledge base. There's mathematics. There's maybe a broader framework, mathematics plus some of the MBA kinds of analysis. Then there is the general management level. Where on that perspective have we been? Where on that perspective should we go?

Finally, the third dimension is the education perspective or the perspective we take in our work. Historically, we've taken a pretty narrow drill-like kind of approach. How much do we need to broaden that in the future? In looking at those sorts of cues, we must answer questions regarding the types of businesses we serve, the depth of technical versus management knowledge necessary, and whether the perspective should be a broad or narrow one. Where do you think we should wind up? I think historically we felt that a narrow business required a narrow perspective and a pretty narrow math background.

MR. INGRAHAM: Another way to state this question is, "To what extent is our current exam structure, by current I mean the new FES/FEM, too, a help or a hindrance in producing the broad cross-section of actuaries with the skills we need today?"

MR. FRANK EDWARD WALKER: My comment maybe applies more to the Education Committee, but the University of Texas Business School had a small actuarial science program which was basically eliminated earlier this year. I was interested in what you envision the role of actuarial schools to be in the future, whether they'll be more important or less important. What are the Committee's feelings about this?

MR. INGRAHAM: I'll give it a try, because it's been something close to my heart going back to when I was General Chairman of the E&E committee back in the mid 1970s. We can look to Canada, to schools like Waterloo, where you have something like nine FSAs on the faculty. And then look to the sorry state of actuarial education in the U.S. which was the theme of Dick Robertson's presidential address two years ago. There are a few programs that are thriving that are almost well-kept secrets. I had the opportunity to speak at Lebanon Valley in Pennsylvania. Under Bryan Hearsey, it has about 40 undergraduates who are taking exams. Arnold Shapiro at Penn State has a pretty good program. The Michigan program is barely alive. The Nebraska program is, I guess, alive. And there are spot programs around in other places like Wisconsin and Ball State and Illinois. Georgia State, of course, has been a long-standing success. I think we need more of them, but it's difficult to get the critical mass that seems

to justify their continued existence. I think that's what happened in Texas. They finally just allowed it to die because there weren't enough people coming through the pipeline and it was dictated by economics.

I think we need somehow to find new ways to attract students. One of my ideas has been to, within three to five years, create an investment track to Fellowship, to go along with the group and the pension track. We think not only is this needed because more actuaries in both the employee benefit and the life side are getting into the management of assets as well as liabilities, but also because it makes conceptual sense to try to structure an exam syllabus that might key into an MBA program. The idea would be, in the second year of an MBA program, add to the available majors which now are finance and marketing and whatever, an actuarial science major, which might lead somebody to pursue Fellowship in the Society by going down the investment track. We have a small but increasing number of actuaries who are very successfully working in fields ranging from investment banking to insurance and pension investments.

I see that as a way to enrich and enhance the flow of people coming into our profession, and also to respond to the changing needs where we can make a significant contribution. That's just one idea. It's sort of a long-winded response to your question about where actuarial programs are going. I think one other thing we need to be sensitive to is that, as I said before, there are many actuaries of the future. I think we have to be able to respond to increasing diffusion in types of actuaries. There should be a place in this profession for somebody who is a very strong applied mathematician because I think we need to do more mathematical research in a variety of areas. But, on the other hand, it shouldn't be necessary to have an overabundance of mathematics in order to be an actuary. I think we need to continually strive to be as flexible as possible in our E&E requirements so that we can accommodate the broadening range of actuarial needs.

MR. GEE: I think one of the charges that the task force has after we solidify is to come up with some steps, suggestions, and actions. An important topic is selection and recruiting. I don't know how many of us in choosing a career at the college level had decided to become an actuary. Other key points are the perception of the actuary, and the knowledge of the general public as to what an actuary is. When you look at all the professions as they are defined, there's only 11,000 of us in terms of FSAs and ASAs, members of the SOA, plus maybe about 5,000 on the casualty side. It's a very small number, considering how many lawyers and doctors and MBAs are out there. So part of that thing that we want to talk about is the promotion of an actuarial career via better PR.

But before we get to that point, we need to decide what is the future of the actuary and what is the actuary of the future so that we know which concerns to address, one of which again is the fact that the basis of entry is 7-9 years. So we are aware of those issues and we will be trying to address them.

Actually there are some very simple things that can be done to attract a different type of candidate. One is as follows. For years, when somebody asked about the profession, we'd send them a book that had Part 1 and Part 2. It looks like a lot of mathematics; it's all calculus and probability and statistics. The Society is changing that booklet. I'm not exactly sure what they're doing, but I think they're going to take one of the mathematical exams and maybe one of the more business-oriented exams as the examples so that you get a picture

that there's more than a mathematical/technical role to the actuary. That's very simple and yet we've continued the same process at least through last year.

MR. EVANS: My belief is that the SOA would at least maintain its current level of emphasis on mathematics. I decided I wanted to be an actuary in high school, so consequently I was an FSA in my early 20s. Part of the problem may be just getting the PR work in place to catch people earlier in their academic endeavors. Obviously a lot of this is just a matter of opinion, but I believe the job of the SOA is to train people with strong mathematical skills to become actuaries. I do not believe the Society's job is to train people to become CEOs or even CFOs of insurance companies or any other organizations. If someone who is an actuary has a desire to get into very senior management, let him go to an MBA school to get that rounding or whatever you want to call it. But I don't believe this is the Society's job, and I'm frankly disturbed that the leadership of the Society is interested in going in this direction. I don't want to see it.

Now, I don't mean by any of these comments to say that good communication skills are not important for an actuary. They are. I wish I had more of them. But, on the other hand, I'm just not at all comforted by the direction that the leadership of the Society seems to be trying to take. Admittedly, I'm somewhat biased because in my particular job I do a lot of research activities. I think it's definitely true, with the increasing complexity of products and the advent of the development of computers, that technical problems actuaries are facing are more complicated now than they were previously. Frankly, there's going to be a need for increased specialization in all industries, including the insurance industry and employee benefits industry. It's my opinion that the SOA needs to be preparing people to be able to conquer these very complicated technical actuarial problems. Let the MBA programs at Harvard train people to become CEOs. And if an actuary is interested in becoming a CEO, then in addition to obtaining the FSA designation, he can go to Harvard and get his MBA if he feels that's the proper preparation for his career goals. I've got some other comments, but let me leave it there for a moment.

MR. INGRAHAM: Let me respond, and we probably all want to respond to this. My school was MIT, where I went to become an engineer. I switched to math, but never heard of the actuarial program until I was almost through with school. I had functions of a complex variable, five terms of statistics, vector analysis; I was well beyond calculus. And I bitterly resented taking these exams for which I had not studied the material in 3 1/2 years. That's why I'm a very strong advocate for equivalent college course credits. I do think we chase away important people from our profession because of the travel time issue. That's why I'm an advocate of flexibility. We should always have an exam structure, but we should also encourage people who can to get a fast start. If they can prove that they can pass exams like Life Contingencies, then give them equivalent college course credits in order to enrich the flow of people through the profession.

Now the same school that I went to has a business school called the Sloane School. The Sloane School is focused on those who want to blend a management program with technical training. Many people major in computer science at that school and schools like it. Computer science was the most popular course. I'd like to see the SOA capture some of those technically gifted people, people who we're just not getting access to now. I think the whole theme is not to throw away what we have, but rather to enrich the process, to bring in a broadened

base of actuaries who can cover the gamut ranging from doing the sort of research I think we all are concerned about to having actuaries make a contribution in areas where we don't seem to have the opportunity to contribute.

MR. GEE: Let me just comment also. You mentioned that you were disturbed by the direction in which we're headed, and that our job shouldn't be to train CEOs and CFOs. You also mentioned the increased complexity of the environment that we live in with respect to the insurance industry. I agree that the charge of the task force is not to train CEOs and CFOs. There's been a lot of discussion as to what the duties and the charges of the Society in general are. That is not the charge of the task force. Our task is to see what we think the future role is, and there seems to be a consensus among many of us that the future role should be broad based as opposed to narrowly focused. Actuaries have been accused of being good problem solvers. Once you tell us what the problem is and give us a well-defined situation, we could probably come home with the most optimal answers. But because of the increased complexity, you're talking about problems that are not well-defined. A lot of times you don't even know what the problems are. You don't know if there's a perfect solution. You make certain assumptions and monitor and then react as quickly as you can. Because of that, I think we need to broaden our perspective. The purpose of the task force is to increase and broaden our perspective, not to be as narrow as we have been, but not necessarily to train CEOs and CFOs either.

MR. EVANS: Let me comment quickly. A lot of the arguments and justifications that you presented earlier for the committee's activities expressed a concern about the number of actuaries who are getting into the CEO position or the CFO position. It sounds to me like you're making contradictory statements.

MR. SHAPIRO: If we gave that impression, that's not what we wanted to give. Our concern was based on the fact that we seem to be losing status, not necessarily that we weren't getting to be CEOs or CFOs. The respect for the profession is decreasing. Let me clarify something. I think Harold and Kin hit the nail on the head. All we're trying to do is identify the right perspective for this whole issue. To give you an example, mortality studies have been done by the SOA forever. We can do mortality studies backward and forward and upside down better than anybody else in the world. But if you look at the *Transactions*, the mortality studies are often useless. While our business has changed, and we now have nonsmoker/smoker categories and different risks, we've got this whole bunch of data that we accumulate the same old way and present in the same old way. I think what we're trying to do is say, "Okay, we don't want to destroy the technical core. We want to preserve that which ought to be there for the profession. But we've got to be able to point people in a direction and say this is the framework within which you should use that technical core and communicate it." That's why I think we're having problems. We're not trying to create CEOs or CFOs. But we've got to make sure that people know how to deal with problems in order to be able to have their work accepted and have their business respected. By the way, here are the kinds of things that are demanded in these other positions in the company and what you need to do for them. We're not planning to have an MBA school in the SOA or anything like that. I suspect we will though, say, "If you're thinking in this direction, here are some things you might consider for continuing education." I think that's probably where we're going in a general way.

MR. EVANS: I'm sorry. You're saying address some of these broader issues through a continuing education approach.

MR. SHAPIRO: But not to provide the continuing education. To say, "Look, if you want to become a CFO, here's what the dimensions of that position will be. Here's what you're trained for. Here are things you might want to do. And here are some places you might get that kind of training, like Harvard or whatever." But I don't think it will ever be our role to become a master school and do all those things. I think we do have a responsibility to at least provide some direction.

MR. EVANS: That sounds like a reasonable, intermediate position.

MR. SHAPIRO: If I gave you a different impression, that's not what I wanted to do.

MR. GEE: Those are very clear-cut examples of the trend or direction. You can go into other examples that are not so clear-cut and make sure Society members get to be CEOs and CFOs. But if you look at a lot of companies now doing strategic planning and corporate planning, a lot of companies will hire a Mackenzie or someone like that for their planning. I will make an argument that the actuaries are probably in a much better position to analyze some of those things and make predictions, not necessarily to extrapolate, but to say what the trends are to help identify some of the issues that are very crucial as part of the strategic planning. I suspect there are not a whole lot of actuaries who are involved in that thinking, not even at the senior level.

MR. EVANS: Let me interject there for a second. My company did exactly that. We went out and hired some consultants. They just turned around and asked the actuaries a lot of questions. But the whole point was that we simply wanted somebody from outside since they bring in a little different perspective. It's not because they were or were not actuaries or they were or were not anybody else. I suspect the same is true of a lot of other companies.

MR. GEE: I guess we all have different opinions. I think that part of that is to get an outside perspective. And also, to confirm the inside view. But I suspect a lot of that is also because the Mackenzies and so on have the reputations of having a broader perspective than a typical actuary.

MR. NAZIR VALANI: I'd just like to share my experience with you. I've been involved in managing large-scale projects. Fortunately I've been perceived as a person who has good communication skills, so that has helped in my having management responsibility. However, in the past, the argument has been, as far as managing a project, mostly product development projects, that actuaries are deficient in communication and interpersonal skills. You try to answer for all aspects of a project. So you look at administration systems, product development, the whole thing. The argument of actuaries trying to head those kinds of projects has been that they are very weak in dealing with people. So the tendency is to say, "Let's get somebody from Systems or some other administration area to lead the project, and have the actuary play a supporting role." I think that we could offer a course in these types of skills as part of our FES program, a 10-or 20-credit point course. I think it would be better if it was a required course on management skills to help enhance our roles. I would support that.

MR. KLEIN: I just wanted to jump in because I had a comment about FES. I personally think that the FES is a deterrent to the profession. Not a terrible deterrent, but I think it is a deterrent insofar that it's really complicated.

There was a time when you were in college and you heard about the profession and said to yourself, "Well there are 10 of these exams that I have to take." And now, just to read through that booklet and try to understand what's going on is very difficult. I'll make a case in point. If you take a poll right now of all the actuaries here, the Fellows that are here, I'll bet 80% of them have no idea what the transitions are. I know that when I produce the roster of all the actuaries in the company, I have to put a little transition in the bottom. You know, credits are for the old part 1 and the old part 2, etc. That's the only way people have heard of this. And in more than one session here, speakers have gotten up and made reference to the exams of two parts and three parts and four parts. These are speakers at a Society meeting. So I really think it's very complicated, and I think that's going to be a deterrent. Just the complication, not necessarily the degree of difficulty or what's on the exam. I would be much happier with a 10 exam syllabus or a nine or eight, whatever you want, and part 4A, part 4B, part 4C, part 4D and pick one of the four. But you have ten exams to take and that would be much easier.

Along the same lines, another thing that disturbs me is the fact that you're for college equivalence. One of the main reasons for this, and I may be wrong, is that when you were in college, you were unhappy with the fact that you had to go and take calculus again when you already took all this calculus. I know that it took me a while to get through the exams, and I started taking the exams in college. When I learned about the profession in my sophomore or junior year, right after calculus, I took the exam. And I think more people are doing that. So I think it's important that you ask the people who are coming up through the exams, "When did you find out about the profession and when did you take the exam?" I interview 40 or 50 people a year. They all take the calculus exam right after they take calculus courses. That doesn't need to be a concern any more. You have to get away from your peers who have taken them a long time ago and gone through those problems and say, "Hey, it was a problem. I hated it." But it's not a problem anymore. You've got to ask the younger people and the recruiters who you want to get involved with. Ask the people who are in charge of the programs. They deal with more students than anyone. I know we deal with 40 or 50 per year. So we know what's going on in the colleges. We know what's going on in the earlier stages of the working career. I think you have to do that.

MR. INGRAHAM: My pitch with respect to college equivalent waivers, if the person can pass a later exam, was merely to get more people in the profession. Like it or not, there are always people coming along who have the same sort of situation that I had where you just didn't hear about the actuarial profession because you happened to grow up in an environment where it wasn't talked about. I envied the people who knew about it in high school or early in college. I didn't. I think there ought to be a place for the kind of person who has the skills to simplify the entry, the travel time. Let them bet on themselves. If they can pass an examination on Numerical Analysis or Life Contingencies, then let them be excused. I also happen to be of the school that Part 1 is a waste of time. I know it's a great recruiting device. I know it's a selection tool as companies describe it. But I'm impressed by Marshall Field, the president of the British Institute of Actuaries, who, when asked recently why they don't have a Part 1 type of exam, responded that it's redundant. Now that's just a point of view, but it's something that keeps getting discussed in actuarial circles.

I'd like to put aside that issue because we can agree to disagree, and I've had some debates with Bob Batten on this.

MR. KLEIN: We don't disagree on that. I would say if you want to take out Part 1, take it out. But don't start to discuss college equivalence. Assume there's no Part 1; the first exam is Part 2. And here we go again, Part 1 and Part 2, Courses 100 and Course 110. Just take it out. But don't start to say, "Well, some people get credit for it and some people don't." I took calculus in college, and I got an A in Cal 1, Cal 2, Cal 3. I went to a good school; the State University of New York (SUNY) at Binghamton is noted as a good science school. We get most of our actuarial students from there. But to tell you the truth, those questions were a joke. They were nothing like the exam at all. The exam was much more difficult than getting As in those three calculus classes. So don't give college equivalence. Just assume you have to know calculus to pass statistics, so let's start with statistics. That's fine with me. So we don't disagree.

MR. INGRAHAM: I'd be happy to discuss this point with you later, but I would like to get back to one other thing on FES, alluding to the first remark you made. Don't you think that the idea of having an FES Fellowship structure modeled on the college approach, where you'd have majors, a core of material that everybody has to take, and then a certain amount of unrestricted electives, is a good one? You would produce a Fellowship in which you specialize in life or pension or whatever. Don't you think that is a better structure than the one we used to have?

MR. KLEIN: I guess in a word, no. I'm not trying to be too difficult. But I would say no. I would say that it is more difficult to respond now when someone asks, "What is an actuary? And how do you become an actuary?" Do you say, "Well, you go through this 450 credit . . ." It's very difficult whereas it used to just be a series of exams. I like the structure. I like the electives. I like the core. But I think it should have been designed more in a 1, 2, 3, 4, 5 manner. Then they know what courses to take. Just maybe 3A, 3B, 3C and you can take one of the above. Or, you must take 1 through 4, and you got to take part 6 that we recommend. It would have just been easier to explain. I just think that college kids, if I may, are coming out and seeing more college. I just can't deal with it. Whereas with professional exams, you pass them while you work and it seems different. It's a different perception.

MR. SHAPIRO: I agree with you that it is more complicated. There's no question about that. I'm not sure there's an easy way around it because I suspect that one of the motivations behind this, and I was not at all involved in FES/FEM, was to get the profession more university based, to make it more like the other professions and hence maybe be able to develop some of the things we want the profession to do. In the meantime, we're changing something that we're all very used to, and that was one of the simplifying things about the profession. I'm not sure that if we preserve everything that made us a profession in the past, we'll stay where we are or fall backwards. Maybe we won't. But those are the things we're struggling with. Really, you're hitting some issues that are critical, as are some of the other speakers.

MR. KLEIN: You can change Part 1 to, "Do you understand the new FES schedule?" That would be a great Part 1 because I bet that the pass ratio would be very low.

MR. INGRAHAM: I don't get as passionate about that as much as I do about my concern that we maintain the proper flow of actuarial candidates to meet our continuing needs. I happen to be particularly concerned about pension

actuaries. It was disturbing to me over the past few years to see the extent of alienation pension actuaries felt toward the SOA. One of their key points was, "Why should we waste our time going on beyond Associateship when we feel that the Fellowship syllabus is basically irrelevant for a pension actuary's practice, particularly a consulting actuary?" One of the things we've attempted to do, and we're getting some good feedback from the pension community, is to substantially improve the pension track to Fellowship. I honestly believe that we're going to achieve the goal of providing a strong incentive for pension actuaries to go beyond Associateship to Fellowship, not to stop with the Enrolled Actuary exams. To that extent, I think there's strong merit in the FES structure.

MS. JUDY C. ENGELS: One of the points that you made was that the environment is changing, and I agree. I think maybe it's changing fast enough. I do valuation work for Canada Life, both in Canada and the U.S. I found that doing U.S. valuation work is boring. If not for New York Regulation 126, the work could be done by a clerk, to put it very bluntly. Whereas in Canadian valuation work, the bases are not specified by the states or the provinces, and the actuaries have to certify appropriateness of the bases and of the reserves. In the future we will probably have to certify the good and sufficient assets. So if the environment in the U.S. is changing toward that direction, I think actuaries' prestige or demand will continue.

MR. GEE: Of course on the other hand, they make it simple because now you can use a single basis for all states here in the U.S., whereas some of the states have certain differences and not all the states are uniform in their bases.

MR. HANRAHAN: You mentioned public relations. I'm not so sure that the reason we aren't attracting as many people as we'd like in the profession isn't just because people don't know about us. There are so many people who say, "I didn't hear about it until I was a junior or senior in college, or even until I came to work for an insurance company." When ERISA first came out, there was a large influx into the profession; people heard about it and they said, "What is that?" And then they looked into it and said, "I'm good in math. Sounds good." When I was in high school, I was very good at math. Nobody mentioned the field at all. I went to an engineering school. When I did finally hear about it, I was a junior. I mentioned it to one professor who said, "No, you don't want to do that. It's kind of boring." The field isn't known. The recent article, the Associated Press article, is probably going to do more for getting people in than almost anything we've done in the last five or ten years since ERISA. I think that's something we should do more of, getting out to the high schools and universities and saying, "This is what our field is." That will get people going. That would address the people taking calculus so four years later they wouldn't be finding out that there's a test they have to take on calculus.

The second thing kind of goes back to some other points. It has to do with actuaries getting into other fields. I think what it comes down to is a lack of self-confidence. I think actuaries themselves, as smart as they generally are, don't seem to believe it when it comes to doing anything other than what they've been trained to do. I think the basic training that we've gotten in present value theory, interest theory and all, is enough to take on almost any financial question. It's just that we don't believe it enough to get in and do it. We keep going to these seminars to find out more about investments because we don't think we know it already.

MR. INGRAHAM: I couldn't agree with you more, particularly the first part of your comments. Regarding the flow of people into the earlier examination structure, we've never had more people taking exams than now. I don't think quantity of candidates is really the issue. Are we getting the full spectrum of candidates that we ought to be getting? Or has our recruiting been too narrowly focused without trying to display some of the exciting opportunities within the wide circle of actuarial activity? I think that one of the constructive things we've done in the past year has been to shift the focus of the recruiting material a bit.

MR. ROBERT KEVIN BOLTON: You all have spoken quite a bit about actuaries becoming better managers and leaders and communicators. And one thing I've wondered is how well a person can really learn to do that through an education system. I know my view of business schools is that the students generally don't have much instruction in those areas. They feel that they can learn those skills better through doing those types of things. I just wonder how well the Society feels a person can pick this up in a formal education setting.

MR. SHAPIRO: The question is, "How well can somebody pick up in a formal educational system leadership/management kinds of things?" I don't think we know. We suspect that maybe the best we can do there is to let the people in high school and college know that those kinds of positions are available in the industry, and the kinds of things that one would need to do to get there if one did it through the actuarial profession. You could really debate whether leadership is inherited or trained. We don't have an answer. I doubt if we'll have an answer by the time we are done, but we'll try to deal with the problem, and give some direction. Fortunately, we have someone like Jim Hickman on the committee who is the head of the business school at the University of Wisconsin and an actuary. He's been very helpful in that area, and keeps pointing out to us that there is no right answer to questions like that. We just have to keep thinking about them and working through the process.