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THE WORK OF THE ACTUARY IN THE FUTURE

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1. What are the unique skills that make an actuary?

2. What developments (sociological, economic, demographic, etc.) are likely to impact the work of the actuary in the future?

3. How will/should these developments change the way the actuary performs the roles and functions he has traditionally performed?

4. What new roles and functions do these developments open up for the actuary of the future?

MS. RONNA KLINGENBERG: One of the simplest ways to think about the future is to consider the forces that will shape the future. This includes current demographic, economic, environmental, technological and socio-political trends. Obviously I do not need to tell you about demographic trends and I am not foolhardy enough to give you 20 year economic forecasts. As for environmental trends, there are only two that you need to keep in mind: (1) continuing scarcity of fossil fuels and (2) loss of good farm land. Some of the more pessimistic work on environmental trends indicates that we will see serious global food shortages before the end of this century. If that is true, the future of the actuary will be among our more minor social concerns.

Before the end of this century, we can expect to see dramatic improvements in two areas of technology: biomedical and information. Biomedical improvements range from sophisticated screening techniques that can analyze potential health care problems in new born infants to the development of drugs that can be applied to specific areas of the body without a whole body effect. Health care futurists have forecast everything from hospitals on the wrist, driven by tiny computers to spare parts banks for the elderly. The other important trend is a blurring of the distinction between communication and information technologies. In other words, the distinction between computers, telephones, television, radios, etc.

There are two manifestations of this trend that are very interesting. The first is QUBE, which is a two way cable television system that has been marketed by Warner in Columbus, Ohio and will soon be available in several other cities. The viewer can 'talk back' to the station generating the signal through an electronic device that makes instant public opinion polls and market survey possible. The other system, currently available in England is called Videotext. Videotext hooks up a consumer's telephone and television to a central computer, so the consumer can use his telephone to request any information he wants put up on his television screen. The Videotext system makes available everything from games to railroad time-

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tables. Many people believe that these advances are a long way off in the future. This is primarily because of their own negative feelings about computers. I can offer two counter-arguments to this. The first is that a generation of children raised on electronic games is not going to have the same feelings about electronic technologies as we do. And the second is that computers are steadily becoming more convivial. In other words, we may not be too far away from computers with the capacity for speech recognition and speaking.

For socio-political trends, I will shorten the time frame so that instead of looking at the end of this century, we are looking at this decade. It is clear that the next decade is going to be very challenging for insurance companies. The main reason is that trends in the public policy process could mature into major threats. Let me give 6 examples of these threats:

1. There are indications that there will be more pressure on companies to make investments of special social significance. As we continue to experience an investment capital shortfall, the shortfall will probably be particularly acute in important social areas. Our government's commitment to social programs is likely to exceed our tax potential, but the public's commitment to social programs is such that we cannot retreat from social programs. One possible solution to this quandary would be for government to turn to banks and insurance companies and require them to invest in certain areas. There are more and more indications that the public feels social control of investments is appropriate. Union control of pension fund investments was the first sign, but now we are seeing recommendations that investments be directed, among other things, to conversions to solar power.

2. The first trend, social control of investments, goes hand in hand with the second - pressure for change in the way companies are governed. There is some feeling among the public that corporations have gotten entirely too big and that there should be more control over them. Ralph Nader and other powerful activists support the idea of Federal chartering of giant corporations; noted academicians are proposing such things as Presidentially-appointed boards of directors and, as you know, legislation has been submitted to the U.S. Senate that would affect corporate governance. Public distrust of business is down from its record highs, but as the economy spurts and falters, we can expect the public to be looking for scapegoats.

3. The last few decades have brought a steady expansion of the concept of public rights and entitlements. This trend - toward further expansion of rights - seems likely to continue. Two areas should be particularly active. One is the rights of the elderly, which will get more attention as our population matures. This will mean a focus on work practices: "retrofitting" people for new careers, a complete elimination of mandatory retirement, and expanded work options such as phased retirement and more flexible work schedules. Another new area - child care - should be very important as women born during the baby boom years struggle to combine careers and child-rearing.

4. Another issue that will persist is the privacy issue. In fact, as a result of technological developments, it will become even more complex. Alan Westin, Columbia University professor and consultant to Sentry Insurance on their privacy poll, suggests that the day may be fast

approaching when individuals own personal information about themselves and the only way to get that information is to buy it.

5. Technology will create a much more competitive market place. There is some evidence that other financial service providers have had a significant head start on us in providing electronic systems to the consumer. Banks are seeking legislative changes to relax state restrictions on electronic transactions. Combine this with a change in regulations that affect us, say, a repeal of the McCarran-Ferguson Act, and you have a whole new competitive ball game.

6. All of the previously mentioned trends will be complicated by the public concern about the risk classification system. The threat will be manifested as either a challenge to the use of certain criteria or to the system itself -- to treating individuals according to group characteristics. As the line between what is considered fair and what is considered unfair continues to move, we could witness the breakdown of the entire structure. If it is unfair to discriminate on the basis of sex, how long can it be fair to discriminate on the basis of age? This trend is particularly problematic when one considers that the private sector provides a diminishing percentage of the security against risk. As government programs expand, we may be less able to distinguish ourselves from them.

As the social environment changes, companies that wish to survive must follow. It is of great interest to me that in the past two years, at least a dozen of our member companies, most of them very large ones, have established units to anticipate public policy shifts so the company can respond to them in a coordinated and timely fashion. Actuaries can and should be playing a vital role in this process. My sense is that they are not. The challenge to you, then, is not only to anticipate the future, but to help your companies create it. A few of the things actuaries could do to forward this process come to mind.

1. To accommodate government regulation and consumer pressures, actuaries will have to become generalists, instead of specialists. As a group, they will need to understand the law, sales, systems analysis, and public relations techniques.

2. Actuaries will be called upon to 'simplify' and help consumers to understand complex insurance policies.

3. Actuaries will be asked to re-evaluate the assumptions underlying today's risk-classification system and premium pricing. In the near future, classification by sex may be declared illegal, and therefore actuaries may need to look at lifestyles, occupation or 'health life.' Today's non-smoker's policy is one example of new risk-classification techniques. Actuaries will also need to develop policies to give their company a competitive edge over other life companies and perhaps over other financial service providers.

4. Public concern over privacy will also have great impact on the actuary's work. The more sensitive the public becomes to the types of detailed information life companies can collect, the more difficult it will be for actuaries to change the classification methods. However, if there is going to be a change in the risk-classification system and policy

rates, actuaries will need information to justify their rates to the government, to their company and to the public. Actuaries may need to initiate special studies as privacy restrictions get tougher.

In conclusion, if life companies decide to stay with the sale of individual insurance, the need for actuaries will grow in order to meet the demands that I have outlined. If actuaries branch out into other areas of the life insurance organization, as I believe they should, the need for them will be even more apparent.

MR. BYRON W. STRAIGHT: The forces that will change the affairs of the actuaries are many. Among the more important ones are the general public's ethics and standards. I believe North America is in a period of cultural decay, as such, a reversal is coming where people will look for values rather than appearances. At the present time, the public is looking for an elite form of person who has a solid background. He is not a posturer, nor is he interested in imagery. Now, either the public ethics and standards will make the actuarial profession go in its own direction or the actuarial profession will rebound against it. I believe the profession is going to rebound, through the device of publicizing an elite group of actuaries, one very highly respected group. All actuaries should be great but we should have some elite ones that are recognized by the public as independent, solid citizens.

Among the other forces are the future changes in our clients' needs and our employers' needs. Who can predict what these changes will be? Another force is the force of government requirements. Every level of government from the very top to the very bottom loves to pass laws and regulations that do not raise taxes. We not only have to obey the law under ERISA but we must tell the government that we are obeying the law. We had the same situation in Canada where there are laws that govern the management of pension funds. It is not good enough to obey the law, you must file a report saying you are obeying the law. Apparently the filing is considered by the bureaucrats to be very important. I see no change in the near future and there will be more and more filings.

Some other forces that will affect us are other actuarial organizations. There will be competitions among the various organizations for public recognition in certain areas. Finally the most important force I think that will effect any particular individual is his own desire for professional standing. To this end, we may have to develop some system of recognizing professional status through the English system of titles.

The forces I have discussed will effect profound changes in the characteristics of the profession. Some of them will be eliminated or de-emphasized; others will be enhanced or added.

There will be less posturing and strutting. They are now, I believe, widespread, not just within the profession but probably in almost every form of human endeavor. The great professionals might achieve short term recognition by such actions, but long term valued recognition will be granted to those solid persons who avoid such temptations. A prime example of posturing and strutting is the use of the word 'actuarial' before another word in order to sound important, like an actuarial assumption or an actuarial funding method. These are just manifestations of people trying to seek status by using labels without definite references. We

should be known by the fine work that we do and not by the labels.

There will be more reliance on examinations to prove our status and our ability and less on the school of hard knocks. People will not accept an actuary for a difficult job now unless he is suitably trained and can demonstrate it. There will be less bias in the provision of consulting services. We have quite a few actuaries in the consulting field who act as adversaries. I think that is healthy and I hope that continues. We will see less and less bias answer, but if necessary, two answers will be given saying which one is correct and leave room for the other. In negotiated pension plans where there are usually equal numbers of employer and employee appointed trustees, they are forever trying to play confidential games of getting the consulting actuaries to put out bias results. Sometimes it is the fright of losing the account and we have to be prepared to lose the account. We must be more independent in the future.

In term of work, there will be a much greater variety and therefore there will be a higher degree of specialization. We will be used less and less for routine actuarial work and more and more for advise. I think this will upgrade us. We will need more training or skill in verbal and written communication and computer usage. Because of the diversification of the actuarial profession, there will be a stronger need for peer review. Finally, I hope you will agree with me that we will have a powerful elite in our profession.

MR. WARREN R. ADAMS: In order to understand anything about what the future might hold, I really needed to understand the past. So I decided to look at the actuary of the past, the actuary of the present and see whether or not that would give me any insights into what actuary might do in the future. It gave me some amusing insights. I reached a point where I felt a certain amount of pride because the profession has come so far from what I saw the actuary have been in the past. It led me to believe that there are many very good things in the future in terms of his work and his lifestyle. With respect to each one of these past, present and future actuaries, I will discuss with you about what I see are their practical skills and abilities, what kind of work environment they have, what are their tools, their aspirations and the most significant developments of the period.

Picture the actuary of the past. I will place this person in the period from about 500 B.C. to 1940 A.D. He has a skill which is common to all of us -- we are number magicians. We enjoy, and are very good at, playing with numbers. This particular person is almost strictly an insurance company employee. He works on premiums and, possibly, dividends. He has something to do with reserves. Early in this period there were no cash values, but later on, that were required. He spends a great deal of time trying to do mortality studies and later he also develops some expertise in expense analysis. He has long hours and low pay. His tools early on are very primitive, perhaps the abacus or a pencil. Later on he would have hand crank calculators and clumsy computers. His aspirations are few. He would like to retire sometime. Things that we all accept easily were not easily available to this man. The most significant developments of the period are mortality tables, formal education system, and the formation of the actuarial society of America.

See the actuary of the present. He represents the profession for the period 1940 to 1980. He is also a number magician. Now he may be working for consulting firms. He is designer of financial security programs. There is more sophisticated use of the abilities of this person. He can design actuarial programs for powerful computers. He is more skilled in managerial and communication areas. He has a keener sensitivity to the economic, political, social and legal environments. He works shorter hours but well paid. He spends much time in meetings, traveling, association work and beginning to spend a great deal of time in continuing education. His tools are powerful large computing systems and, in the developmental stage, personal computing devices. Another important tool is the telephone, and jet air travel is indispensable. His aspirations are many. He has more formal education; many of us now think about getting a MBA degree. He would like a more comfortable living, better position in the firm, spends more time alone and with his family, and retirement sometimes at 50 or 55. The most significant development during this period are better training, much better computing power, broader opportunities and responsibilities.

Now imagine the actuary of the future. He will also be a number magician. The consultants will outnumber the company actuaries; there may not be any company actuaries at all. The actuary of the future will make greater application of non-actuarial methods of analysis. There will be greater applications of statistical sampling and inferential techniques. There will be greater use of very well developed forcasting methods. There will be more time spent in research and new and better and more efficient ways to do old jobs and in gaining new insights about the old jobs. This actuary will be well trained in the social sciences and law; he will have an expanded public role. He will be an expert in futurism. He will spend more time in continuing education and association work and more time at home in leisure activities. The reason he is able to do this is because of his tools. He will have a miracle pocket computer. He will have a large personal home computer with ties to the office, to the clients' computers. There will be transcontinental telecommunication devices available, and instead of jet travel, rocket travel. Well, he has almost everything he wants; with respect to retirement, he does not want to retire. There is no need. The significant development of the period will be the advancement of telecommunication systems permitting easy access to the office, clients, and educational opportunities.

In going through this exercise of relating the past, the present, and the future, it helped to reassure me of the protection we have taken by the restructuring of the actuarial examinations. In order that the future and bright scenario for the actuary to become reality, we must recognize the fundamental need for proper educational system. Our goal will continue to be the development of educational opportunities which will prepare the future actuaries and assist them in dealing with an unpredictable future environment.

MR. JOHN S. PEARSON, JR.: Ronna has given us some excellent insights on some of the macro-vectors pulsing through society. My goal is more modest: To paint a few specific pictures of the world in which the actuary of the future might be working. To some extent, the environment determines what we do. What the world is like shapes the roles that actuaries play, the functions they perform, and the tools they use. ERISA comes to mind as a fair example.

My second goal complements the first. It is to try to entertain you by telling stories. The five stories are not true, of course, but they may shed some light on the kinds of problems that actuaries may be dealing with in the future. The first two tales derive from different ideas about the future course of inflation.

STORY #1 WHO TAKES THE RAP?
The first story is motivated by a scenario of continued high and rising rates of inflation. In a special TAP report, issued in 1974, titled Life Insurance Companies and the Impact of Inflation, the writers were quite conservative, imagining inflation to be only 10% in 1979-80, not the 13% or 18% we have experienced. In this kind of environment, we now know, interest rates can run up 500 or 600 basis points in a relatively short period of time.

At some point reality demands recognition. I propose a balance sheet presented in accordance with Realistic Accounting Principles -- RAP for short. Under RAP, assets are valued at market. Thus the interest rate rise lops off 30, 40 or 50% of the value of long-term bonds and a smaller percent off mortgages. Naturally, liabilities will be valued on the same basis, i.e. market. But what is the market value of liabilities? It is suggested, as a first approximation, that cash surrender values might be used to represent market values for permanent insurance policies and deferred annuities. Figure 1 provides a summary. Were Realistic Accounting Principles to be in effect at a point in time when interest rates were high -- say like on March 31, 1980 -- it is not clear that all companies remain solvent. A question you might want to ponder is: Who takes the rap for RAP?

STORY #2 WHO FILLS THE GAP?
My second story is motivated by a different hypothesis about inflationary developments. In this scenario the economic authorities are very successful in bringing inflation under control. In the short span of only two or three years, the Fed brings the rate down to near-zero levels and keeps it there. Interest rates also follow a downward course and stabilize in the $3\frac{1}{2}$ - 4% range. What happens as a result? Bonds are called by the billions and refunded at the lower prevailing rates. Mortgages are also prepaid. The rate on the general account portfolio plunges dramatically. Investment income is cut in half. Thankfully, expenses quit going up. But neither do they fall. They remain constant, but at very high levels.

So now we need to take another look at the balance sheet (Figure 2.) Assets are valued by traditional methods. The accountants, however, take out a sharp pencil and require that losses be recognized. They demand that reserves be revalued using $3\frac{1}{2}$% interest and realistic assumptions as to benefits and, pointedly, expenses. On reflection you may decide that the first balance sheet presented a better picture than the second. Are you sure 'curing' inflation is in the interest of life companies? Who fills the gap under GAAP?

STORY #3 AND HERE COME THE CANNIBALS
Some years ago Jim Anderson presented an intriguing critique of traditional life insurance. He included a description of the Universal Life Insurance Policy, this a revolutionary form with great flexibility and low cost. Essentially the policy involved a variation on 'buy term and invest the difference.' The Universal Life Policy was issued by Cannibal Life. The

FIGURE 1: BALANCE SHEET
RATCHET INFLATION

XYZ LIFE

ASSETS	LIABILITIES
AT	AT
MARKET	MARKET
	≒
	CASH
	VALUES

FIGURE 2: BALANCE SHEET
INFLATION CONTROLLED

XYZ LIFE

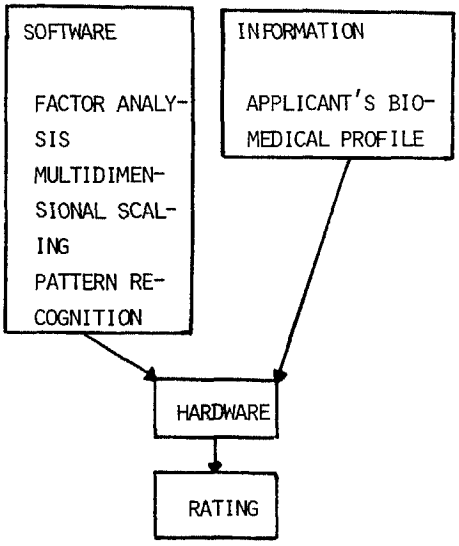
ASSETS	LIABILITIES
VALUED	INTEREST: 3½%
TRADITIONALLY	BENEFITS: REAL
	EXPENSES: REAL

FIGURE 3: BALANCE SHEET

CANNIBAL LIFE

ASSETS = 0	LIABILITIES = 0

FIGURE 4: UNDERWRITING FLOW



scheme might be implemented today in a slightly different form. Cannibal Life starts or acquires a money market fund. Fund-holders are permitted to buy term insurance financed by daily charges against the fund. Cannibal Life's balance sheet, of course, is very simple, requiring the services of neither actuaries or accountants (Figure 3.) Enough of horror stories! Let's move into the realm of fantasy.

STORY #4 UNDERWHELMING THE UNDERWRITERS

Actuaries have traditionally played a role in the underwriting process; not as case underwriters, but as compilers of experience studies, setters of rates, and so on. It is possible we could do much more. Application of some new mathematical-statistical tools might enable us to completely revamp the process. The general approach is outlined in Figure 4. A sophisticated computer uses factor analysis, multiple dimensional scaling, and pattern recognition techniques to scan the results of an individual's paramedical examination. It assigns debits and credits and rates the applicant.

Of course, really advanced installations will have really advanced features, including voice recognition and voice synthesis capabiliities. The computers will be able to talk and to listen. These will enable it to respond directly when an irate agent calls up to dispute a rating decision. Predictably, the field force will respond by programming their personal computers to handle the negotiations.

I hear an objection. I hear Roy Anderson. He says that just about the time the system is ready to go on-line, the states will have passed laws prohibiting risk classification. Oh well, it was only fantasy anyway.

STORY #5 FOUR EYES ARE BETTER THAN TWO

The actuarial profession has defied the 'Limits to Growth.' Not by our numbers but by our rules. We proscribe, prescribe, subscribe, and circumscribe. We may even be scribes. In the Academy YEAR BOOK the Bylaws, Gudies, Opinions, Recommendations, and Interpretations now consume an incredible 118 pages. The Society, on the other hand, requires only 12 pages for its Constitution, Bylaws, Guides, and Opinions. To the casual observer this seems like an improvement. It is not. Because the page size is much larger, and the print is much smaller. One insensitive wag suggested that the Society send out a magnifying glass with each copy.

With all this reading to do, the actuary himself must evolve if he is to survive. Hence the title of the last story is: FOUR EYES ARE BETTER THAN TWO.

MS. MA ROSARIO RODOLFO: Several speakers here made the point that communications will be very important to the actuary of the future for various reasons, one of them being legislation. Someone has to explain to all the legislators what we are doing and what we are all about. It was also pointed out that it will probably not be on the syllabus. So how are we going to get this ability to communicate?

MR. ADAMS: No serious consideration has been given to reinstituting the old part one although some think it would be a good idea. I think it will happen. We will have to retrain ourselves to acquire those abilities. Perhaps the marketplace will just keep out those who do not have those abilities.

MS. RODOLFO: Another area the actuary is lacking is the art or science of being manager, because we are so highly trained in the technical aspects of our work. We spend a lot of time studing for examinations that we end up being poor managers.

MR. ADAMS: I have not been persuaded that you can teach people how to manage. I do not know if it is an acquired skill or something you are born with.

MR. LEE R. LAMBERT: Some people are predicting a partial doom in that the government expanded programs in Social Security and other areas will drastically reduce the future needs for actuaries.

MS. KLINGENBERG: My suggestion was not that it would reduce the need for actuaries. But given the traditional employment patterns and given the percentage of actuaries that are employed by private companies, there will be a certain displacement. There has been an enormous growth in the number of people employed by government but the growth has been primarily by state and not by the Federal government.

MR. STRAIGHT: In Canada we have had the governments interfered with the private work of the actuaries and the result of the interference was more work for actuaries. I think bringing the government into the business does not automatically mean that there is less actuarial work because at the least, the government will then need more actuaries.

MR. ADAMS: Instead of discussing government interference, perhaps we should spend time speculating on the possibility of a decreased government role in providing financial security for individuals. I base my suggestion on the apparent dissatisfaction with the Social Security system particularly among young people.

MS. KLINGENBERG: We do a survey called Monitoring Attitudes of the Public where we ask questions of the general population about Social Security. While people continue to say that they dislike big government, there is a general acceptance of the idea of Social Security. Young people say they do not mind paying more for Social Security than the older people. This is so even they suspect that the system will not produce the same results for them. There is no indication that would lead me to believe that there will be less government regulation.

MR. PEARSON: There seems to be a trend towards an increase in socialization of risk of all sorts. If there is a flood the federal government would come in; if there is a riot the Federal government would come in. In the past, getting rid of risk was an individual's function. Now we want to socialize risks; we want a riskless society. We might try to deregulate but I do not see us bucking the trend toward socialization of risk so that the individuals feel the brunt of the risks less and less.

MR. DOUGLAS DRAESEKE: Mr. Pearson, you talked about interest rates coming under control because the government finds a way to control the supply of money. I do believe that we are going to see a 3½% interest rate for the coming years, not because of what the government does but because it cannot prevent severe deflation. Under this senario then, I think expenses could go down drastically.

MR. PEARSON: In my senario I was not really predicting a deflation although that might be the initial cause of things. The ideal condition will be one where the rate of inflation is reduced but not the rate of growth. Prices will no longer be increasing but remain economy-wide constant. And historically when you have no price increases, interest rates in the range of 3 to 4% are not unrealistic.

MR. HENRY HEINZBERGER: I can remember very well in the 30s when there was an enormous deflation. We have so many controls now. I am inclined to agree with Mr. Pearson that interest rates could go down without being accompanied by a severe deflation. The cost of labor certainly will go down fighting. The actuaries should plan for the contingency of reduced interest rates but without the relieve of reduced expenses. I think this is a problem that we may have to face in the next ten or fifteen years.

I would also like to respond to another issue. Mr. Straight suggested a group of elite actuaries. As most of us go into the business, we go in with rather stringent standards of scholarship. A number of the actuaries then expand their boundaries by studying law, accounting or economics. They tend to become generalists. I would think these generalists will emerge as the elite group because of their own initiative. There lies the difficulty in picking out and recognizing the elite group because they emerge only after years of experience and through their own efforts.

MR. RICHARD A. BURROWS: Along the same line, I might say that at Philadelphia Life we have an actuarial rotation program where students are assigned to non-actuarial functions such as Systems and Marketing. This type of training program will allow the exposure for development. You may not be able to teach someone to be a manager but you can let him learn in a proper arena.