

# **RECORD OF SOCIETY OF ACTUARIES**

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### **FUTURISM AND DEMOGRAPHIC TRENDS**

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MR. ROY R. ANDERSON: One of the real joys of my professional life has been the opportunity to serve as Chairman of the Committee on Futurism for the past two years. I would welcome continuing in that capacity -- but because I believe in change, I also believe that the chairmanship should change as well as the membership. We should have a continual influx of members with new ideas and perceptions. So next year, the committee will be taken over by Wil Kraegel, the person who has really been doing a major portion of the work. Because of this, I might have less opportunity in the future to say some of the things I would like to say, so I am going to use this occasion to give you some of my thoughts on futurism.

What is Futurism? The most essential ingredient in what is called futurism (and that may be the wrong word for what this is all about) is not looking into the future or forecasting the future; rather, it is the ability to perceive the realities of the present. What is happening in our business portends great changes in the future. In many instances, it is not the distant future. It is already in the cards that are on the table, if you just would look at those cards the way they have already been dealt. Being able to see the cards is my perception of what futurism is all about.

How do futurists tend to get to these perceptions? Let me summarize several phases that one tends to pass through in the process of becoming whatever a futurist is.

The first and most dominant characteristic of futurists is a deep concern with problems of a global nature -- the conviction that mankind is facing problems of a magnitude greater than any faced before. I have just received a book, "The Seventh Enemy" by Ronald Higgins, a futurist in England. Higgins identifies the first six enemies as overpopulation; famine; resource shortage; environmental degradation (the pollutants); nuclear abuse; and technologies racing beyond control. These are similar to the problems that the Club of Rome identified as the "world problematique".

The second perception of futurists is that civilization is undergoing a fundamental transformation -- that we are in a period when we are developing new values, new beliefs, and new perceptions of reality. Old institutions are undergoing traumatic and discontinuous change; new institutions are being formed. Perhaps it is a self-fulfilling prophecy, but as events have tumbled upon us, I see more and more evidence of this kind of historic transformation in mankind. Things are happening so fast and so deep they almost boggle the mind -- and it is difficult to place their significance in proper context.

The third is the realization that no one is facing up to the global problems. This third phase hit me four years ago during the oil shortage. I had identified the "world problematique" back in 1970 when I wrote a paper on what the insurance business might be like in the Year 2000. I assumed that

someone was doing something about it. When I sat in long lines of cars waiting to get gas during the oil crisis, it dawned on me that nobody was doing anything about the global problems -- or even doing much thinking or planning about them. So this is another perception I think the great majority of the futurists share: no government -- no corporation -- no one is really facing up to these global problems. They talk a lot about them and declare the "moral equivalent of war" on some of them -- but nothing really happens.

Now let us look at the next statement in "The Seventh Enemy". Theoretically, the six enemies -- or challenges -- are not beyond us. But have we the time, or the will, or the capacity to organize? It is the human factor that the author identifies as our seventh enemy. (In the immortal words of Pogo, "We have met the enemy and he is us".) The inertia of our political institution and our own obstinacy (individual blindness to late 20th Century realities) is frightening. I find this not only in the "world problematique" and what is happening throughout the world, but also right in our own business of insurance.

The fourth is analyzing people's behavior. To me, it is self-evident that some of our systems have now reached the point of discontinuity and require more than band-aids. In my view, the leadership of our business of insurance continues to look for bigger band-aids to try to keep the system going a little longer. Now we pass into another phase of inquiry that virtually all futurists are involved in -- that is, how does the mind work and what makes people behave the way they do? Why is it so difficult to perceive reality?

As I mentioned earlier, we are in a period when basic beliefs and values are changing. But -- perhaps more fundamentally -- our perceptions of reality are also changing. Gradually, more and more people are beginning to see things differently; their capacity of being able to perceive reality is being improved and enhanced. But for such people who gain these insights, it takes a while to realize that other people can actually have the evidence right under their nose and still not see it. They deny it is there -- because, subconsciously, they do not want to see it. The evidence is too threatening to their system. And even after they do see the evidence of change, they still have difficulty retaining it. Because of the way the mind works, it is possible to forget such evidence because it is discordant and threatening to your system. And even after you have retained the knowledge, you have got to have the mental discipline to work out the solution. And when you finally get around to figuring out what the solution is, many lack the will to do anything about it. Much of this has to do with the concept of the paradigm -- a concept introduced by Thomas Kuhn about 20 years ago in his classic book, "The Structure of Scientific Revolutions".

"Left-brain" and "right-brain" thinking. Another fascinating aspect of how the mind works is that of the contracting workings of the "left-brain" and the "right-brain (the left hemisphere and the right hemisphere). It is commonly recognized now that there are two hemispheres operating differently. The left hemisphere is known as the Cartesian logic; linear, and scientific type of thought process that is the foundation of our actuarial science with which all of us are so comfortable. This is referred to as the masculine side. The right hemisphere of the brain is called the feminine side -- the intuitive, artistic, holistic type of thought process. It is a circular type of thinking. If you wonder why husbands sometimes claim that their

wives drive them crazy with their non-logical thought process, it is because wives seem to think and talk in circles and then -- from out of nowhere -- come up with an answer that proves to be right. This is characteristic of the intuitive, feminine-type thinking.

I learned something quite interesting from the questionnaire the Society membership completed several weeks ago. I attended an informal meeting of strategic planners out in Stanford Research Institute. It included strategic planners for companies such as Monsanto, Sears, DuPont, AT&T, Coca-Cola, Boeing Aircraft, and many more. I received sixteen answers on the question pertaining to the significance of "non-normal conception", such as the baby born in England that was conceived in a test tube. The question was:

"By 1990, the total impact of the introduction of these various forms of 'non-normal' conceptions will be significant enough to then affect projections of future demographic trends -- e.g., birth rates beyond 1990; family composition; etc. Do you agree or disagree?"

The vote of the sixteen people was 13 to 3 saying that, in 1990, we would not have to consider such pregnancies in making demographic projections. The results for the membership of our Society was similar -- something like 87% to 13%. There were two ladies among the sixteen strategic planners. The vote for the men was 13 to 1. For the women, it was 0 to 2 -- that is, they felt that "non-normal" conceptions would become significant, demographic factors. The next day I commented to the group that our main purpose for meeting is to figure how to detect the "blips on the radar screen" that tell us that something significant is happening. I said that the vote we had taken the prior day was in itself something that we ought to be looking at. The men said that "non-normal" conceptions were not going to be worth thinking about. The two ladies (who might have a little bit more to do with it) decided that, yes, it was going to be significant. That is the kind of blip on the radar screen we should be paying attention to. I suggested that fifteen or twenty years ago when the pill came along, the demographers and the forecasters did not realize what would be the major impact of the pill -- that is, the pill became important not so much for the effect it would have on birth control, but on the whole structure of family values and on the nuclear family. The pill has had a tremendous effect on the basic values of society.

This has taught me that if we want to do any kind of meaningful, strategic planning, we had better get the ladies into the act because we need their perceptions. In the past, we male actuarial types have probably been missing the boat fairly often in perceiving the problems that have been going on in our society because we have lacked the kind of intuition and guidance that, fortunately, we are now beginning to get from the ladies. This gives you a different perception of the "equal opportunity" issue. We should have the ladies as a part of our management, not to be gallant or because they are prettier looking, but because they have something quite valuable to contribute which our type of male-dominant civilization has been losing for hundreds of years.

MR. BERNARD R. RITTERBUSH: My remarks will cover three areas. To begin, I will describe the Delphi technique, since one of the purposes of the questionnaire undertaken by the Committee on Futurism for this session was to introduce the membership to this concept. Then, I will summarize the results of our questionnaire on demographic trends. Finally, I will offer some observations about the results and their implications for the private sector of the insurance industry.

The Delphi Technique - In discussing a subject such as the Delphi technique before a group of actuaries, it is typical to begin with a detailed, explicit definition of the subject. I have yet to find such a definition. The absence of a definition is probably due to two factors.

First, the technique is still in its infancy, having originated in the early 1950's at the Rand Corporation as a defense study to estimate the probable effects of a massive Soviet attack on the U.S.

Second, the technique and its application are still in a period of evolution, both with respect to how it is applied and the subjects to which it is applied. While the principal area of application has been in technological forecasting, it has been used in many other contexts in which judgemental information is indispensable. A good example of this is in the "health care" evaluation area, which I understand has a number of Delphi practitioners.

In spite of this evolutionary infancy, an acceptable definition of the Delphi technique can be given if a broad enough view is taken in looking for the common thread of the thousands of Delphi studies conducted since its inception. Quoting the book, The Delphi Method, edited by Harold Linstone and Murray Turoff, "Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem."

Four ingredients are typically present to accomplish this "structuring of communication":

1. Some feedback of individual contributions of information and knowledge;
2. Some assessment of the group judgement or view;
3. Some opportunity for individuals to revise views; and
4. Some degree of anonymity for the individual responses.

These ingredients can be seen in the four phases of a typical Delphi process, each of which provides for anonymity.

Phase 1: Exploration of the subject under discussion - Each panelist in the respondent group receives general instructions and responds with additional information he feels is pertinent to the issue. This information would include such items as events, trends, etc., which are relevant to the issue.

Phase 2: Gathering group opinion - Panelists receive the list of items generated in the first phase. They respond with "estimates" for each item. An estimate for a given item might reflect one or more of (1) the extent of agreement or disagreement with it; (2) the probability of it occurring; (3) the date on which it will occur; or (4) the extent to which it will occur.

Phase 3: Feedback and exploration of disagreement - Panelists receive the list of items and statistical results such as medians and quartiles of the estimates made in the second phase. Significant disagreements are explored to bring out the underlying reasons for the differences. This is done by asking panelists to respond with statements supporting the "outlying" or extreme estimates and/or to revise their estimates.

This phase might be repeated one or more times. Each time the panelists would receive the list of items, revised medians and quartiles, and summaries of the statements obtained thus far. They would respond with revised estimates, additional supporting statements, and comments on the statements of other panelists.

Phase 4: Final Evaluation - The final panel viewpoint is presented statistically, not as a majority vote. The degree of disagreement among panel members is displayed explicitly, and every panel member's position is reflected in the final statement.

The process may be short-cut by prestructuring the subject to be discussed, then starting at the second or opinion gathering phase and completing only one round of feedback and revision of the estimate. That is essentially what we will have done with our questionnaire. However, it is important to note that for our questionnaire, the group completing the second round is not the same as the group which completed the first round. This is a major departure from a true Delphi and should be kept in mind as the results of the two rounds are compared.

When viewed as a communication process, there are few areas of human endeavor which are not candidates for application of Delphi. Even within our own companies, Delphi could be used for such things as strategic planning, evaluating possible budget allocations, and setting priorities.

In general, it is not the nature or subject of the application which determines the appropriateness of utilizing the Delphi technique. Rather, it is the nature of the communication process required by the problem under consideration. This nature can be found by asking: "Who is it that should communicate about the problem, what alternative mechanisms are available for that communication, and what can we expect to obtain with these alternatives."

Some of the alternatives with which we are all familiar are committee meetings, formal conferences or seminars, and conference telephone calls. To varying degrees, however, these alternatives have disadvantages associated

with the size group that can effectively be involved, travel time and cost, participant inhibition, personality clashes, undue influence or domination by some individual or group, etc. Delphi is an attractive alternative when one or more of these disadvantages is an important consideration. Obviously seeking input from the Society membership on a broad or complex problem is well suited to the Delphi technique.

Before summarizing the results of our questionnaire, let me briefly list some of the basic pitfalls in using Delphi which Linstone identifies. Some of these undoubtedly are reflected in our results.

1. Discounting the future - Most people have a very short planning horizon as well as a short memory. Occurrences which appear to be far removed from the present are heavily discounted. It is not surprising that cries of crisis are ignored and questioning about future goals and values may prove frustrating.
2. The predilection urge - Most people have a strong predilection for certainty and a dislike of uncertainty. Consequently, Delphi results which exhibit a high degree of convergence are often accepted, while those which involve wide differences are considered unusable.
3. The simplification urge - Simplicity is preferred to complexity. We expect to use the same reductionist approach on social/behavioral systems that we used on technological ones. But the tools of classical science are usually inadequate for such complex systems. In fact, these systems frequently exhibit strongly counter-intuitive behavior. The future must be viewed holistically rather than by taking one or a few innovations and mentally fitting them into an environment otherwise structured from the familiar past and present.
4. Illusory expertise - The specialist is not necessarily the best forecaster because the specialist focuses on a subsystem and frequently takes no account of the larger system. Then too, a dogmatic desire for conformity often swamps the single maverick who may actually have better insight than the rest of the "experts" who all agree with each other.
5. Sloppy execution - Examples of this include poor selection of participants, poor interaction between participant and analyst, vagueness in the Delphi statements, superficial analysis of the responses, and respondents answering without adequate thought.
6. Optimism - pessimism bias - A common occurrence is a bias toward overpessimism in long-range forecasts and overoptimism in short-range forecasts.
7. Overselling - Delphi may be overused both in improper applications and in repeated studies on the same subject.

8. Deception - The Delphi process is not immune to manipulation or propaganda use.

When all is said and done, remember that the outcome is nothing more than opinion. The results are only as good as the opinions of the experts who contributed them and the success of the analysts who conducted the Delphi in avoiding these pitfalls.

The Results of the Questionnaire - Reproduced below are the letter and questionnaire sent to the membership in August, 1978 followed by the tabulated replies.

To: Members of the Society of Actuaries

In re: Questionnaire - Demographic Trends

The Committee on Futurism of the Society of Actuaries is sponsoring Concurrent Session K during the Annual Meeting on the subject, "Futurism and Demographic Trends". In preparation for that session, we ask that you complete the accompanying questionnaire -- whether or not you intend to attend the meeting or the session.

The purpose of this questionnaire is to introduce the membership to the concept of the "Delphi" technique -- a procedure that was developed some years ago by futurists to sample the informed judgement of experts in a given field as to the likelihood of future events. The results of this questionnaire will be presented at the Concurrent Session. Then, at the end of the session, the audience will be asked to complete the same questionnaire on the basis of the perspectives they gained during the meeting. The results of the two responses will be posted on the notice board.

This process we are using is not, strictly speaking, the Delphi method, but we hope that it proves to be illustrative and informative. Further, the results of the questionnaire will not be released publicly as a "survey" of the membership. The survey is intended simply to get us thinking about demographic trends -- and to try out the questionnaire technique for possible future use.

Complete the questionnaire by circling the numbers on the postcard - and please mail it without delay.

COMMITTEE ON FUTURISM

August 1978

Demographic Trends

(Questionnaire Sponsored by the Committee on Futurism)

All questions relate to the Year 1990. Tables referred to in the

questions are those contained in the Rappaport/Plumley paper, "The Impact of Social and Economic Changes on Financial Security Systems" that was recently distributed to the membership. However, it is not necessary to have read the paper to complete this questionnaire.

Complete the questionnaire by circling the numbers in the enclosed postcard.

- A. Family Structure. Evidence of the deterioration in the stability of the nuclear family may be found in the doubling of the divorce rate from the mid-1960's to 1976. (2.5 per 1000 population to 5.0 -- see Table 9.) For 1990, this rate per 1000 will be:

1. Under 3.0                  2. 3.0 to 5.0                  3. 5.1 to 7.5  
4. 7.6 to 10.0                5. Over 10.0

- B. Birth Rates. Table 4 indicates that the Total Fertility Rate declined substantially (roughly, by one-third) from the mid-1960's to 1974. Relative to the rate for 1974, the rate for 1990 will be:

1. More than 15.0% lower                  2. 5.1% to 15.0% lower  
3. From -5.0% to 5.0%                    4. 5.1% to 15.0% higher  
5. Over 15.0% higher

- C. Mortality. Table 6 shows little improvement in mortality for the adult ages of 25-64 between 1960 and 1970 for Females -- and between 1950 and 1970 for Males. The following are two statements concerning trends in mortality in the age 25-64 group between 1978 and 1990 (Ans. Q's C.a and C.b):

C.a There will be significant improvements due to discoveries in scientific medicine (e.g., cures for cancer or hypertension)

C.b There will be significant improvements due to changes in "life-style" (e.g., personal programs of physical fitness; improved dietary habits; avoidance of cigarettes, drugs and alcohol; stress reduction practices; etc.).

1. Disagree strongly. 2. Disagree moderately 3. No opinion.  
4. Agree moderately. 5. Agree strongly.

- D. Retirement Age. For decades the general trend has been for individuals to seek early retirement. (See Table 2.) Recently a counter-force has developed, due in some measure to the effect of inflation. Relative to the proportions of persons over age 65 in the work force for 1975 (20.8% for males and 7.8% for females), the proportions in 1990 will be:

1. Substantially lower. 2. Moderately lower. 3. About the same  
 4. Moderately higher. 5. Substantially higher.
- E. Inflation. The average annual rate of inflation between 1978 and  
 and 1990 will be:
1. Zero or less. 2. 0.1 to 3.0 3. 3.1 to 6.0  
 4. 6.1 to 10.0 5. Over 10.0
- F. "Non-normal" Conceptions. Recently a baby was born to a  
 husband and wife in England that was "conceived" in a  
 test tube and then implanted in the womb of the wife.  
 This suggests the possibility of other types of such  
 "non-normal" conceptions. Another possibility is the  
 predetermining of sex of the child. Even more unusual  
 would be births resulting from cloning or from techni-  
 ques learned from DNA research.
- By 1990, the total impact of the introduction of these  
 various forms of "non-normal" conceptions will be signi-  
 ficant enough to then affect projections of future  
 demographic trends - e.g., birth rates beyond 1990;  
 family composition; etc.
1. Disagree strongly. 2. Disagree moderately. 3. No opinion  
 4. Agree moderately. 5. Agree strongly

## REPLIES TO AUGUST, 1978 QUESTIONNAIRE

Question	Answer -- %					Total Replies
	1	2	3	4	5	
A. Family Structure	4.6	31.9	45.7	13.4	4.4	3,277
B. Birth Rates	7.1	25.2	48.9	16.6	2.2	3,276
C.a Mortality (science)	7.0	34.8	4.4	44.8	9.0	3,276
C.b Mortality (life-style)	14.1	37.7	4.3	36.1	7.8	3,270
D. Retirement Age	1.7	11.2	18.1	54.4	14.6	3,264
E. Inflation	0.2	1.4	36.7	61.6	0.1	3,144
F. "Non-normal" Conceptions	50.0	33.4	4.6	10.2	1.8	3,276

Observations - I would like to comment on the replies to this questionnaire. I hope these comments will stimulate people in the audience to challenge or defend some of the replies they made. Recall that the third phase of a Delphi involves exploring the differences in the initial estimates.

1. On question A, the responses appear to be normally distributed. However, keep in mind that the current situation is between replies 2 and 3. For the 37% who responded 1 or 2, what forces are at work to reverse the present trend? Conversely, why do 17% of you see a substantial acceleration of the trend?
2. Similar questions could be asked about question B where 32% saw significant further declines in the fertility rate, while 19% thought fertility rates would move back upward significantly. I wondered if, in answering this question, people realized that present fertility rates are below the zero population growth or replacement level and that it would require more than a 15% increase in the fertility rate just to have zero population growth under current mortality conditions.
3. There are obviously differences to be explored in the replies to questions C.a. and C.b. It is important to note that changes in "life-style" received nearly as much support as scientific medicine as the cause for future significant improvements in mortality.
4. On question D, the current situation is response 3. Why did 13% of you feel that the proportion of persons over age 65 who remain in the work force will decrease? Why did 15% say it would increase substantially?
5. Question E on inflation had the greatest concentration of agreement. But for those 62% of us who responded that annual inflation would be 6-10%, were we guilty of the pitfall of discounting the future - of remembering only the recent past? Also, about 125 fewer people responded to this question than the others.
6. Finally, was question F worded carefully enough, and if so, was it read carefully enough? To me, the question did not ask whether "non-normal" conceptions will have affected the demographics of 1990. Rather, it asked whether "non-normal" conceptions would affect the future demographic projections made in 1990. It would be analogous to asking whether the impact of the introduction of birth control pills should have affected demographic projections made in the early 1960's. I wonder, also, how much the replies differed between women and men.

What are the implications of these trends for the insurance industry? This question posed some difficulty for me at the outset, since my personal interest in futurism focuses primarily on global conditions of politics, population, food, energy, resources, climate, etc. - on the world situation, in short - and on the profound significance of many current events and

trends in the light of Biblical prophecy. To look only at demographic changes and their impact on the insurance industry in North America ignores too much of the total picture in just the U.S. and Canada, let alone the world. But after questioning the other members of the Committee, let me toss out what came together in my mind and see what kind of discussion it generates.

As a preface, let me note that we should not be surprised if there are notable differences in the future birth and mortality trends of Canada vis-a-vis the U.S. For example, the Canadian population situation is such that serious consideration is being given to increasing fertility rates.

Divorce rates will continue to increase but the family will survive. The need for recognition and belonging is too strong to kill the family. However, the family may only be stable during the child-rearing years as young adults "try" several marriages, legal or otherwise, before committing to a partner with whom to raise children and then return to serial marriages after the children are reared. This scenario is congruent with the trend to later marriages and fewer children. The instability before marriage could well result in the postponement of the purchase of life insurance, and the instability after child rearing could lessen the sense of responsibility for providing for others during those later years. This suggests still greater movement toward term insurance.

Smaller families will mean a larger portion of a wage earner's income is used for his or her personal expenses. Thus, the relative insurance coverage needed for one's dependents will be less. On the other hand, we should see a larger part of that need actually met as smaller families increase the share of income available to pay for insurance.

I believe birth rates will remain low by historical standards. An extreme counter-intuitive phenomenon would seem to be required for the future to be otherwise. There are just so many things telling people to have small families, not the least of which are inflation, women's liberation and the declining optimism about the future and the ability of our institutions to deal with it.

The low birth rates will force an increase in the age at which people retire. The financial soundness of the Social Security system, and perhaps, private pension plans will require it. Moreover, the desire for continued economic growth in the face of relatively smaller numbers of young people entering the labor force will force business to make it financially appealing to continue to work. This suggests a lessening of the need for retirement savings.

This feeling of less need to save for retirement would be minor compared to the feeling of inability to save if we have the 6-10% inflation most of you expect. Saving will seem futile. That combined with the need for retirement benefits to increase with inflation will result in greater turning to government as the only means of closing the gap. Only government can redress the losses due to inflation. Mr. Robertson can comment better than I on the impact of this added strain on our social insurance systems. For myself, I conclude that continuing inflation of 6-10% simply cannot be permitted to occur and Americans will accept the consequences of curbing inflation, unpleasant as they may be.

In closing, let me expand our view for at least a few moments. This session is focusing on demographics because that is something most actuaries relate to and feel is a part of their world. But I believe actuaries must see themselves as more than mathematicians dealing only in hard facts and figures. Our thinking must become much more vibrant, lively, zesty, if you will. We must see our world as being much larger.

Demographic trends are not merely rates and numbers. They are one of the mirrors reflecting the thinking of a society, its values, its attitudes, its hopes and fears.

So if demographic trends have a profound impact on us and our industry - and there is little doubt they do - we must understand these trends. To do so, we must try to understand the values and attitudes of the society which is choosing or not choosing to have children, choosing or not choosing to marry, choosing or not choosing to work. To understand that, we in turn, must understand the things which create and shape those values and choices. At the most basic level, might we not need to understand man's view of himself, his place in this universe and the fundamental things for which he is striving.

We are seemingly in the midst of a period of transition and great change. Yet if we really get down to the basics of mankind, are we really at a turning point? Might we find at that level that there really is nothing new under the sun? I wonder.

MR. ANDERSON: We received over a 50% return on the questionnaire, which I think was a stunning response. It tells me that our members are far more interested in futurism and demographic trends than I had imagined. Perhaps our committee has not been as effective and as active as we should have been in the last couple of years in light of this very wholesome response.

MS. ANNA M. RAPPAPORT: I have been asked to address the question: What do these demographic trends mean for pension plans?

I have chosen to expand the question to focus separately on the participants and plan sponsors, and wish to restate it as follows:

How well will pension plans based on today's design meet the needs of plan participants in the future, and what changes will be needed to accommodate participant and plan sponsor needs?

The plans as they exist today probably will not fit very well because of the changes taking place in society.

Retirement patterns will surely change, and the way the life cycle is divided between periods of work and non-work will probably also change. Some of the changes needed will be:

- Method of handling a period of non-work prior to final retirement.
- Method of handling partial retirement.
- Method of providing benefits which are reasonable in level for retirements at a wide range of ages.

Inflation is creating problems for the active worker, the retiree, and for employers and taxpayers in the funding of retirement benefits. Adequate retirement benefits in the face of continuing inflation will be a persistent problem. Some of the possible developments are:

- Mandated post retirement and post termination of employment cost of living increases.
- Mandated past service updates in career average plans.
- Increases in the retirement age to ease cost pressures.
- More turning to fixed income investments, or searching for investments which perform well during inflationary periods.
- Employer conservatism in expanding pension plans, accompanied by growth in thrift plans with the employer matching all or part of employee contributions.
- Termination of defined benefit plans with the replacement being a defined contribution plan. This shifts many of the risks from employer to employee.

Employee rights will be further defined, and some of that definition of rights will be reflected in minimum standards for pension plans. Vesting requirements on death and termination will be stricter so that earlier vesting will be required, and some cost of living protection may be mandated. We can expect increased concern on how well plans fit the needs for employees who change jobs or careers several times during their lives.

Changing family patterns require rethinking of entitlement to benefits. Do spouse benefits make sense in a world where more than half the families have two spouses working? Do they make sense when many couples may choose not to legally marry? Do they make sense when divorce is common, and when the spouse during the working years may not be the spouse when benefits are payable? The question of entitlement to pension benefits in divorce actions is increasingly being focused on in the courts today. What will happen if family units include more than two adults? How should dependent parents be provided for? Dependent parents are becoming an increasing problem.

From the employer's point of view, the pension plan may be another tool for use in human resources management. If mandatory retirement is banned, the pension plan will become an important tool for encouraging the employee to retire. Retirement policy will be important and the employer will need to focus on benefit levels as a means of encouraging specific behaviors.

In summary, I believe that the plans in effect today will have to be changed to meet the needs of participants better because of these developments:

- Changing retirement patterns
- Changing family economic structure, and lifetime family patterns

- Job mobility
- Increased recognition of employee rights
- Inflation
- Freedom to choose when to retire.

MR. A. HAEWORTH ROBERTSON: Some 20 years ago I made a talk in Galveston, Texas about the effect of automatic cost-of-living increases for teachers' pensions and what might happen if they became widespread. I thought I made a number of important observations, but when I was through one of the more astute members said my talk reminded him of the question, "How long is a piece of string?" Some of the things I will say today and perhaps some of the things our panelists have said may evoke a similar comment since we are not going to tell you exactly what the future holds -- because we do not really know what lies ahead. Actually, some of us do, but if we told you, you would not believe us. And that is not as facetious as it may appear. I frequently maintain that if we really did know what lay ahead and if we made our projections on that basis, it would be to no avail unless the assumptions and the results were generally accepted by the people who have to act on them.

I think many of us have lacked the courage (if that is the correct word) to make assumptions along the lines we really thought we should. I would suggest that was probably true in the area of projecting cost-of-living changes. I can recall when, not too many years ago, many of us were not assuming very large changes in future wages at a time when it was evident that wages were in fact increasing faster than we were assuming and when there appeared to be no reversal of the trend in sight. But for some reason we did not seem to have the courage to make these assumptions, presumably because they would have seemed unreasonable to the consumer and would have produced high costs which may not have been believable (and certainly would have been received with displeasure).

Accordingly, our intention today is not to tell you what will happen in the future, but to attempt to stimulate you to think about the future in a different way than you have in the past, so that from your standpoint the future would not be what it used to be.

First I would like to call your attention to the tax rates scheduled in the Social Security system after the amendments of 1977, and to a likely divergence in future years in these scheduled tax rates and the tax rates that will probably be necessary. This will lay the groundwork for some of my future comments.

Most of you know that the Social Security tax rate in 1978 is 6.05% of taxable payroll, payable by the employer as well as the employee. And you know you pay taxes on your covered earnings up to \$17,700 this year. You probably know that 85% of the total earnings of people in covered employment under Social Security is subjected to the Social Security tax and that 86% of the people have all of their earnings so taxed. And you probably know that by 1981, according to present law, the maximum contribution and benefit base is scheduled to increase to \$29,700 and that we will then be taxing 91% of all earnings of persons in covered employment and we will be

taxing all of the earnings of 94% of such persons. And you are probably also aware that the contribution and benefit base will continue to increase thereafter in accordance with changes in average wages and these figures (91% of all earnings and all of the earnings of 94% of the people) will continue to prevail after 1981 assuming no change in the law. You probably also know that the tax rate is scheduled to increase in steps from 6.05% to 7.65% by the year 1990 and stay level thereafter. And you may or may not be aware that some of the more recent projections made by the Office of the Actuary of the Social Security Administration indicate that would not be enough. Based on the present law, the tax rate will have to continue to rise to some 8% by the year 2000 and about 12% by the year 2025.

But Social Security is only one part of a myriad of benefit systems which have grown up over the years in our attempts to satisfy the needs generated by an individual's illness, death, disability, or old age. It is my opinion that a careful study of Social Security and all of these plans would indicate many gaps in coverage, many duplications in coverage, and a future cost for all of these systems combined which is not compatible with our present social and economic structure.

Now will these projected costs actually materialize? No; for a variety of reasons not the least of which is that since the future costs of these various income maintenance programs appear to be an unsustainable burden, we will probably change the programs or change our social and economic behavior so that they will be sustainable. And is that not indeed the purpose of our actuarial projections -- to project the future consequences of action taken today to determine whether or not such action is appropriate; and, if it is not, to take different action, to make different decisions, so that we can live with the consequences of our decisions.

Our topic today is "Demographic Trends." Demographic trends will account for a large part of this projected high cost of the Social Security program. Today we have some 31 beneficiaries for every 100 taxpayers. Within 50 years we will have 52 or 53 beneficiaries for every 100 taxpayers. Costs have to increase because of demographic trends. But demographic trends do not operate in a vacuum. Consider this possible chain reaction.

Demographic trends coupled with Social Security's pay-as-you-go financing method and with the retirement-age pattern which is promulgated by the Social Security program will lead to a much higher future cost of Social Security. (As indicated earlier, the tax rate will have to double within the lifetime of today's younger workers.) Because of the many misperceptions among the public about the Social Security program (for example, the inclination of the public to think that each person should receive benefits commensurate with his own tax payments even though that is not what the program is designed to accomplish), this higher cost will, in my opinion, probably be met not by higher direct payroll taxes, but rather by general revenue (which appears to be less painful and to be paid by someone else). General revenue for Social Security will from time to time be generated not by increased general taxes or by decreased government spending, but rather by deficit financing. Deficit financing leads, in my opinion, to higher inflation. Sustained inflation at high levels will lead to decreased viability for private savings (including the private pension system) which in turn will lead to less individual initiative and self-reliance, a weakened work ethic and lower productivity, which will lead to a decline in the national output of goods and services of this nation, which will lead to a decline in the U.S. role as a leading world power (so long as the world continues to measure power by economic strength,

and I do not really expect a change in this yardstick). This leads on and on to paths which are not clearly defined to me, but which do not appear to be very desirable. Perhaps you can define those paths down which we may be going.

So I would suggest that it is incumbent upon us as actuaries to take more seriously our job of making future projections of the consequences of decisions made today. We should spend less time worrying about whether the future inflation rate will be 4% or 5% or 7.35% and more time in evaluating the social and economic factors which will influence the future even more than interest rates, lapse and withdrawal rates, etc., about which we make finely honed assumptions.

When I left the Social Security Administration earlier this year, I had a rather unique opportunity to prepare a paper for the National Chamber Foundation to be presented at the Annual Meeting of the Chamber of Commerce. I call it the Mayday paper because it was published on May 1 (other people call it that for other reasons). Some of the ideas included in this paper are as follows:

- The total cost of our myriad of employee benefit systems, including the Social Security program, will become unsustainable, in my opinion, within our lifetimes.
- We must stop trying to figure out ways to pay for the programs we have. We must change the problems that we are trying to solve.
- We must do whatever is necessary to reverse the trend whereby the inactive population is growing more rapidly than the working population. I believe this requires some changes in the Social Security program which I suggest is partially responsible for defining the problem. For example, Social Security more or less sets the nation's retirement age. The mere existence of the Social Security program sets the standard for retirement, and thus creates an expectation among the public which then fosters a presumption of entitlement for retirement in a person's early to mid-sixties regardless of his health and his ability to continue as a productive and useful member of our society.

Although I do not agree with everything that our guest speaker said yesterday morning at the general session, I tend to agree with statements of this general type: Social Security, as presently constituted, is having an unintended, unexpected, unrealized, and, in some respects, an undesirable effect on our society. Social Security should meet the needs of society. It should not reshape the needs of society nor should it reshape society itself unless this purpose has been explicitly stated, understood, and agreed upon by the persons who are affected.

MR. ROBERT J. MYERS: In Mr. Robertson's comments on the ultimate costs of the Social Security program as being about 24% of taxable payroll as against a combined employer-employee tax rate of only 15.3% -- thus leaving a gap of almost 9% of payroll -- he should have made it clear that he was talking about OASDI and HI combined. Actually, the latter program contributes a very considerable amount to this gap because of the assumptions made as to ever-ex-

panding hospital costs (at a rate much larger than wages or general prices). In my view, something will be done to prevent this (although I cannot say just how), or else at some very long-distant future point hospital costs would, in theory, exceed the Gross National Product. I believe that consideration in this discussion should be limited to OASDI. Under such circumstances, the gap between income and outgo would be only about 4% of payroll, beginning in about 2025. Moreover, much if not all of this gap could be handled simply by only increasing the minimum retirement age for full benefits from 65 to 68, without the need for a complete discarding of the existing structure.

Mr. Robertson gloomily predicts the inevitability of a government subsidy to OASDI. I recognize that there are strong pressures for doing this under one guise or another. Perhaps because I am so strongly opposed to this procedure, which I believe is deceptive by hiding the true costs of the program from the American public, I believe that this will not come about in the OASDI program nor in the payroll-tax-supported HI program.

Mr. Robertson also mentioned the serious effect that high Social Security taxes might have on the economic situation of the country, particularly in relation to our competitive situation with other nations. Dr. Martin Feldstein made a similar comment in his address yesterday when he stated that our low rate of savings for capital needs was due to the burden of Social Security taxes, which prevented such savings. In answer to both, I would merely note that other countries which have higher rates of savings than the United States also have social security programs, generally ones with higher costs than ours.

MR. ROBERTSON: Some of the discussants have stated that my presentation was unduly pessimistic and that the future will be better than I have portrayed it to be.

The basis for my statements was that the present Social Security program is not changed, and the level of understanding among the public is not changed, and the nation's patterns of work and retirement are not changed. If we make appropriate changes in our entire social and economic environment (including the Social Security program), my dire predictions for the future will not materialize. That is precisely my point: We must look to the future as best we can, and make the adjustments which are necessary to provide us with a future we want. A good future will not result from bad choices and decisions made today. Good choices and decisions must be made today.

With regard to the experience of other countries with high cost social insurance and welfare programs: It is true the United States could pay the higher tax rates necessary to support the present Social Security program. The question is, will we? If we are willing to pay substantially higher taxes in the future, why are we so reluctant to raise taxes by very small amounts at the present time?

It is also important to note that what is good for one culture is not necessarily good for another culture. No one yet knows for sure that these high tax rates, and the cradle-to-grave social security programs which they support, are good in the long run even for Scandinavia or other countries. They definitely run counter to the American ideals of self-sufficiency, freedom of choice, incentive to produce and to save, etc.

The Soviet Union and many of the eastern European countries have extremely high effective tax rates (taking into account the very low wages paid the workers for their efforts). Accordingly, the governments of these countries are able to provide a wide variety of benefits for the population: pension and health insurance benefits, low cost public transportation, low cost housing, etc. But to have these (apparently) low cost benefits, the individual gives up much of his freedom of choice and is frequently told by the government where he can live, how large his housing can be, where he can work, how much property he can own, whether he can leave the country on a vacation, and for that matter whether he can even leave the country at all.

Any erosion of freedom of choice in the economic areas of life leads inevitably to an erosion of freedom of choice in all other areas of life.

It is true that my statement about high future tax rates includes projected costs under the Hospital Insurance program. The HI program is usually considered to be part of the Social Security program; the total tax rate paid by employees and employers includes the HI taxes; and the public will not be mollified by being told that a large part of future tax increases will be for the HI portion of Social Security and not for the OASDI portion.

In making projections of HI outlays, it was assumed that after the turn of the century medical care unit cost increases would be equal to average wage increases in covered employment, not an unduly pessimistic assumption. The same demographic changes in the population which will cause the OASDI program costs to accelerate rapidly after the turn of the century will also cause the HI program costs to increase rapidly.

MR. S. MICHAEL MCLAUGHLIN: I agree with nearly everything Mr. Haeworth Robertson has said, and I do not think his view is overly pessimistic. We are facing very real dangers; however, there are a number of other countries which have been in a similar position, and I hope it is possible to learn from them.

History of course does not repeat itself exactly so we need to interpret our observations intelligently. For example, if there is a higher rate of personal saving in some country which has a larger Social Insurance Program than the United States, we must recognize that there is not necessarily a cause-and-effect relationship there. The rate of saving depends on many factors including unpredictable human attitudes.

However, there are some patterns which occur so frequently that the lesson to be learned is very clear. One example is the relationship between expanding social programs, and the resulting inflation caused by the deficit spending used to finance these programs. Then, of course, the inflation itself creates the need for further increases in benefits. The alternative to deficit financing, if benefits are to continue to increase, is higher taxation.

But there is a further connection: As benefits approach the earnings level of a larger and larger part of the population, there is a reduced incentive to work. The resulting low productivity, with fewer working people as a proportion of the total population, is a cause of inflation on the domestic scene and, internationally, results in the weakening of the value of the currency relative to that of more productive countries. The unit of currency, both at home and abroad, represents a declining amount of value.

This problem has appeared in several foreign countries, including England and Jamaica, two cases with which I am familiar. I believe a similar thing is happening here in the U.S. I hope this is not a ramble through too much Basic Economics Theory, but we must try to learn from the experience of others.

Expanding social programs are not the only problem. There is deficit financing in other areas too, such as the purchase of foreign oil. Also, there is a trend of increasing regulation, which requires an increased amount of work to maintain a constant level of productivity.

We need a solution to these problems. Other countries have manipulated interest rates, restricted currency exchange, controlled wages and prices, and so on; with varying degrees of success; but few or none have relaxed government controls or reduced the growth of government.

Clearly we need Government to provide certain types of services, to regulate and to protect, but the expansion of these functions must be kept under control. We need to put Government on a balanced budget.

Proposition 13 is a good sign, but we need to budget the Federal Government too, so that they can no longer afford all the things they would like to do. I have enough confidence in the Free Enterprise System to believe that, freed of some of its present constraints, it will through natural forces return the economy to a vigorously productive condition.

MR. ANDERSON: It is true that many other industrialized, more mature countries have social insurance programs that cost more than what our program costs now, and more than what we project our program will cost in the future. But what works in another country in a different social and economic cultural environment would not necessarily work for us here.

MS. RAPPAPORT: The February, 1978 issue of Futurists magazine has an article on changing styles of work in the future and I find it a fascinating article. The typical life cycle that we think of today is called the linear life cycle. You go to school, you get a job and then you retire. Our retirement system and life insurance and disability programs are built around these 3 distinct phases. The cyclical life plan would have some periods of leisure interspersed with the periods of work.

Another thing the article talks about are different patterns of work. More part-time workers are due to younger people who are continuing their education, older people who might want to work less, and people who are sharing a large amount of household responsibilities at the same time they are working. Another alternate work form is job sharing. Two people do one job. Three people do two jobs. The article also talked about a four-day work week. There have also been some experiments where people have been offered more days of vacation or a shorter work week in exchange for pay reduction and that is particularly used for a situation where you might otherwise have to lay some people off. It is surprising that the experiment proved successful. The article also mentions flex time (variable working hours). Another way is to spread the work around a little differently, and perhaps this is a better solution.

All of these various patterns of work are ways to get more people working so that taxes will not be so high.

MR. ROBERT E. COLLINS: I wonder if anybody on the committee can tell me why the year, 1990, was chosen rather than perhaps the year, 2000.

MR. ANDERSON: I think 1990 is just about how far out I would want to go. Just look at those inflation rates we have! Almost two thirds of the respondents expect at least 6% or more inflation per year to the year 1990. Already we are beginning to see the strains in our society as various segments of our society try to exercise their "muscle" to keep from paying their share of the cost of inflation. I see some very rough times ahead in our society throughout the next decade. We as actuaries ought to be able to look at the impact of 15 or 20 years of 6% inflation and realize we are talking nonsense in projecting some of the things we do. This includes 20-year net cost comparisons unless we are going to put right on front of the policy that it is going to be less than a third in value by the 20th duration. So I chose 1990 because that is about as far as I can reasonably go.

Let me add a few more words about inflation. Inflation will continue as we desperately try to retain our affluent style of living. As the cost of energy goes up and the resources get more scarce -- and as more and more of the population in the world scrambles for those resources -- I see us having constant, heavy inflation. We are truly going to have to change our life styles in this nation and change our values, beliefs, and institutions. That is my view and I do not regard it as pessimistic. What will emerge ultimately will be better than what we have now.

I have one further personal observation about pessimism and optimism. The pessimistic futurists are not saying anything; they are out at Walden pond. The ones who believe that mankind will get through these trying periods are all out speaking and expressing opinions and trying to figure out how to find ways of inducing people to face reality. All I can say is "hang in there"; we will eventually get through these trying times.

MR. RICHARD S. FOSTER: Mr. Anderson's view that long range projections are a worthless undertaking startles me. He appears to base this conclusion on the fact that such projections will not be accurate. Of course not! Even Mr. Anderson's forecasts to 1990 are not likely to be accurate. The primary purpose of long range projections is not to predict the absolute path of future experience, but rather to indicate how a system or organization would operate in the future under various different economic and demographic conditions. In particular, many of our insurance and pension plans promise to pay benefits years in the future (50 years is typical, 100 years is not impossible). We can gain valuable insight into the future viability of the promises we make today by studying our plans under a variety of assumed economic and demographic trends. The alternative is to assume that "everything will work out or be so different that it will not matter."

The value of long range projections is clearly illustrated by two examples. The double-indexing of Social Security benefits for future retirees and the effect of the baby boom/bust cycle on Social Security expenditures were both identified primarily by long range projections.

MR. SAMUEL L. TUCKER: No discussion of Futurism should omit mention of an all-pervading aspect which threatens to eliminate any and all relevance of the economic and demographic influences currently under consideration. While it is so far outside our discipline that one hesitates to inject reference to the problem, yet its significance is so profound and even cataclysmic

that attention seems demanded. This world problem is the astronomical extent of military expenditures, the uncontrolled arms race, and particularly the nuclear arms race which promises holocaust for hundreds of millions.

Students of the problem, aware of the economic and psychological and nationalistic forces operating upon all concerned, realize that the probability of nuclear war involving the super powers is very high, practically a certainty in this century. Nuclear weapons are spreading inexorably to nations of large and small size, so that a head of state of paranoid mentality, or convinced that his situation is sufficiently desperate, can trigger the nuclear conflagration, just as in previous world wars, except that now all living creatures are hostage to these genocidal weapons.

An important gathering of representatives of many nations considered this enormous problem at the United Nations Special Session on Disarmament this year. One suspects that the majority of citizens of this and other countries were not even aware that the Special Session occurred. This is tragic.

The excellent paper discussed in this contemplation of future trends and conditions offers well-thought modifications of financial security systems that could counteract the social and economic changes foreseen. What answer is there to the very real and over-riding threat of extinction of civilization and of all the amenities of earth?

MR. ANDERSON: These comments are quite appropriate. I was appalled when I was reading some of the details of the Camp David meeting in that we are going to spend something like half a billion dollars for both the Israelis and the Arabs so that they can have the latest possible weapons and then both sides will be "equal". I can not understand why we continue with all this nonsense of nuclear proliferation when we can kill all mankind on earth many times over with our current weapons. What is the point of it? When are we ever going to face up to that reality? We should keep injecting these very appropriate comments into our discussions.

MR. GERALD A. FRYER: I have five brief comments:

- Family Structure & Divorce - Answering the question regarding the divorce rate trend is extremely difficult, because one needs to address the question of what one is divorcing oneself from - is it a legal contract; or is it an "extra legal arrangement"? If the latter, how well entrenched in terms of duration or financial arrangement does one need to be before the term, "divorce", can be used?
- Birth Rates - Mr. Ritterbush put forth the suggestion that if the original respondents in the questionnaire had realized that it would require a total fertility rate increase of 15% from current levels to reach a zero population growth, they would have increased their future birth rate estimates. I disagree! Individuals making decisions on family size are motivated by considerations relating to finances and their desired life style, not by demographic concepts.
- Mortality - I was surprised by the answers in the questionnaire for item C.b. regarding improvements in mortality due to changes in life style. My own feeling is that there will

be significant improvements due to life style adjustments. My company installed a small gymnasium and a running/calisthenics program a year ago. The response from the staff has been overwhelming. One only needs to observe the packed fitness classes at YMCA's and YMHA's, as well as the huge number of entrants for distance races, to realize that the population at large is beginning to look upon physical fitness as a desirable life style trait. Considerable improvement is still possible before we reach the fitness levels of the Scandinavians, for example. I believe this trend will favorably offset mortality of the middle-aged before the end of the century.

The favorable indication in this area lies in the reduction of stress. Only in the last decade has the work of Dr. Jelye and others obtained more recognition. Individuals now realize that a stressful life style is a high mortality risk life style. They realize that they have a chance of reversing such characteristics. But perhaps the most hopeful avenue in this area lies in an increasing knowledge of brain physiology and function. It does not appear impossible that man will soon be able to reach and modify those impulses in the brain which govern how we react to situations. This would increase the degree of placidity with which life is approached. (The dangers of such modification, however, must first be made apparent and dealt with by Society.)

- Retirement - The concept of temporary "retirement" and return to the work force is an attractive one, and one that certain groups such as university professors currently enjoy. It seems to me that actuaries could work on at least the financial mechanism for perhaps foregoing a part of one's post-retirement pension in exchange for leave-of-absense funding for periods of perhaps six months or longer.
- Inflation - The answers to the questionnaire reflect recent North American experience and are not surprising. The recent Canadian experience is sobering. We have not been below 6% inflation for some time, even with a lengthy period of wage and price controls. President Carter's targets set 5 3/4% as the new U.S. target for wages - what chance is there of going below 6% if officially sanctioned targets contemplate such a high rate?

MR. ANDERSON: The President's Council of Physical Fitness will tell you that if you start getting into shape and give up some of your poor habits like smoking and drinking, you mental attitude will improve. You will then find better spiritual health as a result of getting physically and mentally fit. I regard all of this as an extremely positive, wholesome, good thing that is happening in our society. With all the problems of the present medical system, I find this a "kernel of hope" for the future. Much of our discussion today may sound negative, but there is a solution somewhere if you keep striving to find it. You have been a wonderful audience and we thank you very much for your attention and the excellent feedback we received.