

# RECORD OF SOCIETY OF ACTUARIES 1977 VOL. 3 NO. 4

## FUTURISM

*Moderator: ROY R. ANDERSON. Panelists: GEORGE R. DINNEY,  
WILFRED A. KRAEGEL, ANNA M. RAPPAPORT*

The purpose of the concurrent session will be to discuss how best the Committee on Futurism can serve the charge which has been directed to it:

"This Committee's function is to acquaint actuaries with the activity which has become known as 'futurism' and to stimulate them to recognize it in their current decisions. In order to do this, the Committee will study changes which are of interest to actuaries speculating about their future effects and interpreting their interrelated significance to the profession and its varied activities."

MR. ROY R. ANDERSON: In preparation for this session, we sent out a letter and a bibliography which the members should have received three or four weeks ago. Included with the mailing was a membership application to the World Future Society. As of last Friday, the World Future Society had received over two hundred applications as the result of that mailing. It seems clear that many actuaries are interested in what futurism is all about.

I did not prepare any introductory remarks for this meeting because the letter that was sent out to the membership pretty much describes my thoughts on futurism. But for the purpose of emphasis, I would like to comment on what I have found to be the most significant feature of futurism. It is not the new techniques that have been developed for forecasting alternative futures although these should be of great interest to actuaries. Rather, the most important feature of futurism is that of perceiving the reality of the present. I have found that many people find it very difficult to face the realities of the present - especially when this involves thoughts that are new or foreign to their system or to their paradigm.

Let me offer a couple of observations on the books listed in the bibliography. I have found three to be the most helpful. First, "The Human Quality", by Aurelio Peccei (who is the President of The Club of Rome) beautifully expresses the world problematique and the challenge of mankind. Peccei offers some of his perceptions of how we might work ourselves out of the turmoil that the world finds itself in.

The second is "An Incomplete Guide to the Future" by Willis Harman. This book leads one to believe that fundamental changes are occurring in our civilization. Harman tells us that mankind is now in the middle of a period of transformation - one which may even involve an evolutionary change in man. That is a pretty wild concept, but it may be the nature of what is going on right now.

The third book is "The Structure of Scientific Revolutions" by Thomas Kuhn. This should be especially helpful to actuaries who are great systems engineers. They have constructed or helped construct many of our present systems and they

live within those systems. They cannot see that these systems are no longer working as they were intended. It is difficult for many to perceive that there are things happening which portend the destruction of or at least discontinuities in some of those systems. Kuhn's book is the classic on how the scientists - or experts - resist evidence that threatens the paradigm which they hold to be the truth.

MR. WILFRED A. KRAEGEL: Futurism is a many-faceted thing. It relates to every subject and object whether known or unknown to man. It relates to every second yet to come, whether the next instant or in the infinity of time. In other words, futurism relates to changes in all of the space over all of the time.

If futurism is so vast and boundless, then what possible relevance can it have to the practical world of actuaries, here and now? The answer is: a great deal of relevance, because the actuary's "here and now" is vitally concerned with happenings in the next several decades. In fact, life insurance actuaries have long been practicing futurists of sorts, in that they make forecasts of mortality, interest, expense and other factors, to be used as a basis for current decisions in levels of premiums, reserves, surplus and divided distribution. Other actuaries make similar forecasts to aid in current decisions.

Then, is the actuary a futurist as the term is understood today? Not really. Though at one time the actuarial profession was one of the most future-oriented, both the purview and the techniques of futurism have orbited past us. In my opinion, futurism is vitally significant to actuaries, and it is high time that we join in its orbit.

What is Futurism? Let us go back to the primary question -- what is futurism? Futurism may be thought of as the study of interactions and interdependencies over future time. The sum of myriad human decisions in the past, interacting with the other elements of the natural world, have created the human condition of today. Similarly, today's decisions will create our tomorrow. Futurism is simply an attempt to achieve a better understanding of the likely alternative consequences of today's alternative decisions. The increased understanding can then help us to reach decisions which provide the best blend of meeting today's needs and moving toward the preferred future.

In a very real sense, this is exactly what all of us think we already are doing normally, in both our professional and our private lives. Futurism can help us do this much more effectively, however, because it provides a useful discipline for the purpose.

As with other disciplines, futurism does this through a philosophy, a structure, a set of tools, and an accumulating body of knowledge. The difference between futurism and other disciplines is that futurism is newly emerging. Even the philosophers and practitioners of futurism are relative babes in this new world of thought. In fact, they do not even argue on what to call the study of futures. It was only in the February 1977 issue of "The Futurist", publication of the World Future Society (WFS), that the two words "futurism" and "futuristics" were proposed for the general and specific aspects, respectively, following a survey on the subject.

Interdependencies and Interactions Futurism is concerned not only with time, but also with interactions. Each action by each person or organization has

one or more effects on other persons or organizations because of their inter-dependencies. Most of these effects are trivial, but many are significant. It is the objective of futurism to seek out the likely and significant future consequences of current decisions and actions. In order to do that it is necessary to forecast what the effects will be on those who (and factors which) are influenced by the action, whether directly or indirectly. The direct effects are usually easy to recognize, but secondary and higher level effects are much more difficult.

And that brings us to the two faces of futurism: the micro-level and the macro-level, or the small picture and the big picture. The micro-level deals with the actions of persons and organizations as identified by their specific consequences over time, whether direct or indirect. The macro-level deals with the aggregate effect of the millions of actions in a city, or a nation, or the world. Both are extremely important, but while the former is understandable and manageable, the latter is perplexing and seemingly unresolvable.

It used to be that the sum of good decisions at the micro-level also produced good results at the macro-level. "What's good for General Motors" really was good for the U.S. -- or so it was perceived. Within the past decade, however, that reliable link between the micro- and macro-levels has been disrupted, and good micro-decisions seem to add up to serious macro-problems. This development has been called the world problematique, manifesting itself in uncontrolled population growth, food and energy shortages, depletion of resources, pollution, inflation and unemployment, more crime and less freedom. These developments have been succinctly outlined in a two-part article\* by Willis Harman in which he defines four seemingly unresolvable dilemmas which face our modern society. Harman also explores the likely directions necessary for resolving these dilemmas, but that is another story.

For the actuary, both the micro- and the macro-levels of futurism, have significance. The actuary can use the concepts and techniques of futurism to do a better job professionally at the micro-level. And the actuary can be one of many professionals helping to resolve the macro-problem, partly through its recognition while making day-to-day decisions and partly through coordinated efforts with other concerned segments of the economy and society.

Taking the Future into Account How does one take the future into account in making today's decisions? As one might expect, there is no magic formula to accomplish this. Each situation will continue to be unique, and the degree to which the future's perspective is injected into the process will vary by situation and by the competence of those dealing with it. Several questions which may serve as guidelines will give the flavor of the process, however,

1. What is likely to happen if current trends continue?
2. What alternative futures are possible?
3. What are the consequences, pro and con, of each alternative?
4. Which criteria are appropriate for evaluating alternative futures and their consequences? (including the objectives to be met)

\* "The Coming Transformation", the Futurist (WFS), February and April 1977.

5. Based on those criteria, which future is most desirable?
6. What must be done to achieve the desirable future?
7. What are the decisions for today which will provide the best blend for meeting today's requirements and moving toward a desirable future?

Note that we are not trying to make tomorrow's decisions today, but rather today's decisions with an eye on tomorrow.

Forecasting Methods A fundamental part of futurism is the technique of forecasting. The idea of futurism often conjures up in us visions of crystal balls and tea leaves on the one hand, or predictions of "gee-whiz" on the other. Technological advances have a vital role in futurism, and even the occult may have a measure of validity, but these are only a part of forecasting.

The work of actuaries has also for many years involved forecasts of future experience based primarily on extrapolations of the past. These also are only a part of the array of forecasting methods available for studying the future. Because of this long exposure to one important method of forecasting, however, actuaries may be particularly receptive to the broader perspective of forecasting and to the variety of methods available.

In the brief time available for this discussion of futurism, we can do little more than mention some of the other forecasting methods. A few informative and detailed books have been written about them, and any major library should have a number of them. For a quick overview, however, an excellent source is a recent two-part article\* by Joseph P. Martino, in which he describes two major categories of forecasting methods: exploratory and normative.

Exploratory methods are based on extrapolation; they start from the present situation and its preceding history, and attempt to project future developments. Examples include growth curves, trend curves, correlation methods, use of precursors, and more esoteric methods such as causal models, cross-impact matrices and scenarios. Actuaries have tended to use trend curves and correlation methods extensively, growth curves occasionally, and the others rarely, if ever.

Normative methods start with some desired or postulated future situation, and work backwards to derive feasible routes for the transition from the present to this desired future. Examples include morphological models, relevance trees and mission flow diagrams. I believe these also are used rarely by actuaries.

Other techniques which may supplement either exploratory or normative methods are the Delphi method and computer simulation. The latter technique is not uncommon in life insurance companies, and is very familiar to some actuaries. But the Delphi method is probably much less familiar.

This brief overview of forecasting methods may help you to gain a better understanding of that part of futurism with which the actuary has had some experience.

\* "Survey of Forecasting Methods", World Future Society (WFS) Bulletin, November-December 1976 and January-February 1977.

Specific Contributions of Futurism to the Actuarial Profession In the light of that background, what are some of the specific ways in which a clearer perspective toward the future can be of help to the actuarial profession? Several possibilities come to mind:

1. The future of aging and dying -- Premiums and reserves and dividends are calculated with the assumption of stable future morbidity and mortality patterns, (i.e., consistent with the recent past). Those patterns may change significantly in the next decade or more. Public awareness is increasing in the vital area of physical fitness, recognizing the importance of proper diet, regularity of eating, weight control, exercise, sleep, moderate use of alcohol, and termination of smoking. What can actuaries do to accelerate this awareness? Progress is being made in understanding the behavioral, environmental and medical parameters of both health and sickness. Potentially of greatest significance, extensive research is exploring the location and nature of the "aging clock" in living cells and organisms. Life spans could be increased moderately or dramatically during the duration of contracts now being issued. Conversely, life spans could also be diminished moderately or dramatically from overpopulation, food shortages, environmental pollution, new diseases, radiation or war. Actuaries have an important role, both in proper recognition of these potentialities and in efforts to strive for the better alternative futures.
2. The future of investments and interest rates -- Within the past five years interest rates have climbed higher than at any time in the preceding 150 years. How should this phenomenon be factored into actuarial assumptions? Are recent high rates short-term, long-term or permanent? The criteria for evaluation of investments are changing -- old industries declining, new industries burgeoning, greater recognition of social impact (both negative and positive). A few actuaries have responsibilities in the investment area, and most must deal with the interest rate phenomenon. We have tended to handle these developments using our traditional techniques. Are there better techniques available for the actuary?
3. The future of inflation -- In addition to its effect on interest rates, inflation increases costs and diminishes the value of insurance and pension products (though generally neither more nor less than other financial security approaches). Are actuaries taking into account the potential consequences of inflation? Can we do more to slow down inflation and avoid an unstable currency?
4. The future of personnel -- Dramatic changes have taken place recently in the degree of government involvement to change long-held patterns of discrimination against women and minorities. Many actuaries must deal with today's whirlwind of consequences. Have we reached a new level of stability, or must this trend still run its course? Participatory management has succeeded in making the working experience more meaningful for millions of people. Have we adapted? Is there still more to gain?

5. The future of equality -- We are still no further than the middle of an extremely important social issue; equality of opportunity vs. equality of results. Actuaries have the major role in the part of that issue which relates to insurance and pensions.
6. The future of the market for life insurance -- The market for life insurance has been remarkably stable over decades and generations. And life insurance products have been similarly stable. Changes in values, attitudes and opinions are taking place, however, which could change the demand for amounts and types of life insurance significantly. Long-term trends in plan selection, premium level and reserve interest rate, for example, may ultimately change the nature of the industry. How should the actuary recognize these trends in today's product design and pricing?

These are some of the more important issues which the actuary must address in order to give proper weight to future potentialities in today's decisions. There are others. Whether we like it or not, there are alternative futures, and our decisions made today play a major part in determining which particular future emerges.

Your reactions may vary from "I am already doing some of these things" to "I cannot possibly take the time to worry about most of those things. I believe most of us can do much better in this direction than we have in the past. Thinking in terms which give proper weight to the future will complicate our work, but it will also make it more challenging and more rewarding. For each of us to think of doing all of those things immediately is overwhelming and not practical. But for each of us to make a start in one or two of those areas, and to enlarge our thinking gradually to other areas, is entirely practical and should prove to be beneficial.

I have not said much about the so-called world macro-problem, because it may not be the easiest place to start for most of us. But as you become more future-oriented, read about and think about and talk about those crucial larger issues -- population, food, energy, pollution, resources, etc. You will gain a better understanding and appreciation of the world around you, and your professional and personal decisions will be made in a more complete context. From time to time you will certainly have an opportunity to vote for a better alternative future in one way or another, and you may be part of the legislative process or a community or industry group where you can have direct input on the decision.

MRS. ANNA M. RAPPAPORT: I am delighted to be participating on this panel this afternoon. I feel that my involvement with futurism has changed the way that I view actuarial problems, and my attitudes toward security in the financial systems with which I work. In my view, futurism includes several different elements:

1. Study of current developments to understand their possible impacts on the future;
2. Attempting to understand the range of possibilities for the future;
3. Learning to recognize signs of change early,

4. Trying to create the future which we want, which is very important.

I view futurism as central to the work of actuaries, and yet very foreign in approach. Actuaries deal with the operation, design, and financial soundness of security systems which must operate over long periods of time. Much of their work is based on studies of past experience, and application of that past experience in models of the financial systems. These systems will be operating in the world of the future, and not the past. It is therefore important that the actuary learn to be aware of the future, and of signs of change in the present.

I said that futurism is foreign to actuaries. Actuaries are accustomed to detailed and precise calculations; the futurists is used to early warning signals, to signs of change as they are peeping over the horizon, and to uncertainty about the future.

Futurism has changed my way of thinking as an actuary. To be more specific, I have learned

1. To be aware of external factors and how they are changing;
2. To be prepared for the unexpected and for uncertainty, so that systems should be designed to be adaptable to change;
3. To look for early signals that change has taken place; and
4. It is invalid to assume that past trends will always continue.

I will mention a couple of areas where I feel that the environment has changed, and will change more, and that such changes will affect security systems. We see reflection of the human rights movement in increased regulation and consumerism, the psychology of entitlement, and equal employment opportunity. We are likely to see more discussion of human rights in connection with ending or raising mandatory retirement ages, and suits asking for unisex tables to be used. Changed demographics have changed traditional marketplaces for security products. Further changes in demographics will impact more of these systems. The proportion of our population over age 65 will probably grow in the future.

Biological science technology will impact on security systems in many ways -- as it influences mortality rates and life spans, as it influences medical care costs, and as it may make more people available to work and wishing to do so to much higher ages. I do not believe that one can predict future changes, but one can study the possibilities and be aware of possible impacts, and be ready to adapt.

How can you become involved with futurism and why are we here? This panel is sponsored by the Committee on Futurism, and that Committee hopes to get input from you on what you want from it. There is a great deal of material that you can read, and the Committee recently sent out a reading list to the membership.

I personally believe that involvement with futurism to be meaningful requires more than just reading for most people. I think that they need a chance to participate in something, and to discuss and exchange ideas with others. Through such discussion ideas gradually build, and those individuals involved

in such discussions expand the way that they think. The Committee has a challenge, to serve as a resource within the Society which can assist you to build the ideas of futurism into your work as an actuary.

MR. GEORGE R. DINNEY: Roy started out by talking about the definitions, that we who call ourselves futurists, have of futurism. I would like to think of futurism as a kind of social disease. Some of us think we have got it but we cannot be sure because the condition is very difficult to diagnose. We know it is a societal condition but I also know, from my limited experience, it is not very contagious. So if most of you have come into this room at 2:30 without any taint or blemish you will probably leave at 4:30 without having contracted the condition. This should ease the minds of those who might have otherwise felt that at 4:30 you should rush out for a Wasserman test.

You have heard Roy talk about the credentials of Will and you know about the credentials of Anna. Regrettably, you have also heard what my credentials are so I stand before you, revealed as an impostor. I am flying, tonight, to Frankfurt, West Germany, and I feel standing before you, today, almost as if I were to approach the immigration counter in Frankfurt, tomorrow, with a homemade passport. However, the definition of futurism is broad enough to include homemade futurists such as I am, so I feel completely confident in addressing the charge of our Committee, which is to study changes, speculate about their effect and interpret them.

I think that all of us in this room would feel comfortable in being futurists if futurism was defined in the sense of a "tomorrow" world. I feel very comfortable with that definition because tomorrow never comes. I would be in the position of acknowledging that there is a future without ever having to come to grips with the future in realistic and practical terms.

One of the dangers in appearing on a panel and sending your outline notes to the chairman in advance is that he might subsume your arguments in his introduction. This is a little bit unfair because both Roy and I think alike in one important respect. Both of us feel the legitimate futurists are those who believe in the paradox that the future is the present. By this perspective, futurism is not an awful lot more than understanding that society is continually experiencing changes of earthquake force, whose shock waves inevitably and predictably will impact our lives. We are all familiar with these kinds of changes which are taking place in our society. There are all sorts of learned and dreary articles written by sociologists and economists and other near scientists that attest to this. I would suggest that if you want a good home course in futurism what you should do is read Playboy if you are a man, Cosmopolitan if you are a woman, because these contemporary periodicals speak in a straightforward way to the major changes that are taking place in our world. I believe that the kinds of changes reported in the popular press are of far greater importance to us as actuaries than those obvious changes that we can identify as innate to the insurance business.

But whether we are tomorrow people or legitimate futurists, it is important to understand that only if we concentrate on what is happening today will we be able to cope with today when it comes, as it must, a week from now or a decade from now. Another way to change your mind set from the indefinite future to the definite present is to consider the speed of change. Where is the future? Is it as far off as the work implies or is it near? Clearly,



the faster the rate of change the more contemporary the future is.

To depart from generalities let us take an illustration that graphically depicts these two elements, earth-shaking change and rapidity of change. To do this we can cite the example of computer technology. The President of INTEL, which is the largest manufacturer in the world of integrated electronic circuits, says that today you can store between 10,000 and 50,000 electronic circuits on a chip the size of your fingernail. He goes on to say that, very probably, within ten years and certainly within 15 years chip capacity will be increased to a million electronic circuits. What that will mean then is that you will be able to store all of the capacity in the largest computer available today under the crystal of your wristwatch. Again, using existing technology, by the year 2000 chip capacity will be increased to a billion electronic circuits. What this means is that you will be able to store, under your fingernail, all of the information that is now included in the 35 volume Encyclopedia Britannica. Which leads one to speculate that when that great come-and-get-it day does come, a person will become suddenly, and infinitely, wiser everytime he picks his nose.

In the light of these examples of forecasted changes in computer technology, a perspective on things present should cause us to inquire whether we should use even more highly advanced technology to do the same things. A true futurist would seriously question the appropriateness of using an even larger and even more powerful steam roller to crack a walnut. What a futurist would likely do is bring himself back to the perspective of his present condition. In other words he would redefine the problem rather than do as most of us do at the present which is leave the problem unchanged but analyze it in a much more complicated and detailed way so as to make the problem amenable to processing by the more advance technology.

If this sounds like an exaggeration I would like to share an experience that typifies the frame of mind I just spoke about. Recently, I had occasion to study our company's organizational structure. In the course of that study I had discussions with a large number of company personnel to find out if there was a correlation between the decision-making process in the company and corporate structure. In the course of that study I interviewed an officer who was identified with our computer operations. The question I was having trouble with was why the computer division spent most of its budget on ordinary insurance applications when a large share of our company's profit and growth came from our group insurance operations. The answer I got was revealing. I was told that computer technicians, and I am tempted to include actuaries as well, tend to think of themselves as chess masters. They only deign to solve those problems that are worthy of them. So they look around for the more complicated and convoluted problems. These problems abound in the ordinary insurance operations and not in group operations. So we had developed a rather funny rationale for cost benefit justification. Benefit was measured in terms of mental exercise for the technicians rather than some broader definition of benefit for the corporation as a whole.

Many think that futurists are simple minded. From my personal knowledge of my fellow panelists I can assert that they are simple minded. But the definition of simple mindedness is such that one clear sign of a futurist is that he sees the obvious things, the simple things. He looks right through the problem. A simple minded approach to the problem that we face as actuaries would force us to face up to fundamental changes in our society that have in fact impacted our operations but which we have disregarded.

It reminds me of the story of the man who was told by his doctor that he had three months to live. He did not want to believe it, so he went to a succession of doctors until he finally found someone who would give him nine months to live. If the patient had been a futurist, he might have admitted to himself that he had a problem that he could not ignore. We come close to the truth when we think of futurists as realists, rather than as prophets or visionaries.

MR. ROBERT F. LINK: In Willis Harman's book, he describes the four terrible dilemmas that society faces. He then seems to be saying that society is going to move in the direction of a greater experiencing of various kinds of psychic phenomena. My question to the panel is; is there some way you can make that observation or other observations of Willis Harman relevant to what we ought to be doing now in the spirit of futurism?

MR. ANDERSON: Let me tell you of some help I got from Willis when I went out to visit him after he had talked at a Trend Analysis Program meeting as a guest speaker. I had come to an understanding of the magnitude of the problems that our civilization faces - and to believe that our nation would have to adopt a less affluent and less wasteful standard of living. This kind of message that must be given is not what most people like to hear - e.g., that we will no longer be able to enjoy the same degree of growth and profits that have made our machinery run in this country for several centuries. So I asked Willis how you can make people face up to problems of this order of magnitude.

Willis Harman told me that there are three kinds of problems. The first is the one that is just as it seems to be on the surface (e.g., you have broken your arm and there is a bone sticking out). The second kind is such that you can see the problem on the surface, but the real source of the problem is something that is underneath the surface (e.g., a boil that is not a skin disease but is indicative of an underlying infection). The third kind of problem is the problem that is like a thread inter-woven in fabric. It is so much a part of it that you cannot see it. Then, if you begin to see it, you are afraid to pick at it because the fabric may fall apart. Many of the problems we face today are of the third kind. We have to recognize that many people cannot see them because they are inter-woven in the fabric of our system - and many will refuse to see them if they fear that by picking at them, the system itself will be threatened.

Let me offer you a specific example of this third type of problem that confronts us in our own business of Health insurance. It has to do with the problem of controlling health care costs. One of the most meaningful things that I have heard at this conference was said yesterday by Dr. Mayer when he observed that there was no way, under the present system of financing, of controlling the doctors both with respect to what they prescribe and how much they pay themselves. This system provides for reimbursement after the service has been rendered. Now that is a systemic flaw of our system of medical insurance that was started with Blue Cross back in the 30's. The Health insurance companies followed it - and medicare and medicaid were also patterned on it. Our systems of health insurance are now like an engine that is out of control. We keep trying to control medical care costs by putting bigger brakes on the wheels - but the whole system is just heating up and it is not going to last much longer in its present structure.

I believe that we are not going to get out of this mess we are in with our

present health care system - unless we begin to face realities. For example, we must begin by recognizing that we are not financing a health care system; it is a sickness system. As long as we continue to delude ourselves by thinking of our system of medicine as a system that deals with health we will fail to understand the nature of the problem that confronts us. We need to go back to basics - beginning with an understanding of what health is all about. Society must structure the system of medicine starting with the doctors doing something completely different from what they are doing today. I also believe the public is beginning to sense all of this. They are beginning to find their own solutions as to how to achieve health - and we in the health insurance business are doing very little about it. This whole area of self-care and holistic medicine that is developing is one that we seem not to want to know exists. Let me repeat that the major feature of futurism is to be able to perceive the realities of the present.

MR. KRAEGEL: I have another comment on what Harman's thinking means to us. He sees man coming out of this period of transition as a more transcended being and not just a material being. There are two guiding ethics. The first is an ecological ethic which relates to man as a part of the whole world around him, the interactions between man and other beings, and between man and the physical aspects of the world. The other is the self-realization ethic which asserts that the proper end of all human experience is the further development of the self and the human species. I think that it is difficult to go from the kind of theoretical approach that somebody like Willis Harman used to specific personal actions. But, there is in all of our activities a philosophy and a policy, whether it is our institution's or our own personal policy, governing how we go about things. Your personal actions are determined by your policy and your institution's policies and by the philosophies that underly them. So, he is suggesting we need a different philosophy. We must think about that philosophy and gradually incorporate it into our being. Then, I think, we will do more of the things that put people into their proper perspective.

MR. JAMES C. HICKMAN: If I understand part of the message that has been given, it is that our social, our economic and our physical environments are made up of sub-systems. The relationship between and among them we incompletely understand, and when we look at each of the three we have only begun to appreciate how they interrelate. But we are told that we have a responsibility to understand them and to adopt systems that are adaptable and that can roll with the inevitable punches that the future will bring. Now given that as a proposition, I would like to pose a certain problem that I see in what was articulated by President Jackson this morning. He was talking about pressures for a specialization and fragmentation of actuarial education. It seems to me that the pressure for fragmentation and specialization in actuarial education may well conflict with the responsibility that the panel pins upon us to be aware of the interrelationships between all of the insurance sub-systems. Secondly, the President talked about the desirability of public recognition and the definition of an area in which actuaries alone were competent to perform certain services. If the institutions of society will change as they have in the past, is it not enormously risky to tie one's profession to any set of institutions that will probably change within the professional lifetime of most of us in the room. Therefore, the question to the panel is; Do you see, as I do, deep conflict between the responsibilities that you have pinned on us and the drive towards specialization and fragmentation of actuarial education? If so, what are the resolutions of this conflict? Secondly, is there a conflict between the futurist's view and that of

tying the profession to particular institutions and particular services to the institutions that may exist today?

MRS. RAPPAPORT: Jim, I think those are very provocative questions and you in fact raise two fundamental dilemmas. I would agree very strongly that there is a real danger in specialization and fragmentation. There is also the fact that if we are to be adequately qualified to practice in any particular specialized area the amount that we have to know seems to be increasing so fast that we have a real problem. All of us can not know everything. In the paper that I co-authored with Peter Plumley we looked at some of these issues, and at the possibility that maybe there would be more options and more opportunities in other application areas for actuaries. Actuarial science might become more generalized as a total body of knowledge. There could be more choice as to what individual actuaries are required to know, and more diversity in what actuaries as a group know. It is also possible for us to broaden our knowledge in a different way. I think that it might be possible for individual actuaries to have their knowledge more specialized to one product line vs. several product lines but at the same time take a broader viewpoint in some of the subjects that we learn. Also as actuaries we have to choose assumptions. It is essential that we remember that we are living in a changing and uncertain world. I agree with Jim Hickman that there is a conflict but I do not think that it is one that cannot be resolved. I would love to see many more generalists. I think that the world has thrust upon us this need to specialize and to know the exact body of regulation which applies to each product line. If you look at the essence of the systems that we are dealing with, much of the regulation is really trivia, but if you try to practice in the real world you must know all the trivia or you cannot practice. I agree very strongly that public recognition in a narrowly defined area is very risky and I hope that actuaries will in fact practice in additional areas and that the scope of actuarial science will be expanded.

On the other side of the coin: if we do not define ourselves as being qualified in at least some narrow areas other people will. The way of the world today seems to be to build fences and create narrow qualifications. We must make sure that we have public recognition in those areas where we practice today and at the same time not stop looking for new areas and not be open to new areas of endeavor for actuaries.

MR. EDWARD A. LEW: I want to assure the Committee and the panel that I am extremely sympathetic with their objectives but I have a very uneasy feeling that some of the comments we have heard today approach very dangerously to the edge of what one might call pretentious platitudes. I think that you are trying to develop what I would call a better art of conjecture. I think there is confusion generated by the extremely rapid technological changes, but you are closing your eyes to the fact that biological changes are extremely slow. They take centuries not years, and social changes, despite all of the gymnastics that we have seen, tend to fluctuate or at least change much more slowly despite the surface appearances. I wish to propose therefore that if we are to be true to our heritage as actuaries, we must keep our feet on the ground and be careful with generalizations such as those which some of the futurist groups have used.

MR. DINNEY: It is surely pretentious to lecture one's peers about the obvious. Nevertheless it is irresistible to say that it is not as important to conjecture about the future as it is to do something about the present realities of our profession. As an example, everyone talks about the need

for product redefinition to accommodate real social needs, but nobody ever does anything about it.

MR. KRAEGEL: During my comments, I made reference to the two levels of decision making and consequences. One I called the micro-level and one the macro-level. The macro-level, in particular, may sound pretentious at this point. However, the micro-level is a part of futurism which is very significant to us as experts in the actuarial field. It provides us with more powerful forecasting tools than are now at our disposal. I do not know at this point what we should do at the macro-level. I do not think that we, as a Society, have matured enough in our thinking about futurism to do much. But, I think it is very important for each of us as professionals and as members of the Society to think of the micro-level and what it means to us as actuaries and knowledgeable people so that we will have a better understanding of the overall consequences of what we do.

MR. ARDIAN C. GILL: I think being a futurist is probably something like going through a complicated schedule and itinerary without having a watch to tell you what time it is. Ed Lew's remarks related to schedule changing, and Ed mentioned that biological things tend to change slowly over time. A lot of other things, such as oil prices, tend to change slowly and then, suddenly, we have the oil embargo, the rise of the OPEC nations and an enormous discontinuity. We knew about the oil reserves, and we had some parameters for judging future oil prices, but a discontinuity entered. In our own profession we have a similar discontinuity, in fact two of them, arising at the moment. One is longevity, which changes very slowly. But Congress at least in one current instance is acting very rapidly. We were used to the normal retirement age of 65, but suddenly there is an actuarial discontinuity introduced and practically overnight it may become age 70. Male and female mortality differentials have existed for centuries but they have changed slowly. If you look at the life expectancy of males and females at age 65 around the turn of the century you will see that female mortality was superior but only by a modest amount, actually less than one year in total life expectancy. Now the differential is in the order of seven years.

MR. KRAEGEL: One quick addition to that; the discontinuity of longevity has one very significant potential. There are people who think we are on the verge of finding the aging clock in human beings and other living things. I am not sure there is one. Our aging may ultimately be triggered by cosmic rays or another such natural element over which we have absolutely no control. But it is quite possible that we could have a significant effect on longevity in the relatively near future. By relatively near, I mean within the next few decades. This would be significant to our life insurance and annuity contracts.

MR. RAPLH J. BRASKETT: Can futurism reverse the revolution of rising expectations and rising entitlements that some of us heard this morning? What can futurism do to show actuaries the imminent collapse of some of the income systems which they work on, or rely on, to provide income replacement for the part of the system they work on?

MRS. RAPPAPORT: Ralph, I do not think futurism can do anything to reverse any of these trends. I think we as individuals can. If enough of us are interested and enough of us try hard we can bring about a change. Futurism can play a role in helping us to become aware of these issues early enough and in helping us to become aware of the fact that we do have a role to play

in creating the future we want. It is up to us to learn what the issues are and try to find solutions with as broad a perspective as possible. One of the problems is learning to see how an issue relates to different and interlocking social systems. If you only define problems in terms of one system, you can try to solve it and in the process create more problems than you solved. Futurism helps us to learn to look for the problems early and interests us in trying to analyze them in terms of their implications on all of the systems that they affect or certainly on as many as possible.

MR. ANDERSON: I would like to offer my own perception of futurism. It is more a state of mind than an attitude and approach to studying problems. I do not believe that all of the members of our Society should become the same type of futurists. In fact, we here on the panel differ in the relative importance that we place on the macro and micro issue. So, I think our job on the Committee is to expose the membership to the reading, the new concepts and the ideas that are emerging in this new field of futurism.

Now, Ralph touched on our systems of compensation. The discussion in Concurrent Session J this morning was on the possible and probable futures relating to retirement income security. My perspective is that the question is not even stated adequately because it refers only to "retirement". What we face in the future is not only a re-examination of Social Security, but a whole new perception of what work is, what retirement is, what worthwhile activity is, and how all of the systems take care of those who are not in the process of producing or serving. As part of this problem we have the growing systems of compensation that have been proliferating somewhat independently. Workers Comp, unemployment insurance, food stamps, welfare, Social Security, disability income and no fault auto have all been growing as if it did not matter that they are impacting and infringing upon each other. I do not believe these systems are really going to last much longer in their present shape. At some point in time we must re-structure the whole system of compensation to re-establish some basis of taking care of the people who are not working any more. I believe that we, as actuaries, have a great responsibility for just cataloging the systems of compensation in order to achieve some kind of equity when that happens.

MR. DINNEY: There are answers to the tide of rising expectations. However, they may not be good answers from a futurist's standpoint. We heard Wil talk about exploratory techniques that should make it possible for us to compare available resources and rising expectations throughout a given future. Whereas this may not do very much to diminish the current expectations it could produce a surprise-free situation in that people should not be surprised if their rising expectations are not met on that great come-and-get-it day. I may have misunderstood the other question you raised, but I thought you were talking about what the futurists do about things that are threatening to replace the system that we operate under.

MR. WILLIAM C. CUTLIP: One thing I would like to see the Committee keep in mind is the micro concept of speaking to the everyday problems of the actuary. We need not only the perception of the Committee and an education at the macro-level on significant sociological changes, but also a method of developing techniques that can be understood by the practicing actuary so that he or she can develop an awareness and use it.

MRS. RAPPAPORT: I think that your comment is very important and would like to raise some questions for you to ask yourself about the work you are doing.

I think these questions might convince you that you really want to have a futurist outlook and attitude in the way you do your work. What are the real characteristics of your marketplace? What are customers really like? Are their needs the same as you think they are? Have you really tried to find out? What are the likely characteristics of your marketplace five and ten years from now? What are some of the demographic trends and how do these relate to your current and future marketplace? How does currently available technology affect what you should be doing now in the way of making decisions as to how you are going to run your business? How do people's values today affect whether insurance is going to be a public enterprise, a private enterprise, or a combination? That is certainly going to have a big impact on your business. What effect do people's attitudes and values today have on your personnel policy? Now of course when you ask these questions you will find that in many cases you made changes and you adapted them without explicitly recognizing social change. In other cases you may have recognized the change. Nevertheless, I believe that the exercise would be very interesting and it might make you view your decisions differently.

MRS. ELSBETH T. ERBE: If all actuaries became acquainted with the techniques of futurism and tend to view problems from the perspective of a futurist, will there be any dangers? Have those of you on the panel encountered dangers in futuristic type thinking? For example, in concentrating on the solution to a long term problem, is it possible that one might become calloused to people's problems which will go away five or ten years from now and which are not part of a long range problem and a long range solution?

MR. ANDERSON: My experience has been that futurists tend to be humanists who are very much concerned with the plight of mankind. I do not think they are likely to think of stomping on the people in the near term to get the benefit of the long.

You ask if there are any dangers. I would say yes. Futuristic type organizations tend to self-destruct because most of the organizations to which they are appended do not really want to hear the message. I have found time and time again that the leading futurist of an organization would be set apart from the main stream of his company once management realized the enormity of the message he was giving them. They preferred not to face it. All of this is related to the message in Kuhn's book on paradigms - and how the leaders of systems resist change.

MR. KRAEGEL: I think that each actuary can benefit by learning some techniques that are becoming available and are being used more and more effectively to do the same kinds of things relatively that we have been doing. ARCH for example, is not receiving enough attention. There are dangers whenever you are tackling something new. You can over-compensate by going too far in one direction, but hopefully the net result will be a better balance than before.

MRS. RAPPAPORT: I would just like to add one comment. Much of what we are talking about is sharpening our perceptions of the present.

MR. DENIS W. LORING: I think the problem of the mandatory retirement age is an excellent example of something that could give futurism trouble. Actuaries have been studying demography for a long time and have looked at the changing population and its possible future effects on pension plans.

Suddenly the system rumbles, politicians perceive it, and we now have mandatory retirement at age 70 instead of age 65. The question is; Do futurists worry about bridging the gap between the information gatherers and the decision makers?

MR. ANDERSON: The TAP program picked up the trend of changing perceptions of retirement ages several years ago, but we never really put it into focus. You put your finger on a real problem. How do the futurists get their perceptions to management so that they will make use of them? I guess that is the second of two charges of our Committee. The TAP program, incidentally, is unique in the business world. It is the only program formed by a business to give the perspective of the long range future.

MR. DINNEY: Roy, I would like to respond to two previous questioners. The kind of discontinuity that has been identified comes under the heading of the two basic techniques that Will spoke about earlier. One technique is called normative. It is ends-directed. The other technique is exploratory and it is not ends-directed. Governments, by and large, tend to think of ends, namely what they want to do rather than how to get there. Consequently, there will be discontinuities such as have been identified because social objectives sometimes are allowed to overrule economic means. Change in the mandatory retirement age is just a backlash to a failed social objective, the age 65 retirement age.

MRS. RAPPAPORT: Roy has mentioned the TAP program. For those of you who are not familiar with TAP, as liaison representative of the Society of Actuaries to the American Council of Research Program, I would like to just mention that these reports are available to all of you. The Trend Analysis Reports are published approximately three times a year by the American Council of Life Insurance which is now headquartered in Washington. For people who are not Council members, I believe there is a nominal fee of about \$5.00 for TAP reports which basically covers the publishers cost and postage cost, and I personally think that all of us think that those reports are worthwhile reading for every actuary.

MR. SAMUEL B. ECKLER: I think you are urging us to be generalists rather than specialists. But each of us is affiliated with some kind of sub-system not with the whole system. In our day-to-day work our affiliations, which can be called vested interests, in a sub-system which pays our salaries, may collide with the kind of perceptions that come when we view these sub-systems as generalists.

MR. KRAEFEL: I think that each of us has probably at one time or another run into conflicts in our own organization. There is always a question of how much time you spend on the specific, what is earning the bread and butter and how much time you spend thinking about the future. I believe that what we are asking for is balance.

MR. DINNEY: In reply to Sam Eckler's comments, neither futurism or any kind of ism changes the dimension of conflict we face in the exercise of our normal work. As an example, Sam Eckler has been an illustrious member of various actuarial bodies. In serving your profession from time to time, there will be some very fundamental conflicts between what you are asked to espouse and what you probably would have done as a private actuary in your own practice or company.



MRS. RAPPAPORT: I would like to take a little different perspective in response to Sam's question because I think I do a lot of the same things that actuaries do every day and that my futurist perspective causes me to ask more questions. I might do exactly the same thing as another actuary or I might somewhere along the way stop and say wait a minute, do not forget about some current societal pattern. I find that often I have different perspectives, and that my perspectives influence my work.

MR. ROBERT D. SHAPIRO: You say that we are becoming too specialized, and that we are losing perspective by not being generalists. When thinking about a problem are we to get away from the scientific method to perceive a larger picture, and then come back to scientific methods to apply a perception of that broader picture to our everyday problems?

MR. DINNEY: I agree with your summary. We are talking about the blend of the right and the left hemispheres of the brain, the scientific and the artistic. Perhaps in our society we have had too much of the scientific, and the eastern societies and cultures have been too philosophical, and we need a blend of the two. Futurism tries to strike the happy medium.

MR. KRAEGEL: In my opinion the scientific method served us well in the early stages of scientific development when we did not have to worry much about the consequences of the sciences. It seemed that about everything we did had substantially good consequences. But I think we are getting more and more to the point where we can do almost anything we can conceive. Therefore, we must be much more selective in what we do. So, I think we must enlarge the scientific method to include consequences.

MR. LARRY R. PETERSON: I wish to supplement the bibliography found in the September, 1977 pamphlet from the Committee on Futurism. There is a major piece of material, some old techniques for forecasting the future, which I find rewarding, and I highly recommend to the futurist -- particularly one who is open to all types of thought.

An initial reading list would include books of Daniel, Matthew, Thessalonians and Revelation. They are books dealing with predictions concerning people, nations, times and events. The material may be elusive and enigmatic to beginning students. Once mastered, however, the messages become quite explicit and meaningful.

Why are these books not widely accepted today?

It is not because the predictions have been inaccurate. Literally hundreds of predictions in these books have been perfectly fulfilled. The record of history, archeology and science has proven this true.

For example, the book of Daniel, written during the time of the Babylonian empire, has a detailed description of the great empires of the world, Babylon, Medo-Persia, Greece and Rome. Since the time of this writing the world has seen these empires come and go. One empire, a ten nation confederacy, a revival of the old Roman empire, is yet to emerge.

It is not because these books are irrelevant. In fact, there are several predictions yet unfilled. In our lifetime, we are seeing the fulfillment of a number of these prophecies. A good example of this is the emergence of Israel as a nation. This was recognized by serious students as being

predicted by the suggested reading sources and appeared in their writings as early as 500 years ago. There are many, many more examples.

It should be pointed out that unlike some of the fulfilled predictions in which exact time periods were specified (and perfectly fulfilled) we cannot tell exactly when these latter predictions will be fulfilled. We know the "what" of the prediction but not the "when". However, it now seems possible that based on given signs, many will be fulfilled before the close of this century.

Space does not permit me to discuss this subject in detail, but I will be happy to attempt a response to any of your questions.

I bring these books to your attention because they can be and are easily overlooked, even ignored. References which have so much to do with today's world deserve careful analysis. Only then can you accept or reject their conclusions.