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## WORLD FUTURE SOCIETY'S SYMPOSIUM—REVIEW

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This session, sponsored by the Futurism Section, reviews a sample of the presentations at the World Future Society's 1984 Assembly, WorldView '84.

MR. JOHN K. BOOTH: What was WorldView '84? The World Future Society's WorldView '84 was a five-day convocation of several thousand persons whose one common interest is thinking about and discussing the future. The emphasis of the conference was to discuss possible solutions to the world's problems rather than just the problems themselves. Over 600 speakers from many fields of endeavor participated in the various panels, speeches, workshops and question and answer sessions. It was a very open and democratic forum for the expression of different ideas, as it seemed that almost anyone who had an interesting view on the future could be on the program. Faced with such a smorgasbord of topics and viewpoints on the future, it was up to each participant to separate the preposterous from the plausible and to sample bits of the future from different vantage points.

The spectrum of ideas covered a wide range. Some were close to the kinds of things that actuaries do while others were far removed from our approach to the future. My remarks today will be my impressions of WorldView '84. If, as is stated in the motto of the Society of Actuaries, "The work of science is to substitute facts for appearances and demonstrations for impressions", you may wonder why I should be relating impressions from WorldView '84. Perhaps this points to the differences in traditional approaches to predicting the future that are used by the actuary and the futurist. The actuary digs deeply within a given subject area to gather many facts which are assembled into demonstrations of expected and probable future courses of events. The futurist may cover a much broader horizon and often envisions whole scenarios of future activity based on the slimmest threads of available evidence. If a futurist has an impression that there will be a future historical discontinuity that will interrupt past trend lines, how can this be demonstrated?

Even so, the work of the actuary and the futurist are not that far apart. Each to some degree uses the techniques of the other. Whenever an actuary introduces an element of "judgment" into future projections because the available facts do not seem to complete the picture, that actuary is behaving to some degree as a futurist. Futurists and futurism can be a great help to actuaries by serving as a distant early warning of possible future events which should be investigated more thoroughly because of their potential impact upon the financial security systems for which the actuary is responsible. With this thought in mind, Wilfred Kraegel will offer his views on how futurism and WorldView '84 can help the actuary in predicting and planning for the future.

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MR. WILFRED A. KRAEGEL: Thank you, John. You are right, I do have a somewhat different perspective. You mentioned the difficulty of separating the preposterous from the plausible. I think that is one of the intriguing aspects of the future. There are many things that we regard as preposterous today, but I can say with certainty that some of them will become plausible tomorrow. The difficulty is that we do not know which ones. This requires keeping an open mind, so that as the preposterous starts to show signs of becoming plausible, we do not hold on to the preposterous notion so long that we are injured by it.

John gave a few comments on the question of how actuaries relate to futurists. The nature of that relationship is important, because if we do not understand it, we may overlook significant new directions for actuarial thought.

Actuaries have made forecasts about the future traditionally on an exploratory basis, particularly through extrapolative techniques. We have looked to the past as the primary determinant of the future. Many futurists tend to use the normative basis for making forecasts, that is, to recognize that we create our futures to a large degree. This may appear to be a distinction between actuaries and futurists, but it should not be. Actuaries are increasingly using the normative approach to supplement the extrapolative, while futurists are recognizing that the future begins with the present and is influenced by the past. Both actuaries and futurists are most effective when they factor into the decision process the full range of the time dimension -- past, present and future.

May I comment also on John Ruskin's maxim regarding appearances, and demonstrations versus impressions. I am one who disagrees with that as an appropriate motto for the Society of Actuaries. A very great part of the world functions on impressions, and if actuaries completely stick to "facts" as we are able to determine them, we are apt to be left behind as everyone else is moving along with their impressions. People are acting on those impressions and creating new facts which may not be a part of the actuary's assumptions. John Booth suggests that the actuary assembles many facts into demonstrations of probable future events, while the futurist often envisions whole scenarios of future activities based on the slimmest threads of available evidence. I believe that difference is exaggerated, but even if it were true, the slimmest thread may prove to be stronger than the mass of facts, for two reasons. First, the decisions of related parties (e.g., competition, regulations, taxes) may make some of the facts irrelevant overnight, and second, the thread may be based on a new way of thinking about an issue which is outside the understanding of the one who assembled the facts. Even the preposterous may become plausible. This does not mean the actuary should abandon rigorous analysis and cling to the slimmest threads. Rather, it means the actuary should become skilled in synthesis, giving proper weight to facts and appearances, to demonstrations and impressions, all in the full spectrum of time. That is a challenge worthy of the actuary!

Webster's Unabridged Third International Dictionary does not define futurism in the sense used by the World Future Society. However, Webster's defines a similar new word, "futurolology", as: "A study that deals with future possibilities based on current trends". That is a half-way respectable definition, but I do not think it is adequate. I would say that futurism is the study of future alternatives and their consequences, including new ways of perceiving reality, and the role of current decisions in achieving the preferred alternatives. No doubt that definition is inadequate too, because futurism is an emerging phenomenon. However, that definition does recognize some of the key

elements -- the alternatives, the choices, the openmindedness, the interconnectedness -- clearly concepts with which many actuaries can identify.

Actuaries have long had a great concern about the future, perhaps longer than almost any other modern profession. My thesis is that this relationship, this area of similarity between the two, is going to continue and will increase. And so I ask the question, are actuaries really different from futurists, or are we actually futurists ourselves? I would propose that actuaries are futurists by the very nature of our work. Actuaries are futurists in the context of financial security systems, just as some professionals in other systems are futurists in their contexts. Futurists usually are generalists, with an area of specialty. So too are actuaries. But I would propose further that actuaries have not generally kept pace with the increasing scope of futuristic thinking, nor with the burgeoning set of techniques that are available to us as futurists.

Let me illustrate. We have a shrinking world, particularly because our economic and technological development have made us extremely interdependent and have spilled over into our political and sociological areas of life. As a result, some of the issues that we could safely ignore in the past, such as male-female roles, rights of minorities, environment, religious differences, conservation, etc., can no longer be viewed as abstractions which are not worthy of our time. We do not have that luxury any more, and we must pay attention to them. Fortunately, we are aided greatly in our understanding of these issues through the ACLI Trend Analysis Program, of which Sharon Meluso is director.

Of course, there is a limit to how much our attention can encompass. We cannot be expert in all things, but ignoring them is also to our peril. So, what to do? Happily, we can make use of the burgeoning set of techniques available. I would suggest four categories that are particularly significant and that we may increasingly utilize as actuaries -- microelectronics, telecommunications, participative personnel practices, and expanded planning processes. I will let you imagine how all of these fit together and how to develop them, because that is another topic. In sum, at one time actuaries were at the cutting edge of future studies, of being able to take the future into account in today's decision processes. I think actuaries have lost that cutting edge. Many things have happened, both in the scope of the issues to be included and in the techniques which we can use, and we have been slow in assimilating them into actuarial thought, perspective and discipline. In losing that cutting edge, we have lost some of our capability to be of service to our organizations, to our Society and to ourselves. We can regain that cutting edge by reemphasizing the importance of a more comprehensive understanding of present and future in actuarial deliberations.

MR. BOOTH: Will, your remark about some ideas being preposterous today and plausible tomorrow reminds me of remarks made within a committee of the American Council of Life Insurance that was working on a new flexible-interest rate valuation law a few years ago. When the subject of interest rates rising to fifteen percent was brought up, most committee members thought that was a preposterous idea!

What sort of people attended WorldView '84 either as participants or panelists and how do they view the future? Politically, they tend to reflect more liberal and progressive views since many futurists believe that political action is necessary to change the course of human events to avert future crises. Consequently, many participants were not oriented toward the bottom

line profits of business but were more concerned with other goals. However, it behooves anyone in business who is planning for the future to pay attention to these concerns since they will have to be dealt with in a democratic society.

If one message seemed to dominate the global view of the conference, it was the concept of the earth as a limiting boundary on most human activity. This requires us to adjust our activities to be more in harmony with nature by recognizing that the earth's resources are limited but that with proper planning many resources can be made reusable. Since most of the pressures of human population growth in the next several decades will be in the third world countries, their fate and that of their resources will become of increasing importance to the industrialized nations.

Another concept that pervaded the conference was transformationalism. This is the idea that as strains continue to mount on either natural or human systems, eventually the systems respond by means of a radically new adjustment or sharp discontinuity with what has happened in the past. This transforms them so that they can continue to function in a new and different future environment. Human beings are perhaps unique in being able to consciously participate in the evolutionary process of transforming their systems and the directions in which they will move after discontinuity and transformation. With this as prologue, I will ask Grace Dillingham for her impressions of WorldView '84.

MS. GRACE V. DILLINGHAM: The role of the actuary, according to one definition, is to evaluate the current financial impact of future contingent events. One role of the futurist is to help people choose the futures they prefer. The two roles share at least a preliminary step -- recognizing what futures are possible. Many of the sessions at the World Future Society Assembly this summer looked directly at what is possible: it's happening already; it's a reasonable extrapolation of present trends; it could happen, if... . And they presented numerous "ifs". Other sessions were concerned with the process of envisioning those possible futures. They talked about improved perception, ways to teach thinking, and using the imagination to open new logic circuits. They had a lot to say about the difference between left-brain and right-brain thinking. They pointed out that there are many types of thinking, and that not all are appropriate at all times. People are important, they agreed.

As actuaries, we are trained to think logically, verbally, mathematically -- and to be proud of this left-brain dominance. Art and intuition and other right-brain types of thinking may not be closed books to us, but they're not exactly encouraged.

None of the sessions I attended wasted any time trying to persuade the artistic and intuitive to think logically. Whether they considered it unnecessary or impossible, I would not care to say. It may be a function of the sessions I attended. In any event, there did seem to be considerable interest in persuading the logical thinkers to use their intuition.

Some of this could be passed off as self-serving; there were a number of panels where the speakers were primarily promoting their own training courses. Even from these, however, it was possible to derive some helpful pointers.

I would like to use my time with you to share what I learned about the process of envisioning possible futures. What follows is my own interpretation of what I heard at the panels on "The Communications Era Task Force"; "Choosing a Future You Prefer"; "Technology, Technologist, and Technocracy"; "Improved

Perception as the Basis for a New World View"; "Future Time as a Personal Concept"; "The Brain-Mind Systems and Learning"; and "The Literary Image of the Future". I have supplemented my notes on David Loye's presentation at the panel on "Future Time as a Personal Concept" with material from his book The Sphinx and the Rainbow. It is a fascinating book, although at times it made me think of the white queen believing six impossible things before breakfast. It is one of many books that were described by their authors at "Meet the Author" sessions in the book shop each noon.

The overall message of the panel on "Choosing a Future You Prefer" was that many futures are possible; much can be done to influence what will really happen; it is critical to clarify and to risk projecting what we would really like to have happen to fulfill the desires and needs of others and of ourselves. An open mind is essential.

Problems can be turned into opportunities, was the message of "The Communications Era Task Force". There are many problems which cannot be solved but can be by-passed. We can bring about desirable changes when we see new directions and act to achieve them.

Learn to value intuition, said a speaker on "Technology, Technologist, and Technocracy: Coping with the Human System in Modern Technology". Think in terms of "ready, fire, aim" rather than "ready, aim, fire". That brought a big gasp from the audience there. Learn to recognize and communicate what you feel, then follow with logical and analytical thought about what you want.

Our visions of the future start with our perceptions of the past and the present. These perceptions, of course, are by no means unmediated. They depend very much on our personal histories, education and environment, on our earliest experiences and, perhaps, even on what we had for lunch today. We don't necessarily recognize these influences. As one of the speakers said, at the panel on "Improved Perception as a Basis for a New World View", "Culture affects perceptions as hypnotic suggestion does."

Another speaker stated that clear perception is basic to the solution of every crisis, conflict or problem. (You cannot solve a problem if you do not know what it is.) She described perception as developing from instinct through intellect and intuition to illumination. While most humans are in the intellect stage, there are enough intuitive individuals to solve our problems if they are allowed to do so. Illumination, if I understood her correctly, is the goal, as yet unrealized, of seeing reality as it is, not darkly through the glass of intuition, the still more clouded glass of intellect, or the blindness of instinct.

The concept of time, basic to our self-concept and our understanding of the world around us, was discussed at the panel on "Future Time as a Personal Concept". Here, intuition was described as the unknown which enables us to leap across time. Recent brain research has shown that there are three kinds of time and three kinds of intuition related to them, not just the left/right brain dichotomy. There is left-brain-oriented serial time, in which information is processed step by step; there is right-brain-oriented spatial time, in which information is devoured whole in what might be called parallel processing; and there is "timeless time," to which it is difficult to assign a brain location but which might be analogous to a hologram which can be cut smaller and smaller and still retain the whole image.

The first type of intuition, cognitive inference, is primarily a left-brain, linear activity. It may be a matter of thinking faster, rather than differently. We call it intuitive rather than logical, because we are not aware of all the clues for rational inference.

The second type of intuition is not arrived at by reason in the left-brain sense of the word. It is a right-brain, gestalt process that detects gaps, missing pieces, or hidden relationships within the patterned pressures of the whole array of perceptual information. It closes gaps and rounds off rough edges of perceived wholes. It allows us to reach sound conclusions on the basis of inadequate data.

The third type of intuition is the precognitive function. There seems to be a capacity to make use of a kind of sensing for which no sense organs have been found through a means that has defied scientific understanding. It could be seen as coming about through a regression of the brain to the kind of "whole mind" functioning that seems to exist before the split into right- and left-brain functioning that comes at a certain development level with organisms and that occurred within the evolution of the human race. It could also be seen in mystical or metaphysical terms as operating through some advancement to a transcendent higher consciousness.

In thinking about the future, we can potentially make use of all three kinds of intuition monitoring all three kinds of time. But at present most of us are aware only of serial time, only dimly apprehend spatial time, and find it impossible to believe in timeless time. Consequently, we make minimal use of our powers.

According to a speaker on the panel on "Brain-Mind Systems and Learning: Ways to Teach Thinking", logic is the second stage of thinking, perception being the necessary first stage. Apparently, this speaker sees logic as a verification or correction of an intuitively derived picture of reality. He spoke of thinking as a skill which can be taught. As another speaker on the same panel emphasized, psychologists do know things about thinking and have achieved spectacular results. I would suggest that one thing they have not achieved is a consistent vocabulary for use in popularizations such as the WFS assembly. I think that many of the speakers I heard were talking about the same processes and phenomena, and were basically in agreement, even when the same words, at least as I scribbled them down, were used in quite different ways. Naturally, I cannot be sure of this. I am left with appearances and impressions rather than facts and demonstrations. However, it seems to be worth investigating, worth trusting our intuition, at least once in a while.

The final panel on which I wish to report, "The Literary Image of the Future", featured a well-known science-fiction author and television producer. He spoke of using imagination to tap new ways of using the brain and to open new logic circuits, and of using extraterrestrials to look at ourselves and our universe as if from outside. His extremely intelligent, extremely logical, unemotional Vulcan serves to point out the importance of the characteristics he does not possess -- or at least does not admit to -- as well as those he does.

In closing, let me tell you about a remark in quite a different forum, a task force considering implications of the new income tax law for life insurance companies in the United States. We had been delving into turn-of-the-century law books, trying to determine prevailing state assumed interest rates prior to adoption of the Standard Valuation Law. "Researching the past is kind of

challenging," someone said. "Researching the future is kind of challenging too," said the chairman.

MS. SHARON C. MELUSO: Now that we have had the three actuaries on our panel speak about some of the left-brain/right-brain material, I will try and bring us back to reality and talk about economics. First, I want to thank the panelists for defining what a futurist does. I always have a very difficult time with this, and I think people in general do. This is evidenced by many of the calls I receive each week at the Council. People call up and the conversation goes like this: "Hello, do you conduct futures research?" and I say "Yes." And then they ask me questions on pork belly and soy bean investments. And I say "No, you need the Economics Department." I decided at one point that maybe I should not call myself a futurist, maybe I should call myself a forecaster. And then I got calls from people wanting to know if it was going to rain tomorrow, so I'm back to the drawingboard on exactly what I should call myself at the Council.

I want to talk about the several sessions at the World Future Society which looked at the economic system. I will give you the titles of those sessions and some of the main speakers and then a general synthesis of those sessions. The first presentation was one given by Dr. Jay Forrester, from the Systems Dynamic Model at the Massachusetts Institute of Technology (MIT). He gave a presentation entitled "Economic Conditions Ahead". There was also a panel "Two Views of the Nature of Economies". One view was presented by Hazel Henderson, who is a known futurist out of Florida, the second by Bob Hamrin, who was previously with the government and is now coordinator of the Project on Industrial Policy in the Environment. The third presentation on the economy which I went to was entitled "Revitalizing Industries and Economies". The presenters there were Professor Russell Ackoff of the Wharton School of the University of Pennsylvania and Professor Robert Ayres of Carnegie-Mellon University. The fourth presentation on economics in the United States looked at employment megatrends. This was a panel of various people from the Bureau of Labor Statistics, U.S. Commerce Department and the U.S. Trade Representative. The last presentation was entitled, "Systems Thinking and the New Management Style". It was an excellent presentation and if you have a chance, you might want to order a copy of that on tape from the World Future Society. The presenters were Elsa Porter, former Assistant Secretary, U.S. Department of Commerce, under the Carter Administration, and Peter Senge, also of MIT Systems Dynamic Project.

All five of these presentations had some information on the economy as it stands today. I would like to review with you some facts and figures that I found very interesting. First, there was quite a bit of conversation on the federal deficit. The U.S. federal deficit is now five times larger than the foreign debt. The foreign debt is doubling every two years, and by about 1990, it is projected that it will double every year. That is, of course, if current trends continue. By 1985, the U.S. will be the largest debtor nation. This reverses a 70-year trend where the United States was a net capital exporter. We were lending more money, sending more overseas than we were bringing in. I might add, however, that in the 19th century, the U.S. was a debtor nation. It seems that we are returning to this status.

Some other interesting facts: For every one percent increase in the interest rate, there is roughly a \$10 billion increase in the federal deficit. So, if interest rates go up, we're in trouble. Also, for a one percent increase in unemployment, there is roughly a \$30 billion increase in the federal deficit. Another trend that economists follow with great interest is the expropriation

of U.S. assets by foreign corporations. Foreign corporations are buying U.S. companies and real estate. This is on the rise. We have a decreasing number of people involved in hands-on production, which most of the economists at the World Future Society found to be a big problem. Another trend that we are just starting to see in farm prices, and in real estate in certain parts of California, is a deflation of real estate prices. Another topic that received quite a bit of attention was the international debt crisis, and I will talk about that a little more later. Another point of interest is that the United States is now consuming more goods and services than it is producing. This is sort of a good news, bad news story.

The good news is that with increased imports, consumers in America have greater variety of choice in what they purchase. It also means that there is downward inflationary pressure because of the competition in prices due to imports. Because of high imports, there is quite a bit of pressure on American industry. Although this is a short-term problem, in the long run it most likely will mean efficiency for our industries.

The bad news, though -- most economists say there are two sides to every story -- is that there has been an increase in calls for protectionist measures, to try to protect us against imports. Another problem is that because of all the foreign capital that is coming into the United States, in investments, that capital is not used in developing the developing countries.

In all the presentations of the World Future Society on economics, the bottom line was that we are mortgaging the future. And what are some of the driving forces behind this? How did we get to this state? This is not a general consensus, but I've lifted some of the material that the presentations cited. First, the U.S. moved off the gold standard, and we went to the floating exchange rates. Second, there were the oil shocks of the early 1970's. Third, large international loans were made to less developed countries (LDCs). Our fourth driving force is competition from newly industrialized countries, the Taiwans and Koreas of the world who are competing with our industries. And a fifth area is employment megatrends. These are trends both within the country and outside the country, which are having a serious impact upon business. One is the baby boom generation, the generation of people who are now entering middle-management slots or trying to. There are about five people for every middle-management slot now in the baby boom generation. This is creating quite a bit of competition for jobs. Another employment megatrend is population growth in developing countries, and right now the median age in most developing countries is around 20 years old. This means that most people in those countries are in the prime ages for employment, and they are unable to find jobs. A third area of employment megatrends is the shift in employment due to robots and automation. This is occurring not only in developed countries but in developing countries as well. And the last area of employment megatrends that was discussed at the conference was worker values. This includes things such as demands for different types of benefits and changes in unions.

The first person I want to talk about is Jay Forrester and his model for explaining our economic situation. He has been working at MIT on the Systems Dynamic Model which is an economic forecasting model unlike most others. The model includes microeconomic decisions of business leaders. He includes in his model decisions about inventory orders and production. Also included in the model are public policy decisions which affect business. And lastly, the model includes information on three different cycles. The first is the business cycle, three to seven years, and the second, the Kuznets cycle which



looks at backlog orders and fulfillment of capital plants orders. That is about a 15 to 25 year cycle. And then there is the so-called Kondratieff wave or the long wave lasting between 45 and 60 years. A lot of economists do not accept this, but it is an interesting theory. The basic idea behind the Kondratieff wave is that roughly every 45 to 60 years industries need to retool, or the industry becomes obsolete. In other words, there is an over supply in that industry. If retooling does not occur, the industry falls in on itself. So, Dr. Forrester states, we are now at the peak of a Kondratieff wave, which means that we are approaching the point where everything is going to be on the downswing until we hit bottom again in this 50-year cycle.

What are some of the characteristics of the peak of this wave? Well, first there is the severity of the business cycle. It means that each three to seven years the dip between the peak and trough gets more and more severe; we have been experiencing this since the 70's when the oil shocks occurred, through the last recession in the early 80's. Next there is an overexpansion or surplus in certain sectors, and we see this today in the auto industry. At a conference that I attended last week, the Trend Analysis Program (TAP) Conference, it was suggested that the financial services industry was over expanded. Another characteristic of the peak of this curve is decreasing productivity and we see this in quite a few developed countries. Another characteristic is reducing return on investment. For each dollar put in an investment, you get less back. Hence, there is increasing debt and lastly increasing real interest rates. We have been picking up some of this information in the economy right now.

What happens once you are at the peak? There are two things that can happen, according to Dr. Forrester. First, we can have a deflationary spiral or, second, there can be hyperinflation. Dr. Forrester is very pessimistic in his analysis. He says we are riding a fine line between status quo and disaster, but if we have to go the route of disaster, he prefers the inflationary spiral. At some point we will get back on track again.

Dr. Forrester did have some solutions for us. He says that in the future, it will be a balancing act. What we must look toward is not high technology. High technology will not solve the problem; it is only about five percent of gross national product (GNP) now. He also said that the service economy is not going to help out. He had a very interesting comment: "The service sector is a halfway house between manufacturing and employment". Dr. Forrester feels, however, that we should increase production. And to do this, we need to increase the number of people in hands-on production. He said to the conference attendees, "Most of you out there are in middle management, and we need to get rid of middle management, we need to put you back into production. So start looking for jobs". He also said we need to reduce federal expenditures, increase savings, consume less, and accept the fact that many lesser developed countries just are not going to pay their debts.

There were some other presenters at the conference who had differing views. Hazel Henderson stated that in looking at the economy we need to take into account more than just economic factors. It is not enough to look at GNP; we need to look at things beyond traditional economic characteristics. For example, according to Ms. Henderson, we need to conduct technology assessments of what different economic policies may require. We also need to develop social and/or job impact statements, so that when we venture upon a different economic policy, either in a company or as a government, we know what some of the likely impacts may be. Another idea suggested is to develop international economic impact statements. Much like environmental impact statements, these

statements would look at the international economy as a whole and how the company's or government policy will affect the international economic situation. Dr. Russell Ackoff, who was another presenter at the conference, stated that we need to change the meaning of wealth. He said that we also should allow private sector corporations to compete for public sector services, to try to achieve more efficiency in the government, and, lastly, he supported debureaucratizing government and business.

Peter Senge and Elsa Brown spent most of their time talking about what corporations can do at the company level. Mr. Senge and Ms. Brown have been studying corporations that they feel will be successful in the future. They have come up with eight different characteristics which need to be incorporated in the companies. First, companies in the future will need to have corporate vision. What is the company doing and where is it headed? Second, leaders in the company will need to be corporate designers. They will need to have the ability to design their companies so they can function in the future. Third, companies in the future, in order to compete in the international economic situation, will need to encourage risk taking and entrepreneurial activities. Fourth, there needs to be increased trust among employees -- trust in the ability to say exactly what they feel without fear of retribution on the job because this will encourage ideas. Fifth, we need more employee camaraderie and Peter Senge called this love in the company. We need to have more corporate love in the company, where people feel a familial tie with those that they work with. Sixth, they urge that the decision-making process be decentralized and that most decisions be carried out on a local basis in individual departments, rather than in top management. Seventh, along with this, they encourage small and intimate business units. And lastly, companies in the future will be encouraged to have reward systems that share risk and share opportunity.

It was interesting to see how much of this was reiterated by different speakers at our TAP conference last week. We had Dr. James O'Toole of University of Southern California (USC). Dr. Russell Ackoff of the Wharton School was at our conference and also Dr. Richard Robnick of USC. And the three of them picked up on many of these themes. The same themes are coming through again and again in the reading that I do and the different conferences I attend. And the bottom line is, as far as business and government go, we need to examine the future more in depth. We need to take a look at long-term consequences of business decisions. We need to do this via futures research -- scanning, scenario building, forecasting and computer modeling.

MR. BOOTH: Dr. Forrester's Systems Dynamic Model of the national economy was certainly one of the more interesting presentations at WorldView '84. Rather than extrapolating from macro-economic trends, the model combines micro-economic decisions by individual businesses with related delays in the economy to simulate macro-economic results.

Whether the system is programmed to run in a stable no-growth state or with varying growth rates, three principle cycles of activity emerge. While the intermediate cycle of 15 to 25 years is related to the backlog and fulfillment of orders for capital plant, the 45 to 60 year "long wave" cycle is related to capital equipment used to produce capital equipment.

Some danger signs to watch for that may indicate we are at the end of a "long wave" expansion are possible default or expropriation related to foreign debt, runaway compounding of interest on the U.S. national debt, problems in

meeting the home mortgage debt and public dissatisfaction with the services sector of the economy which is in great danger.

Although the majority of economists in the United States do not feel the "long wave" economic cycle exists, there is a tradition among European economists for considering this hypothesis. As an indicator of possible futures, it may be worth examining.

Sharon, you said that at the Trend Analysis Program Conference which you attended last week, it was suggested that the financial services sector of the economy was overextended. Would you elaborate on that, please?

MS. MELUSO: Well, the person who made the comment was one of our speakers, and he felt that there are just too many insurance companies and too many banks and that sooner or later they are going to collapse in on themselves. The competition will weed out the small companies and those that are inefficient, those who do not have the ability for future vision.

MR. BOOTH: Perhaps this is related to the comments Dr. Forrester was making about too few people being in production. Everyone is familiar with the Baldwin-United situation where a great deal of the inflation in the value of that holding company structure was built on "hot air". Does Dr. Forrester's "long wave" indicate that an entire economy, a national economy or even a world economy, can be pumped up with "hot air" until someone realizes the truth and the whole system contracts?

MR. KIRAN DESAI: Baldwin's collapse was not because of hot air, as much as because of lack of expertise. They went into financial services not knowing what they were getting into, and did not recognize the difference between making pianos and selling annuities. I hope you are not going to build the future economy on lack of expertise. If they are going to weed out financial services companies which are inefficient because they do not know what they are doing, that is a good thing, because a lot of trust is necessary in the economy for financial service companies. There are 1,800 insurance companies in the United States. The question I have for Sharon is, did the speaker indicate what is the optimum number of companies. Is it three, is it five, is it 17,000, is it 1,500?

MS. MELUSO: He said there would be about 300 financial service companies. I do not know how many life insurance companies that would include.

MR. DESAI: Do you know how he arrived at that number?

MS. MELUSO: I haven't the slightest idea. Jay Forrester commented that we need to move between ten and twenty percent of the American population back into hands-on production. That would reduce the number of people available to work in financial services.

MR. JOHN O. MONTGOMERY: In Japan they have only about ten or twelve major companies and there the competition is severely restricted. It is very difficult for an American company to go into business in Japan. A number of companies have tried it and had difficult times. There is a completely internal system operating which is purely nationalistic. So, when they are reducing the number of companies, I hope it does not get down to ten or twelve. Furthermore, as we are finding in the Baldwin-United case, with holding company operations and leveraged buyouts, you get so-called pirates,

raiding companies of their assets and replacing them by assets that are not of the best quality. How do you plan for something like this as a futurist?

MR. BARRY WATSON: A few observations; first about the hot air point. I used to play a game, reading Business Week, which quite often would have a little article on some company which was being exceptionally creative and was bound to be the greatest thing since sliced bread. Well, if you continued to read, there was a half-life of about a year, and then you would read that the company had gone belly up because they were being so "creative" that they just completely failed. I think that there is a danger when you talk about intuition and all these wonderful things about looking at the future that you may well be getting into areas which are entirely inappropriate. The comment about bringing more people into hands-on manufacturing may be valid, but at the same time, this can actually represent merely an effort to duplicate in the future what we have been doing over the past 100 years and have just recently given up. To my mind, that is not futurism, that is "pastism". One very small point, I think it is kind of amusing that the left side of the mind is the logical one, the right side the intuitive. You might think that the rightwingers and leftwingers might get very disturbed over this, until you remember that it is the left side of the mind that controls the right side of the body. So I guess you can wave the right wing with the left side of the mind.

MR. KRAEGEL: Could I comment on the intuitive part, please? There was an article in Fortune within the past year or two which related to that particular point. It is important to recognize that we must walk a tightrope here. A completely left-brain approach misses some important things, and a completely right-brain approach also misses some important things. Most people tend to be heavily concentrated on one side or the other. Actuaries tend to be heavily concentrated on the left side, the analytical perspective. This Fortune article suggested that many of the most successful chief executives in the United States pursued their work, made their decisions, with a surprising amount of intuitive effort on their parts. And that can be a very logical way to do it, because our brain knows much more than we know we know. We cannot recall all the things that impinge on a particular topic and bring them into orderly process. Rather, we can get all the input we can and then have the total brain work on this. While you are sleeping, while you are working on something else, and then while you are shaving, or in a conference or whatever, these things come out that you did not know you knew. There is still very little understanding of the brain, but it is one intriguing area that is being researched and that holds great promise for our future ability to interact among human beings.

MR. MONTGOMERY: As a good practical example of what you were just talking about, when we were designing the Dynamic Valuation and Nonforfeiture Laws, the index that was suggested was the interest yields on public utilities. It seemed to me at the time that with all the atomic or nuclear power plants that were going up that that was probably the last thing they should use, and so we advised the National Association of Insurance Commissioners (C4) Life, Accident and Health Insurance Technical Subcommittee that the designers get a new index, which thank God they did!

You also mentioned several indicators, all of which are taking place right now. Surplus in some regions was one, increase in the service sector of the economy, declining productivity in many areas. How long ago did Dr. Forrester come up with this theory? Did he predict all of what's happening now?

MS. MELUSO: He's been working on this project for some 20 years. Part of the dissertation of one of his graduate research assistants was to test this model, and she went back 600 years to the 1300's and tested it, and it follows very closely. Still, many economists take issue with Jay Forrester.

MR. ANDREW GALENDA: I wonder about the relationship between futurist planning for the economy and the place of the free market system. For example, someone said that we should have 20 or more percent of the people involved in production activity. What would they produce, and who would buy it? And if it were beneficial, why would they not be doing it already?

MS. MELUSO: Maybe we ought to ask Jay Forrester that, but I think futurists are not all one group. Some are of the persuasion that we need to plan to the point of directing X percent into this type of business production and X percent into that, but that isn't true of all futurists.

MR. KRAEGEL: There is not a homogeneous futurist group in the sense of political orientation. There are conservatives who are futuristic and there are liberals who are futuristic. There are Republicans and Democrats who are futuristic. The one thing they share in common is an open mind. I think that is the hallmark of a futurist -- to recognize that there are different realities, different perspectives, depending upon the particular circumstances in which individuals and institutions find themselves. As a matter of fact, my recent studies of capitalist and Marxist thought suggest to me that the two viewpoints see the future quite differently. The Marxist approach is essentially deterministic. Marx saw one ultimate future, and contemporary Marxists do not deviate far from his unique scenario. Capitalists do not see ultimately just one future. They see a variety of futures. So, by and large, if you have to make a political determination about futurists, generally speaking they would be far more on the free enterprise side than on the socialistic side.

MR. BRIAN LAU: If you make linear extrapolations, they usually are smooth. Nonlinear effects tend to give you the discontinuities. In Dr. Forrester's model, are the equations linear or nonlinear?

MS. MELUSO: Nonlinear.

MR. DESAI: I would like to add a word of caution to Wil's observation on many CEO's coming to decision making on an intuitive basis. Often the intuitive process is a euphemism for lack of homework.

MR. KRAEGEL: A good supplement to my point. Thank you.

MR. FRANCISCO BAYO: There is the other side of the coin. Many managers refuse to make a decision when there is no decision to be made because all the facts are in. A decision really is a decision when you have to make up your mind, either black or white, one or the other and not all the facts are in.

MR. BOOTH: On a more global scale, Ervin Laszlo, Director of the United Nations Institute for Training and Research in Rome talked about "1990-2020: The Crucial Epoch". He predicted a giant system transformation of the world order around the end of this century or early in the next one. This view is based on a belief that human society and technology as we know them today are not sustainable by the natural ecosystem of which we are a part. Even if there is no world war there is serious danger of a breakdown of society. Several factors point to this. Two-thirds of the countries are losing self-

sufficiency in food production and are reducing food exports. Even in the U.S., interest on farm debt now exceeds farm income and irrigation, farm machinery purchases and fertilization fell off last year. One-third of the world's people are unemployed. There will be a 2.7 billion increase in the world population over the next 30 years with 90 percent of it in poor countries with few jobs.

More and more of the population of the third world countries will be gathered together into the third world supercities of the 21st century. These supercities with populations of 20 to 30 million each will dwarf the largest cities in today's industrialized nations. Will these giant cities become so large as to be unmanageable and doomed to collapse with massive starvation and human misery? Or will they through some transformation process find a way to cope with their problems and survive? If they do remain viable cities, most of the world's largest urban centers will be in third-world countries. For those Canadian and United States companies that are interested in marketing overseas, these supercities could open up a tremendous new market for insurance and financial services products.

However, third world countries today are having difficulty even paying service charges on their debts. Will third world countries join together to form a consortium to repudiate their debts? If so, what would this do to the financial systems of the industrialized nations? What would happen to such essentials as roads, schools, and sanitation? A breakdown of systems could lead to massive starvation and unemployment in these countries. Numerous dictators might come to power and control and try to use the remnants of the military machinery. Such a scenario would destabilize the present global technical industrial system and would create an opportunity to build a new more decentralized world society.

On a more positive note, the world population annual growth rate leveled off at about 1.7 percent in the mid-1970's (at 2.4 percent for the less developed countries). However, due to the large number of young persons of child-bearing years in the less developed countries, the population of the world will keep on growing until well into the 21st century.

Dr. Zheng Guang-lin of the Institute of Scientific and Technical Information on China in the People's Republic of China presented his views of the preliminary results from the "China 2000 Study". China has been particularly successful in slowing its annual population growth rate from 2.6 percent in 1970 to 1.8 percent in 1980. The study contains ten research reports with suggestions for action on population, economic development problems, transportation, communications, consumption and conservation of water and food supplies, and surveys of mineral resources. One objective is to quadruple the gross national product by 2000. The study suggests a holistic approach be taken to solving problems. His remarks seem to reflect a trend in China away from the strict Marxist approach to a more pragmatic approach to solving problems. We might pause again to think what the future would be if the Chinese are successful and eventually achieve a level of technical and industrial development comparable to that of Japan. If both the new supercities and the Chinese are successful, we may find that in the 21st century we will live in relatively small countries surrounded by the giants of Asia and the third world.

Genetic engineering holds promise for solving some of the problems arising from human consumption and human waste, particularly in the case of third world countries. Applications of this new technology are to improve existing products, increase the availability of rare products or create new products in

the areas of pharmaceuticals, agriculture, animal health, plant biology and environmental waste control. However, along with potential solutions to old problems, genetic engineering brings new concerns relating to applications to change the genetic structure of humans, uncontrolled release of genetically engineered life forms into the environment, and new forms of biological warfare. These last concerns may well give pause for speculation on the future by those whose principal business depends on human mortality and morbidity.

Another very interesting session run by William Halal of George Washington University and Irving Leveson of the Hudson Institute focused on revolutionary changes in the United States economy and U.S. corporations. Free-floating international exchange rates and the oil price shocks have led to basic structural changes. There is greater reliance on market forces to fight inflation. Nearly 40 percent of capital investment is in high-technology industries with short pay-backs. A new wave of communications and computer technology is having profound effects on the ways in which we do business not the least of which is the growth of electronic marketing networks which is as important as the growth of franchises once was. Most new employment has been in the services sector of the economy while employment in the goods sector has remained flat. Joint ventures are on the rise where customers and competitors may work together as partners.

Fundamental changes are also taking place in the management and objectives of U.S. corporations where humanistic and business values are coming together. Increasingly, the corporation is being recognized as a political coalition of interest groups and it is expected to create social wealth in addition to financial wealth. Corporations that fail to recognize this may likely face public relations, union, consumer or government relations problems.

The difficulties in managing large and diverse corporations have led to decentralization and to the creation of small free enterprise business ventures within large institutions. Here new ideas can be more easily tried and their success or failure is more readily apparent. Corporate hierarchies of authority are giving way to organic networks which give more opportunity for worker participation and collaboration in solving problems. In their relations with the outside world, corporations are becoming more customer-driven and need to emphasize servicing rather than selling. The life insurance industry might ask whether servicing or selling will become more important in competing for the financial services dollar. In the future, the secret of corporate success may be to unify all interest groups, employees, stockholders, and consumers into a single organization.

A session on the future of the financial services industry was moderated by Wayne Boucher of ICS, Inc., and included as panelists Danny Wall, the majority staff director of the U.S. Congress Committee on Banking, Housing and Urban Affairs, Jerome Svigals who works for International Business Machines in planning their marketing to the financial services industry, and Roy Green, executive vice president of the U.S. League of Savings Institutions. Spurring the revolution in the financial services industry is the fact that high interest rates have transformed consumers into value oriented purchasers of financial services. By 1986, the last vestiges of controlled interest rates on customer accounts will be removed for savings and loan associations. Future services in the form of more financial information will be offered. This could include personal budgets with an analysis of insurance needs and provision for automatic deductions from the customer's account to meet those needs. The delivery of financial services will shift away from brick and

mortar facilities toward more telecommunications networks and automatic teller machines.

In spite of legal barriers to change, market pressures driven by consumer needs will continue to alter the provision of financial services. Examples of these are the creation of non-bank banks (i.e. banks that are not subject to certain banking restrictions because they have either loans or deposits but not both), the entry of lawyers into mortgage lending in New Zealand when mortgage lenders were unduly restricted, regional compacts among banks to avoid restrictions on interstate banking, and insurance-company/bank arrangements for the sale of insurance on bank premises.

One problem all financial institutions will face, as consumers become more value oriented and new technology makes it easier to move deposits, is the interest rate risk. Another problem in the evolution of financial services is the social need to preserve small firms in their local environment where they can provide services and loans to the local economy. Will increased interest rate competition pull deposits into the more volatile national and international financial markets and raise the risk of financial panics?

Technological advances have led to self-service banking through money cards, communications banking in the form of intra- and inter-bank networks, telephone banking by consumers and direct-user contact with a bank's data base. New services include cash management, check return substitutes through communications, bank card enhancements with logic capability and transaction management.

By the 1990's most of the boundaries between financial services organizations are expected to be down. About 65 to 75 percent of the funds will come from retail customers with automatic teller machines handling most of the routine transactions. Personnel will be moved primarily to selling. To keep interest returns competitive, fees for services will provide an alternate source of income. Fees can also be used to motivate customers in their selection of different types of financial services. A major battle among the financial institutions will be to determine who will be the financial counselor to the retail marketplace.

A session on the future of health care delivery featured several speakers from the U.S. Department of Health and Human Services. An interesting observation on the level of health care costs is that many of these costs originate outside the health care system. Examples of these are accidents and injuries, poor environmental conditions and the graying of the population. Another major factor contributing to increased health care costs is the cost of energy since hospitals consume about twice the BTU's per square foot as other public buildings.

A number of different health care scenarios are possible within several possible future scenarios for society as a whole. A continuation of our present economic growth would lead to health care that is physician centered and involves highly centralized facilities and specialists. In a future society that is constrained by reduced energy supplies, one might expect to see more care for acute conditions provided through hospitals with reduction in the use of hospitals for rehabilitation and mental health treatment. There would probably be increased emphasis on diagnosis via telemedicine. Under a more authoritarian society, emphasis might be placed on a regionalized system of publicly financed health maintenance organizations with no private practice. This could evolve into a community health care system to monitor the



health status and keep computerized records on every citizen. In a transformed society one might envision health care being delivered via communications, education, local clinics and holistic approaches involving many assistants and paraprofessionals. Eventually this could lead to the development of in-home interactive health care terminals with emphasis on self-treatment and education.

A group of educators and communications specialists presented a fascinating panel entitled "The New Net-WORKER". The theme of their panel was that the spread of personal computers and the growth of electronic information exchange systems is transforming the way workers and the public will interact with society's institutions. Conferences or educational classes may be held without everyone having to be together at the same place or at the same time. It is now possible for a group of persons in diverse locations to work jointly on writing a body of text. By leaving computer messages, telephone tag can be avoided and employee productivity improved. Portable computer systems with telephone hook-up capability give even added flexibility. The new networking of persons via computer and telecommunications is defining whole new communities as "communities of interest". Within the corporation this will lead to a flattening of pyramidal management as institutions become more democratic and ideas become more important than hierarchy.

One implication for the life insurance business is that a community of interest network may be a market for insurance if a concise and agreeable approach can be made via the computer-telecommunications medium. Computer networks could be used to educate agents on their own individualized schedules or to allow employees at home or in remote locations to work together on problems. How would insurance companies respond if networking policyholders formed a community of interest and began to question company decisions?

MR. KRAEGEL: Each of us attended roughly five percent of that conference in Washington, and each of us has copious notes and is giving you only a small part of what was experienced. I am curious to know, how many of you attended the World Future Society meeting in Washington, in June of this year? (Two, besides members of the Panel.) I've attended in my 35 years with Northwestern Mutual Life, well over a hundred conferences, and I have never found more exciting and more rewarding conferences, than those of the World Future Society. So, next time there is one, you may wish to attend. The WFS is planning a conference on International Affairs in 1985, and probably another General Assembly in 1986.

Now to some specific sessions at the Washington conference. The keynote speaker was Bob Edgar, who is a member of Congress from Pennsylvania. He is also the chair of the Congressional Clearing House on the Future, which is supported through the budgets of about 100 Representatives and 25 Senators. He said first, "We need two visions: We need the eye of the ant, which picks up a crumb larger than itself, and with single-minded determination and purpose, carries through the job. We also need the eye of the eagle, which means seeing the big picture". Isn't that a marvelous description of the actuary? He suggested that we are the first generation to really plan our future and to be able to alter it. He thought the WFS conference would help us to monitor the future, to market the future, and to manage the future -- a good alliteration.

A few words on cities. Some of you, I know, are involved in your own community affairs, either as public-minded citizens or as representatives of your company, which may well be concerned about the future of the urban area in

which you are housed, or as both. One speaker suggested that we have an interesting change in focus: we are having a decrease in nationalization of local problems, at the same time that we are having an increase in the localization of national problems. Examples of the latter are the interest and activism in the areas of nuclear freeze and foreign markets. He mentioned that 19 states now have offices in Tokyo, for example. Another speaker talked about cities as part of an open one-world economy. For example, Akron is still the rubber-tire capital of the world, but they no longer manufacture many tires there. Rather, it is the knowledge center for tire manufacturing; it is the professional hub, with spokes doing manufacturing all over the world. He suggested that there was a time when we thought that suburbs could get along without the central city, but that is generally regarded as not true anymore. Perhaps they can get along, but they cannot get along nearly as well. There are a number of vital aspects that central cities bring to the whole urban area. Further, he suggested that the new view is to recognize the vital factor which human capital plays in our cities. He suggested that we need education, aesthetics, and redesign in order to attract the kinds of minds that we want to have in our cities. If we can attract good minds who are able to conceptualize and see how to do things, the jobs will take care of themselves.

One of the speakers was Betty Friedan. She wrote what I believe was the opening shot in the Feminist movement, The Feminine Mystique, about 20 years ago. Friedan commented that more than 50 percent of women are now in the working world, but that most are still involved in low-paid service occupations. She suggested further that the women's movement had two stages. The first stage emphasized equality of opportunity for women in a man's world. And some progress has been made there. The second stage, though, is potentially more significant. She objected that it is not enough just to have the male model and more women in it, but rather that we are now beginning to put values based on feminine experience into the balance. As women move into decision positions, we will see a transformation, new values and new priorities, which reflect a more balanced view of the male and female perspectives. These trends are extremely important to actuaries, both in the employment sector and in the market.

A quick comment on environment to supplement what John said. Lester Brown, president of World Watch, emphasized the need for new economic policies, because our current ones are consuming the base on which our economy depends, in the areas of oil, soil and forests, particularly. I might add water to his list. Brown believes we are consuming the base on which our economy depends. If that is not ultimately important to life insurance companies, I do not know what is. For some of these resources, we are not talking about many years in the future. In the case of water, for example, within 20 or 30 years we may experience extreme shortages in the bread basket of America. Coupled with eroded soil and more expensive fertilizers (oil), that is going to affect our own ability to feed ourselves, let alone our ability to feed substantial parts of the world. He suggested that threats to the United States are much greater from the collapse of the economic system than from Soviet aggression.

Another panel session was on the topic: "Improved Perception as Basis for New World View". The moderator was Frank Feather, president of Global Futures Network in Toronto, and formerly a bank planning executive in Montreal. He suggested that we use globes instead of maps, and turn them upside down to get a new sense of reality -- "the southern hemisphere is where the real opportunity is". He had an unkind word for MBAs -- "they act as if there is no life for the corporation after the next four months".

The second panelist on perception was Willis Harman, senior social scientist at SRI, International (and a Ph.D. in electrical engineering -- a remarkable combination of left-brain and right-brain thinking). Harman believes it is important to be visionary about the long term, but realistic about the short term. He suggested that science is biased toward the things you can measure, and against the spiritual. Our scientific world is not complete reality, but only one version of reality. To illustrate, he believes that our national security program has not helped us to feel more secure, and that a simple nuclear freeze will not do the job. What we really need is a fundamental change in perception about international relations, defense and conflict resolution. And that is only one of many major problems facing society. Altogether it looks like an insoluble mess, but it is not insoluble, because we made it through our perceptions. To solve it we need to change those perceptions. He suggests that society is facing a situation analogous to that of an alcoholic. An alcoholic cannot cope with family problems, financial problems, or work problems. At one time the alcoholic could cope, but in the bottom of despair, those problems become insoluble through a shift in perception. Therefore, by stopping the alcoholic perception, solutions to normal life problems once again become possible. But that shift in perception is not easy. Harman concludes that we have bought into a belief system which includes limitations that are not there. We need to change course in defense policy, economic policy, and environmental policy. Our problems are based on our perceptions and our solutions must be based on our perceptions.

Willis Harman was also a member of another panel, which considered the impact of perceptions on a more personal level. He related certain experiments under hypnosis in which the subjects had immediate physical reactions to purely mental suggestions. For example, one man under hypnosis was told there was a brick wall directly in front of him and that he should hit it with his fist; he did, and immediately his fist began to show bruise marks from the impact with an imaginary wall. Consider the possible implications of this complex and mysterious mind-body relationship on human morbidity, even on mortality.

Speaking on the future of democracy was Barbara Marx Hubbard, an early candidate for vice president of the United States. She believes that we are evolving from a representative democracy toward a deeper level of self-government based on self-organization, self-development and awareness of the relationship of the part to the whole. Further, we need a new function in democracy to facilitate greater citizen participation in decision-making. She sees innovations at the cutting edge of every field which, if taken together, can solve every problem we have. But we must become more aware of what is going on, so we need an Office of the Future at the cabinet level.

Five major concerns of the third world were given by Rashmi Mayur of India (third world coordinator for WFS): (1) Human biomass, increasing at 80 million per year, 6.2 billion by 2000; (2) Disappearance of trees -- losing 78,000 square miles of forest on earth in 1984; (3) Desertification of land -- losing 23,000 square miles to desert on Earth in 1984; (4) Malaria -- from 16,000 cases in India in 1966 to six million in 1984; and (5) Supercities -- the ten largest cities in 2000 will be third world, all in the southern hemisphere.

A panel of architects spoke about: "Building Intelligent Habitats." Roy Mason of Washington, D.C. commented that the city of tomorrow will depend on where the family is going and on technology. The importance of the chip in the future will be comparable to that of the auto, electricity, elevator and

telephone in the past. In the near future we will be able to get any information we need via a terminal, including newspapers. He designed Xanadu, a future-oriented foam house in Orlando, with \$250,000 of electronic gear.

Also in the architectural vein, but in a separate session, was a presentation about three-dimensional cities by Paolo Soleri (someone spoke for him), creator of Arcosanti, near Phoenix. He predicts they will come. Such cities were considered "crazy" 20 years ago, "maybe" 10 years ago, and "probable" today.

Clement Bezold, of the Institute for Alternative Futures, moderated a panel on community goals projects. Speaking of anticipatory democracy, Bezold said that the more open communities are to the future, the closer they move to a transformation -- a decentralized, ecological, self-actualized future.

One panel related to "The Quest for Global Security", including four prominent speakers: two from the U.S., one from the Soviet Union, and one from the People's Republic of China. The Soviet panelist, from the Academy of Sciences in Moscow, offered at least one idea that has not been widely discussed: "To maintain the balance (of military power), it is necessary to accept the security not only of your own side, but of the other side as well."

The dean of the behaviorist school, B.F. Skinner (Walden Two, Beyond Freedom and Dignity), spoke on "The Future of Behavior". Why is so little being done to solve problems? Skinner postulates that there are certain characteristics of human behavior that may be the cause of the problem -- and may make solution impossible. Certain characteristics which helped early humans to survive are now having the opposite effect, e.g., partiality to salty and sweet foods, sexual pleasure to assure reproduction, propensity to hurt others. Actions of government, business and religion's emphasis on "happiness" in the next life may cause us to consider current life as expendable, influencing our views on conservation. As another example, people wish to do many things through government, and thereby miss the pleasure of doing something for themselves and for others.

Finally, an intriguing idea for idea evaluation comes from Edward de Bono, a renowned British consultant. It is called PMI, which stands for Plus-Minus-Interesting. The idea is to consider an idea from those three perspectives -- what is good about it, what is bad about it, and what is interesting about it. Spend one minute (or an hour) on each perspective. The intent is to develop a balanced view, based on the concept that if you wear blue glasses, you see blue; if red glasses, you see red.

I will close with a side comment made by one of the speakers: "Many professionals are too busy to be involved". Too much busy-ness may be shortsighted.

MS. MELUSO: Some other sessions that I attended at the World Future Society conference looked at the health-care system, at regulating cancer risks and at genetic engineering. Last week at our annual TAP conference, we also had a presentation on probable breakthroughs in medicine with respect to cancer, stroke and heart disease. First, I want to look at a panel discussion on the health-care system by various people in the public-health field. Among the problems they cited is that the current system pays for the treatment of diagnosis and not the whole person, although holistic treatment in medicine is a prominent topic these days. Another problem in health-care service is that most patients do not seize the learning opportunity available to them via illness. There can be some learning value, but this is not instructed, it is

not given to patients and this is something we should try to do. Another problem is that the medical system emphasizes acute care hospitalization, while other components of health care are neglected. Much of this leads to the biggest problem which is the expense of health care.

We have heard quite a bit about self-care, and its growing importance, and about the emphasis on illness prevention, health maintenance and health promotion. Something else that I found new and interesting was the emergence of Social Health Maintenance Organizations (SHMOs). As well as providing health care, SHMOs offer social care which is the coordination of patient needs other than medical needs. In other words, if you are bed-ridden at home, in addition to your medical needs, perhaps you need someone to cut the lawn or go get your prescription at the pharmacy or something like that. These are growing, primarily in California.

Another area that was discussed at the conference was genetic engineering. We had several different people give us a discussion on the actual techniques of genetic engineering, which I will skip over today. The United States is taking the lead in genetic engineering, but our closest competitor is Japan. Japan, unlike the U.S., has a very good arrangement with their government whereby they are receiving investment funds for additional research in genetic engineering. There is some indication that they may overtake us in this field of research. Right now, most genetic engineering research is going on in the pharmaceutical arena. But in the future, it is projected that most of the applications will be used in agriculture. Some of this is taking place in California and in Arizona where there was supposed to be a test of a particular piece of genetically-engineered material that would prevent frostbite, I believe in potatoes, but there is a court ban on its issuance. The panel did, however, have a very strong concern over the use of genetic engineering in warfare.

Regulating cancer risks was another topic. This involves roles of science and government in identifying, evaluating and controlling carcinogenic substances. There are quite a few different recommendations. First, there needs to be an improved scientific testing in environmental health hazards. Next, we need to step up protection of workers who use hazardous substances in their work. It was also recommended that there be stricter FDA guidelines for possible cancer causing agents, and that there be increased attention paid upon carcinogenic imports. I don't know if anyone remembers a story that broke last year in the spring, about a Mexican steel company that had shipped radioactive table legs to the United States; Customs didn't pick this up. Obviously, they don't usually check for radioactive material. What had happened was that a hospital in Texas had some old radiology equipment which they donated to a hospital in Mexico. It was installed in Mexico, but the hospital had no technicians to run the equipment, so it sat there, and after several years they decided they would throw the thing away, and it was sent off to some dump, and the dump later sold the radiology equipment to a steel plant in northern Mexico, which melted it down including the radioactive parts. They made steel out of it that was shipped around the world but primarily to the U.S. So we have a problem with importing products that could be cancer causing agents.

At the TAP conference, we were working with Ted Gordon, who is president of the Futures Group, in identifying possible breakthroughs in medicine affecting life expectancy. I would like to look at just a couple of things, primarily dealing with cancer, since this is the second leading cause of death in the United States. There have been great advances in knowledge as a result of new

technology, and the first new technology that has enabled us to find out more about the cause of cancer is new imaging techniques.

For the last six decades, most of our imaging techniques have been X-Ray-oriented. And now we have computer-imaging techniques, such as CAT Scans. Another piece of equipment which has been developed is called NMR, Nuclearmagnetic resonance machines. Unlike other kinds of imaging techniques, this does not use any kind of ion radiation to produce an image. Nuclearmagnetic resonance machines, it was explained to me, scramble the rotation axis of atoms in the body by putting the body in a huge magnetic field. Once you are removed from this field, the spin of the axis of the atoms in the body, primarily hydrogen atoms, lets out a little radio beep. This radio beep is then picked up by the computer and the computer will produce an image, not only of hard tissue, but of soft tissue. This allows medicine to actually see soft tissue, which allows you to look at tumors inside the body before you have any kind of surgery performed. A couple of hospitals have this equipment, but it is very expensive.

Another area of advancement in medicine is genetic research. This includes production of human chemicals such as human insulin. There is also production of what we call mono-clonal antibodies. These are proteins that are produced outside of the body that bind themselves to a particular antigen in the body, and these can be used as markers. They are used in radiology, as markers to identify particular problems in the body. They can also be used for the delivery of drugs and they can be used outside the body in testing.

Another research area related to cancer is research in oncogenes. Oncogenes, according to Ted Gordon, seem to be genes that cause cancer, or at least they are genetic information in DNA which result in a predisposition to cancer. All of this information is coming together at a time, according to most of the research in the Trend Analysis Program and via our consultants, when there are on the horizon potential breakthroughs in cancer research.

MR. DESAI: Are there any studies or data that we have in TAP analysis that would tell us the value of heredity or genetic predisposition, not just to cancer, but to other problems such as circulatory, the heart, etc. and identify as screening criteria; hereditary factors as opposed to other factors that we actuaries have in screening like age, diet and blood pressure, etc? Are there any studies that relate to this?

MS. MELUSO: There are a couple, but they are not produced by TAP. They are just things that we have been researching. You did bring up an interesting point about genetic screening as a potential. We talked about this at the conference as a possibility in underwriting, not only asking if you smoke and your age and your sex, but submitting you to some sort of genetic screening.

MR. KRAEGEL: I am aware of a physician in Indianapolis who won a major award about 10 years ago for a process in which he interviews patients regarding a variety of characteristics. From these very useful profiles, he develops a health potential for each particular individual, with suggestions for life style, diet, etc. I don't know what has happened to that since, but it may be a direction to explore.

MR. BOOTH: It is interesting to note as we discuss the use of genetic characteristics to classify risks that the one major genetic characteristic that is used in risk classification today is the sex chromosome. Sharon, was there

any indication at the Trend Analysis Program Conference that we are close to having the ability to make genetic changes in humans?

MS. MELUSO: Not that far away. I believe the leading areas of research in this are in diabetes. What they are trying to do is locate the particular gene, the particular part of the DNA that is linked to causing diabetes, and be able to slice that out and put in a healthy part.

MR. DESAI: Regarding your statement that third-world countries may repudiate their debt, I don't know what the bankers can do. It brings to mind the statement Lenin made many years ago that "Britain will out expand itself, Germany will out fight itself and the U.S. will out lend itself."

MR. BOOTH: A major danger is that the borrowing nations might join together and collectively repudiate their debts. This could have tremendous repercussions throughout the world financial system. If this were to happen, one consequence might be that there would be no more advances of capital to these countries which could have a crippling effect on their plans for development. I believe it is widely recognized that it is in the best interests of both debtor and creditor countries to find a way to work out of the debt problem gradually.

MR. CHRISTOPHER S. MOORE: Many of our publics look on actuaries as futurists, even though that may not be what we are. They feel we do have a role to play in areas involving life and death and health. However, I have to agree with the comments that were made in the first half where Wil Kraegel and Grace Dillingham were both commenting that a good futurist has a combination of the analytical thinking and the more holistic or right-brain thinking. It seems to me that the actuaries should be getting a more detailed, more structured approach in our education in order that we can develop more futurists among us actuaries. I realize we have the Futurism Section, we have sessions like this where we report on activities, but with a broader based training in the futurist skills, couldn't we not only be listening to comments, but also initiating more of the types of remarks that we heard today?

MR. BOOTH: Certainly as actuaries we should be concerned with learning organized techniques for finding out what the future might hold and how we might deal with it. One very good speaker on the subject of environmental scanning techniques was William Ashley, director of issues management of United Airlines, who had formerly worked for Sears. He emphasized the need for corporations to engage in "outside-in" thinking in planning for the future. "Outside-in" thinking recognizes that in today's world social, political, economic and international factors are replacing customers, employees and suppliers as having a major influence on the success of a business. There are more external challenges to corporate legitimacy. The old view that external problems swing back and forth in importance like a pendulum is being replaced by the spiral representation. Each time a problem comes back it is escalated to a higher level. Much of corporate culture is caught in a bind that resists the idea that society is changing and fights to hang on to a declining industry. Managements might do well to remember that nothing good lasts forever because someone wants to share it. For example, as housing prices have continued to escalate, a Japanese company has developed an automated housing assembly which enables a house to be built in one day.

Faced with a multitude of large and small external issues which may or may not have an impact on one's business, how does a person go about "outside-in" thinking in determining corporate policy? The first step is to tie inside

planning with outside planning. Most inside planning begins with monitoring trends in the business, making forecasts as to the production and distribution of various products, setting corporate goals, implementing strategy to achieve those goals and then repeating the cycle to update intelligence and make adjustments to improve corporate performance.

Outside planning, which involves a separate planning cycle, can be tied into the inside planning cycle by making the two cycles intersect at the forecasting stage. The outside planning cycle involves scanning the outside world for issues that may impact the business, evaluating and ranking the issues and making forecasts as to how these issues might affect the business. These forecasts are merged with business forecasts and taken into account as the corporation adopts its goals and implementation strategy.

Scanning for outside issues involves looking at the major components of change from various perspectives which are indicators of future trends. The major components of change are social, technical, economic, and legislative/regulatory/political. Different perspectives for looking at these components can be characterized as surface indicators, institutional or structural forces, and values or lifestyles. For example, a surface indicator might be a newspaper report on housing starts. Indicators in the form of institutional or structural forces might be family formations or births. An example of a changing value or lifestyle indicator is the increase in the market for "mingles" residences defined as condominiums with two master bedrooms for two wage earners living together as partners.

Scanning resources should be selected for their expected richness. For example, in scanning within the legislative/regulatory/political component, one might look at 108 terms used by Congressional Research Service to classify legislation. One should also select resources that will indicate emerging issues before they reach the major news magazines since by then they will have been elevated to major policy items.

Once issues affecting a business have been found, they can be ranked on a scale of -100 percent to +100 percent on the basis of the product of their importance to the business, their probability of occurrence and the degree to which the business has the ability to change their outcome. In ranking issues it should be noted that some issues with positive effects and others with negative effects on a company may be interconnected so that trade-offs may be involved.

Where does a company cut off the list of critical issues? As a rough guide, the American Council of Life Insurance (ACLI) maintains a periodically updated list of about 40 issues which are considered of concern to the life insurance business. Some of these issues are only monitored while four issues are ranked at the top of the list in their command of industry attention and resources. One large life insurance company is reported to concentrate on six major issues in terms of allocating resources and planning strategy.

In managing issues that have gained media attention, it is important to realize that the media may not tell us what to think but they do tell us what to think about. In public issues opinion is fact. To manage a media issue, one must define the issue to win the debate or redefine the issue to win the debate. As an example, Federal legislation to ban the use of sex classification in the determination of insurance rates was originally defined as an extension of civil rights. Only after the issue was redefined as an economic



issue of profound significance to the insurance industry and its policyholders was it given more careful consideration in Congress.

Sharon, would you tell us something about how the ACLI Trend Analysis Program scans for issues?

MS. MELUSO: The Trend Analysis Program has been going on since 1970. It was in response to a Future Outlook Study for the life insurance business. This was started over concern of changing relationships in marriages and birthrate and what would be the future demands on life insurance. It started out as a little-known program and now is well-known both within and outside of our business. The basic premise is that trends in the social, political, economic and technological environment can be spotted in the news media. We read about 150 different periodicals, looking for indicators of change in these various environments. We read everything from Mother Jones and Rolling Stone to Newsweek. We have volunteers from life insurance companies pick a particular periodical, read it on a regular basis and then abstract pertinent information which is sent in to the Program and analyzed. We have about 120 or so companies doing this activity for us. There are several companies which have their own in-house trend analysis programs. The material that we gather together in the abstract form is then analyzed by a committee of people at the Council who are representative of our different divisions, Economics, Administration, Social Research, etc. Out of this bimonthly analysis, we put out a report called Straws In The Wind. At year's end we get together with our TAP Steering Committee, and we try and pick out roughly four topics which need further analysis. We work with consultants and conduct research throughout the year on these topics, then produce a report called the Tap Report. Much of the material which we covered at the conference this last year will be published in the form of TAP Reports.

MR. BOOTH: I would highly recommend Straws In The Wind. This report contains little threads of information and bits of insight that suggest many areas for further investigation. Sometimes you can imagine where they might lead, sometimes you cannot, but each item of information could have some significance.

MR. BAYO: I want to congratulate the panel for doing an excellent job in summarizing the meeting. I was there and I think you did a very good job. I would assume that you do not necessarily share the views you are reporting, you are more informing us of what happened there. Particularly about the Latin American debt, there were strong implications in several of the meetings, that the Americans are to blame for the debt because we have pushed the money on them, by lowering the interest rates, much below the going rate in the market. And so, we have to share the responsibility. I had a comment also with respect to an observation by Wilfred that the futurists are open-minded. I do not share that view. I share the view that they try to be open-minded, but I have found plenty of them that are not.

MR. KRAEGEL: I agree. Perhaps we should say on average, they are.

MR. DAVID S. WILLIAMS: In the discussion this afternoon, you have put your finger on a number of target events that may be of great significance to the life and health insurance industry. A number of trends need close watching. Futurists would like to analyze these events and trends very closely and try and write scenarios which tie them all together to produce a plausible future as to just how things are going to unfold over the next 20 years, the entire environment in which the life and health insurance industry is going to be

operating. This is what would really be of interest to the Society and to everyone associated with the insurance industry. Interestingly enough, a think tank called the Center for Futures Research, in California, has done just that over the last year or so, and they have produced a study called the Life and Health Insurance Industry to the Year 2000. Over the next year, the Futurism Section will be examining the work they have done and reporting on a lot of the implications and the techniques, and commenting critically, so that we can learn and perhaps use the study as a point of departure to make our own plausible future extrapolations. So, if you keep in touch with the newsletter and keep an eye on what the Section is doing over the next 12 months, you'll see some interesting results flowing from this.

MR. BOOTH: WorldView '84 was an enormous event that offered an opportunity to have a great many glimpses of possible futures from various perspectives within a short period of time. If the comments of the other panelists sound as if they attended a different meeting, it is an indication of how diverse and wide-ranging a selection of topics were offered. In the face of all the changes that are taking place in our business today, there may not be too many managements who feel there is no need to look into futurism. However, those who have not yet learned "outside-in" thinking might consider that the Chairman of Atlantic Richfield Company is quoted as having said, "Financial success for a corporation is irrelevant, it is public acceptance that counts."