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**PLANNING FOR FUTURE STATE: FORCES FOR
CHANGE IN RETIREMENT SECURITY PART I**

Moderator: ROBERT W. RYAN
Panelist: EDITH WEINER*

What are the demographic changes, business restructurings, shrinking social values, and changing government roles that will occur in the next 20 years?

MR. ROBERT W. RYAN: This program has been arranged by the Futurism Section and is the first of what we plan to be a continuing series of future-oriented programs.

Our keynote speaker is Ms. Edith Weiner. Edith is president of the firm of Weiner, Edrich & Brown, a prominent New York City consulting firm. She is an author, frequent speaker, and active consultant to some of the largest organizations in the U.S. Her career includes both government and private sector experience. Edith is considered to be one of the most outstanding and dynamic futurists in the country.

MS. EDITH WEINER: Let's take a look at some of the social changes that we see on the horizon for the next ten years. First, we will continue to see a proliferation of many new household and family configurations and types. We just came through several decades where we saw enormous changes take place in household definition and configuration, and the Census Bureau here in the U.S., and even in other countries, is starting to have a very difficult time keeping up with all the changes. For example, there is one Census Bureau definition of household that says, single male, head of household, with children. Now who is in that household? It assumes, for most people, that there is in that household a single male, by himself, with children. In the majority of those households, there's also a single female, and some where all of the children may be hers. But because there's a male in the household, he's considered head of household, and he is single, and there are children.

So the problem that we have now is that if the Census Bureau were to reflect accurately what is going on with households, there would be fifty household types, and that just doesn't work as a banner. So we're not even looking at what we should be looking at when we try to understand what's happening with households and families.

And as we go forward, there are several types of households that typify some of the ones that are emerging. For example, male only households and seniors living with nonrelated individuals. We expect to see a lot more of those. Also, parentless households where there are children and neither one of the biological parents are in that household. In some cases, there may not be any parent in the household. And one that I find very interesting, and we see cataloged nowhere, is the true multinational household where someone is working and earning a living somewhere in the world and sending all or part of that money home to the rest of the household in

*Ms. Weiner, not a member of the sponsoring organizations, is President of Weiner, Edrich & Brown Incorporated in New York, NY.

some other part of the world. And that's happening for every income class in every part of the globe, whether we're talking about Jamaica, Puerto Rico, India, Russia, Israel, North Korea, South Korea; wherever you look, you see multinational households proliferating.

We're also facing a decade where we have to start coming to serious grips in the industrialized world with the aging of the very old, or the aging of the population in general. Along with that, we have, of course, the aging of the baby boom in the U.S. and Canada. And then along with that, we have the aging of the children who were born as the baby boom echo over the last ten years, moving into their teen years in the 1990s. For those of you who really would rather be attending a session on profitable investments, I would suggest that you invest in pharmaceutical companies because acne medication and things like Rogaine are going to go off the chart over the next ten years.

I'm going to make a very controversial statement, that here in the U.S. we have already witnessed the decline and potential disappearance of the middle class. Now I want to be very careful about this. I'm not saying the middle income. Middle income is a statistical notion, something a few of you may understand, but it basically reflects a population that has a high and a low income range, average it, and you have your middle income.

Middle class means something else. Middle class is a set of values and expectations that people used as a measure of how well they did as opposed to how well they might have done, or how well somebody else did, as they progressed through life. And as we look at those values and expectations, we take them one by one and consider what's happened to them. Number one: My children will do better than I will. Number two: A good education assures you of a good livelihood for the rest of your life. Number three: I can expect a safe and secure retirement if I do the right thing and work my whole life. Number four: Throughout my adult life, I will be employed, never unemployed, and I will have a steadily rising, and expected income stream. Number five: Throughout my adult life, I will live in a stable family relationship. And there are a few others, but that's an indication of how far we've come from leaving the middle class behind.

Those five are no longer operable for a great number of people in this population. And so one of the problems that we have going forward over the next ten years is that people are struggling to figure out what it means to be middle class, what the definition of success means, what they should be telling their children, who they should be comparing themselves to, what they should be feeling good about, what they really ought to be trying to achieve, and what they should leave behind. It is a very difficult time for struggles, attitudinally and valuewise.

I'll make another controversial statement, and that is that everyone in this room is already on the verge of achieving, and some of you probably already have achieved, immortality. Now for this group, that's got to be a fun comment. The fact of the matter is that immortality basically means what? It means the ability to experience generations and generations and generations worth of living. Five hundred years. Eight hundred years. A thousand years. There are two ways to achieve that. One is

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to live in real time, 500 years, 800 years, a 1,000 years. And the other is to be able to experience all of those years in whatever time you live.

Today, in the course of two days, you can go to Epcot Center in Florida and experience more in those two days than your great-great grandparents experienced in their entire lifetime.

Today, we can take a trip to China and back for business. There used to be songs about a slow boat to China, and it used to take years out of a person's life in order to experience that. Increasingly, we're capable of going back millions of years, and through virtual reality, we'll be able to do that even better and actually roam through Jurassic Park among the dinosaurs. And five minutes later, we'll be able to download the information that we're getting back from NASA and then change the whole software in our virtual reality setup and walk the surface of Mars. That's something that we would not be able to do in real time for another several hundred years.

So we have the ability to master future time and to experience everything that will be going on, not just perceptually, but biologically. We are fast coming to the point where we can create our great-great-great-great-great-great-great-great grandchildren in petri dishes and not have to wait the hundred of years it would take to see what the product of those combinations and offspring would bring.

So given the technology and given the fast pace of experience, what's happening is that people are burning out and getting bored much earlier in their lives because they're experiencing much more far more early and they're living to be a lot older. Today, we hear a lot of 45 year-olds saying, what am I going to do with the rest of my life? Today, we hear a lot of ten year olds saying, mommy, daddy, I'm bored, what else? And they have everything available to them. This is going to be a continuing problem going forward.

We see the rise of the underclass everywhere throughout the world, and here, again, I want to be very careful in a definition of this. Underclass is not synonymous with poverty. There are many very, very poor people who are part of the underclass. They are on welfare. They're struggling. However, they do buy into the mainstream economics and mainstream culture, and mainstream norms and mainstream laws and expectations. And they want their children to succeed.

The underclass is marked by those people who have basically become alienated from and disenfranchised from the mainstream economy and the mainstream society and its norms. And so it's the underclass that we really have to take a look at it because we can't tinker with that through our economic models. These are people who really cannot, will not, do not want to achieve. We have to take that seriously going forward because it is on the increase.

We're looking at a decade where we're going to see rapid fire adaptation of school alternatives. We're seeing a lot of different initiatives all over the country. We will expect to see many more of those, and school and education will start to mean something very different at all stages of a person's life, but most certainly in the primary education areas.

We're seeing mass migrations around the globe that are continuing over the next ten years, turning whole countries into other countries. The U.S. is now the fourth largest Spanish-speaking nation in the world. Throughout Europe, the U.S., Canada, the entire Northern Hemisphere is becoming southernized. Very shortly, not just regions within countries and cities within countries, but whole countries will be turning majority minority, which is to say that the minorities will be making up the majority of the population of those countries. And that's going to change a lot in terms of culture, politics, expectations, economic behavior, and so on.

We can expect to see the resurgence of diseases in industrialized nations such as we thought we'd never see again after the turn of the century. And there are a lot of things that are happening to force that to happen. First is something you've all been reading about, the resurgence of antibiotic resistance and antibiotic resistant strains of diseases. That's number one. Number two is the liability crisis that faces pharmaceutical companies and so they're out of the vaccine businesses, or just won't produce a lot of things that need to happen. Number three is the crowding and the hopelessness in urban centers around the industrialized world, which promotes the growth of a lot of disease. Number four is the importation of more goods from the tropical countries from the southern hemisphere. We have the capacity now to bring in many organisms through those imports that carry strains of diseases that northern hemisphere's populations do not have natural immunities to. For example, it was discovered a few years ago that we were importing tires from Asia, and within the threads there were ticks that carried dengue fever. We just don't have the oversight capacity to be able to control all of that constantly.

Along with that, we have more illegal immigration that is going on from the Southern Hemisphere. Again, the reason I am stressing the issue of the Southern Hemisphere is because history has told us time and time again that more populations have been susceptible to exposure to diseases when there was not natural immunity of that population. We do not, as northern populations, have a lot of natural immunities to a lot of the organisms that the southern populations do.

And so as population mix changes, we can expect to see a lot of those diseases carry through a population. And there are a number of other things that are feeding into this, but the fact is that combinations of many forces are causing us to anticipate a serious disease problem. Of course, we can potentially match that with technology, and I'll talk a little bit later about that.

And then privacy, of course, is certainly a key social issue going forward. We had been talking about Big Brother of 1984 for so many years: large data banks compiling information on people, and people losing their ability to control information about themselves. Well, the fact is that the real threat is coming from exactly the opposite direction. It's not coming from Big Brother, it's coming from "Little Brother." On the main street of every city and in so many catalogs and magazines now, you can read where you can buy hidden microphones, hidden tape recorders, telephone bugs, telephone anti-bugs, encryption, and de-encryption devices. All of the James Bond stuff is now being made available to the person on the street to do whatever he or she wants. And we know, for example, that now in many job review situations, employees go in wired, and they record the entire job review because they know that, if the boss is out to get the employee, the boss will deny what he or she said,

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or say something different. And so whether it's telephone conversations or in person, or for industrial spying purposes, or anything else, we have probably less control over, and more to fear from, the ubiquitous nature of spy technology and privacy-invasion technology than we do from any central or large data banks.

Let's take a look at some of the political trends going forward. We will continue on the path toward devolution or neopopulism, which is the move away from the federal centers of control, and much more toward local and grass roots control. We're going to see many more women in the political arena. It's already happening in a number of countries around the world. In Canada, we have many more women in Parliament. In the Scandinavian countries, even in Africa and in Asia, we're seeing major pickups in the number of women who are playing on the political scene. And as a result, we can expect that some of the issues that have been of greater concern for women, including family, education, the environment, community, and so forth, will gain in importance on the political agenda of many countries around the world.

We're also going to be seeing enormous changes in the judicial systems. I'll talk a little about this later, but the fact is that, when women become lawyers and judges, the entire notion of juris prudence begins to change.

We are moving into a decade where we will see decreasing relevance of the lines of distinction between the three major sectors: private, not-for-profit, and government. These three sectors are increasingly looking, behaving, budgeting, marketing, and reaching the customer more and more as if they were the same. And that's simply because in a time of shrinking monetary resources for individuals, if you have a dollar in your pocket, the government wants it as a dollar in taxes. Not-for-profits want it as a dollar in charitable contributions. And the for-profit sector wants it as a dollar for consumer purposes.

Not-for-profits are starting to market to you to get your charitable dollar as if they were getting a customer dollar. And the for-profits are saying, we do cause-related marketing. We're really good guys. We support everything. If you spend your money on this, so much of your money is really going for not-for-profit causes.

And you have government privatizing, or basically trying to offer services that compete with the private sector, or make itself look like it is suddenly accountable, and operating and budgeting just as if it were the private sector. So it's getting harder and harder to really distinguish among the three in terms of the messages they're giving out. Ultimately, the one way that they will merge is in terms of their accountability structures, and we expect to see that happen.

We also see the declining relevance of nation states on a global basis, and that has profound consequences for us. There are four major reasons that nation states, manmade lines drawn on the globe, are losing their relevance politically. First is technology. Technology does not respect these man-made drawn lines. It migrates over boundaries. No government can control or release information at its own whim. Today, 24 hours a day, 365 days a year, technology is opening up information channels all over the globe.

If we go back, for example, to China and Tiananmen Square, the Chinese government made every attempt it could to control information flowing out of that country. It didn't let anything that was outside come in and didn't want anything that was happening to go out. But here in the U.S., there were Chinese students on campuses who were dialing random fax numbers in China and sending over the front pages of American newspapers because the government could not stop the generation of information over the fax numbers, especially dialed randomly in China. So there's no way technology allows for boundaries to remain intact, to remain sovereign.

Second is economics and markets don't allow for the sovereignty of those boundaries. Most corporations that are global are penetrating those boundaries. Most people want to buy goods and services from outside. Even France, a country that really wants to keep out Western culture and American culture, finds that 40–60% of its programming is American in content. People will tune into that because they have the ability to get that through satellite and through video, even though the country is trying to keep that out. So markets and economics really do not limit those boundaries.

The third major force is the migrations I talked about before. Countries are becoming whole other countries, and they are taking on the nature and the characteristics of other peoples and other agendas.

And fourth is the environment. Problems with the environment and their solutions do not know any man-made bounds on the globe.

Now given the fact that those national boundaries are becoming less relevant, it falls to us as people who are in the futures research business to figure out what the new boundaries are going to be because the fact of the matter is people need boundaries. Human beings need boundaries. They don't operate well without them.

So as we look to the future, we try to figure out what those new boundary areas are. One of them we know is going to be the global corporation. Global corporations are increasingly taking on a lot of the prerogatives that nation states once had. They're the ones that are getting involved in everything from trade to human rights agendas. In fact, we will see more human rights agendas promulgated through the marketplace and global corporations than we will through governments that exist currently on the map. I would also say that with global corporations, you see things like security forces that rival the security forces of small countries. You see talk of things like corporate democracy, corporate history, just very interesting sorts of political things now associated with corporations that are global.

The second kind of boundary that we see emerging is one that is basically ethnic or religious in scope. You see movements toward smaller areas such as in the Balkanization of Eastern Europe all the way to movements that slice horizontally across the globe, such as the Nation of Islam. However you look at it, large or small, there are very potent boundaries forming around religious and ethnic affiliation.

A third kind of boundary that we see, and I'm going to make another one of my controversial statements, is that there is really anthropologically and sociologically no difference between the lines that are forming around the world to get into country

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clubs and the growth of street gangs. They are the same exact phenomenon. Why? Because this is a way that in a very uncertain and threatening environment, where people feel that they really don't have the power that they should over events in their lives, that they find a way to identify a geographic turf, mark it out and find a way to protect it. They find a way to associate with like-minded people, find a rite of initiation, which you have to pass in order to get into that protected turf with like-minded people, and then status accrues to those who are a part of that entity. There's no difference; it's just you take it where you can get it.

For those people who are very concerned about the growth of street gangs all over the world, I would argue that, until we get a handle on the phenomena that are causing people to want to join country clubs, we will not be able to solve the growth of street gangs.

We're going to move into a decade where we will increasingly see the phenomenon of health wars. Not that we should be allocating any more money in our budget overall to health and health care, but given the amount of money we do, what should it be spent for? We're increasingly seeing young versus old. Should we be using the money for things like Alzheimer's research? No. We should be using the money for prenatal nutrition. That's our investment in the future, not in people who are older already. Should we be using the money for women's issues and breast cancer? No. We should be using more money for AIDS. In New York, we call Seventh Avenue the war of the ribbons. If you wear a pink ribbon, you are in support of breast cancer research. If you wear a red ribbon, you are in support of AIDS research. You can walk around with two, one, or none, but the point is everybody has a cause and is saying we need more of the resources.

Along with this, we expect the next decade to usher in a major growth, underground industry in health care. There will be more trading around the world in body parts, more imports and exports of pharmaceuticals and compounds and materials that are not sanctioned by country oversight functions. We're just going to see a major underground health business over the next ten years. Furthermore, we expect to see the furtherance of the stewardship doctrine taking hold. What is that? Back in the late 1970s, a lot of people were saying that environmentalism was dead. It had gone away. Nobody was talking about it. It wasn't on the front pages of the newspapers. It was finished.

But we had an inside track in monitoring one of the sectors that nobody else on the social-science scene was really paying as much attention to as they should have, and that was the religious environment. From some of the most moderate and conservative pulpits around the world, we were seeing a redefinition of Genesis taking place. What ministers were telling their congregations was, look, I know you thought Genesis said that man had dominion over the earth and all of its resources. That was the dominion model. But that was a mistake in interpretation because what God really said is, hey, humankind has stewardship for the earth and all of its resources. The difference between dominion and stewardship is the difference between night and day. Dominion served very well as an industrial model, as a basis for religion. It basically said, I'm making you people the smartest of all of whatever I did because you can now go forward and use those brains and that intelligence, to go and build, and create, and basically exploit to your advantage.

What stewardship was now saying is, no, no, no, no. You got it wrong. The reason I gave you the brains and all the other advantages was because I wanted you to be my gardener. I wanted you to take care of everything else that I put here. I wanted you to return it to future generations in as good as or better shape than when you found it. That difference in dominion versus stewardship started to pump a whole new fever into the issue of environmentalism, into business ethics, and into the notion of community and family. It started to say that basically all of those very short-term, very short-sided, very exploitative things that you've been doing under a dominion model are not correct.

The importance of this is that we were no longer talking about fringe or very liberal elements that were involved in this, or little old ladies in tennis shoes who were saying, it's not nice to hurt animals. In fact, a profound difference just in that one area alone was that it was no longer a question of it not being nice to hurt animals. What stewardship was saying is that we didn't have the right to hurt animals. That posed a whole different challenge to corporate America, the corporate world, and businesses, and so forth. We will see the furtherance of that stewardship doctrine as we move toward and through the 21st century.

Most important, in terms of where the new edge is pushing, we are learning that the focus on quality that so many companies have had for the last ten years has been misplaced. Quality is not where the attention should have been. In fact, we see in so many companies that try to create a quality focus that has been breaking down, and is not able to be sustained. That's because the real focus under a stewardship model is not quality, it's integrity. From integrity, quality flows, and you don't have a problem. But if your focus is on quality, you don't necessarily get integrity out of that and quality eventually breaks down because it cannot be sustained. Integrity is basically open, honest, and fair dealings with all or one stakeholder. So we're going to see more of that kind of subtle shift toward integrity over the next ten years.

Let's take a look at some of the economic trends that we can expect over the next ten years. I'm going to ask you a question. What is the largest business dollar volume on a daily basis in the world today? Currency trading dwarfs all other trade and goods and services by 50 times every single day. Every single day more money changes hands and more currency is traded on the open markets than is contained as reserves in the central banks of all the industrial nations.

Now I'm going to ask you the second question. How many people are employed in that business? Not very many. This is anathema: an economy, as we move toward the 21st century, in which the single largest business employs perhaps the fewest number of people in the world. When we get to where we have this kind of situation, all of our economic models break down. All of what we thought we knew about economics begins to break down. The old ways of assuming, thinking, and modeling just don't work anymore.

We're moving into a time where we are finding our gross economic indicators less and less useful. Let's take a few examples. Let's take gross domestic product (GDP). Look at GDP and try to figure out what happens when the underground economy of the U.S. is anywhere from 13-28% the size of our GDP. At 20% the size of our GDP, our underground economy is the equivalent of the above ground

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economy of Canada. And we have the smallest underground economy in the world as a percentage of our GDP; not as a total, but as a percentage.

Every other country you look at, whether it's Israel, Peru, Italy, or Germany, has larger underground economies than we do as a percentage of its GDP. Some of that is captured in our statistics. Much of it is not. Every year there's an \$80 billion sinkhole in the world where cash just disappears. It disappears. We don't even know where it is. That's American dollars, by the way. Eighty billion American dollars disappear every year. We know the money is going into envelopes and mattresses and wherever, but it's gone.

Let's take a look at countertrade. I can't get very good statistics on this, but the best I can get out of the Commerce Department is that anywhere from 20% to 25% of global commerce is done on the basis of countertrade. Barter is a very big component of countertrade. So are other strings-attached kinds of deals. I will sell this product, or build this plant and employ people in your country if, in return, you will allow me to open these markets. I will charge less for what I do but, long term, this is what I want. Or, perhaps, we as a country will allow you to come in here and market that product to us if you give us a licensing arrangement on the product knowledge, or on the ability to manufacture, or whatever. There are strings attached all over the place. I will give you straw mats if you give me tractors. I'll trade the tractors to an airline company that will give me the seeds. So I'll trade those with a publishing company. This is what is going on domestically and globally, and we are not capturing this in our statistics.

As we move towards services and intellectual property, we don't know what we're doing when trying to measure these things. We don't have a clue as to what services are worth. We don't know what intellectual property is worth. The U.S. has a fabulous balance of payments relationship with the rest of the world, but we can't measure it based on our industrial measures. By those measures we don't look so good, but the fact that Arnold Schwarzenegger is known by every individual on the face of the earth creates a lot of wealth for us. So we're just having to struggle over the next ten years with the fact that we have more and more sophisticated ways of gathering and modeling the data, and they're telling us less and less about what we're supposed to know.

We have to come up with alternative ways of gathering new and alternative data to figure out the value of what is happening. I will give you one small indication of this. Right now, we don't know how to value information. One of my clients is the American Institute of Certified Public Accountants (AICPA). That group is still struggling with how to value the asset that is information.

Very quickly, we're moving into an environment in which the time value of information is becoming critical. For example, information may be worth a great deal at the moment that it's generated. A minute later, it may have less value. An hour later, it may have far less value. A week later, it may be worthless. It may start as being of incredible, enormous value. In currency trading, for example, information could have billions of dollars of value, and an hour later, it could be worthless information. If we don't even know how to value information, how do we value the compounded

element of the time value of information? These are the things we're going to be struggling with over the next ten years.

Additionally, within the tort system, we're going to see a movement away from liability and toward accountability. In the beginning, what the public wanted from organizations and individuals who did the wrong thing was accountability. But we did not have well-designed accountability systems, and our recourse was always the courts. So our liability system got totally out of hand, and now we're in a situation where we're starting to see legislation to control the liability crisis and the liability problems. With that will come elevated accountability. If it is no longer viable to take a corporation with deep pockets and sue it for \$5 or \$10 million, or \$2 billion, or whatever, because there's a cap, then what will happen concurrently is that the executives of that corporation, were they found to be neglectful or to have done something willfully to harm the public, will be criminally liable and will be personally attached monetarily and perhaps imprisoned. So we're moving from the liability side to the accountability side, and we're going to see a lot more accountability pushed into the system.

One of the most important economic trends that has been going on and will continue to go on is a term that you should burn in your brains because this is changing the nature of the entire economic landscape: the term is *disintermediation*. It's a \$25 word with billion dollar consequences. Disintermediation is a term that began in the 1950s to describe what happened when people took their money out of savings banks and shopped around for higher rates of return provided by other alternatives, new financial instruments and institutions, thus disintermediating the banker who had been the traditional intermediary for an individual and his or her savings.

In the interim years, between the late 1950s and today, we have seen disintermediation change the face of delivery system for every good and service, including professional service, in the entire marketplace. A quick definition of disintermediation is the bypassing of the traditional delivery channels for goods and services. There is not a profession, service, or good that has not been affected by this, and will not go on to become profoundly and continually affected by disintermediation.

Twenty-five years ago, if we wanted to buy a briefcase, we would have gone to a department store, or a luggage goods store, or maybe an office supply store, but certainly not to a catalog, or television shopping, or a craft fair, flea market, or any other of the many, many alternatives available to us today. Twenty-five years ago, if we needed medical attention, we went to the tripartite system of delivery. The doctor, a hospital, and the pharmaceutical company provided what we needed. None of those is sacred today. All of those are having to market like crazy. Doctors are becoming corporations. They're being disintermediated by books, by alternative medical delivery systems, by storefront delivery systems. Hospitals are becoming boutiques. They're setting up outpatient clinics and providing everything you might possibly want to know, or do, and however you want to look for whatever you want to pay. The pharmaceutical companies are being disintermediated by discount drug chains, generics, catalogs, and are even having to buy wholesale-buying companies that are in there for cost control.

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So the whole picture has changed. Doctors, lawyers, and actuaries are all on the line. Everyone is on the line for disintermediation because software programs are out there that can do what a lot of technicians used to be able to do, what a lot of professionals used to do. Other institutions and competing consulting organizations are starting to do what others had control over within their own professional priesthood. That leaves the challenge for people to start thinking about what they really are going to be in the future as opposed to where they're coming from.

Let's look at some of the technologies and changes that are out there on the horizon. I talked about virtual reality very briefly. Virtual reality is the tricking of the human brain into believing that it is somewhere else, doing something else, or experiencing something else in real time. We are capable of approaching that, and perhaps even conquering that, both mechanically through electronics, computers, and virtual reality systems, and medicinally through pharmaceuticals and drugs. We are getting to the point where we're able to start tailoring drugs to manipulate the brain into sensory beliefs that are not real time occurrences.

Currently, we have virtual reality technology that allows us to don a mask and gloves, load some software into a machine and have an architect walk into a building that he or she has only designed. That individual can walk through that building and look at where the windows are, open them, feel how high the low beams are, see if they like the space, the expanse, the feeling, and everything. They can feel they were in that building without a brick ever having been laid.

Currently, there is capability being used in Japan that allows a person who wants to put cabinets in the kitchen to bring a blueprint of the kitchen into the showroom. It's downloaded into the computer and the person puts on the goggles and the gloves, then walks into his or her kitchen and starts taking all kinds of configurations of cabinets and trying them out, opening the doors, reaching in. Do you want the dishwasher on the left or the right? Do you like the way this door opens? Do you like the height of this? Do you like the color of that? And then when the customer is done testing it all out, the salesperson can order the cabinets that the customer really wants in the kitchen.

We currently have the capacity for a biologist to walk inside of a molecule through virtual reality. He or she can see 360 degrees, touch, feel, and establish where the strength is best throughout that molecule to begin extending polymers. That's what we have today, and yet it's still very, very primitive.

We are fast making inroads on far more sophisticated virtual reality technology, and that's going to change the nature of every kind of endeavor throughout the economy. Whether we're talking about vacations, education and training, or even the kinds of projections we make about the future. The modeling, the scenarios, everything will be altered by what's going on in virtual reality technology.

How many of you have heard the term *nanotechnology*? This is another term that you have to become familiar with because it's going to be out there. Nano means one billionth. Nanosecond means a billionth of a second. Nanometer means a billionth of a meter. We are starting to be able to create robots that are nanometers in size. In fact, we are now creating robots that are molecules, molecules that are

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created by us to perform the work of little robots. We are able to now measure time in nanoseconds, a billionth of a second. That is incredibly significant.

We know a very prominent futurist, a technologist, who has been pretty accurate throughout the 25 years that we've been in this business in looking at the future of technology. He has projected that in 15 years technology will become 5,000 times more efficient, meaning 5,000 times smaller, 5,000 times smarter, 5,000 times faster, and 5,000 times more friendly.

Now I personally have trouble thinking about technology being 100 times smaller than it is today; 5,000 is mind boggling. And it's going to change all of our manufacturing processes, all of our biological processes, all of our knowledge processes, all of our experience processes, everything profoundly.

We've all heard of desktop publishing. That's the ability to take \$5,000–10,000 worth of equipment, put it on your desk and look just as good as any major publishing firm and publish something that some audience will want to look at. And there are proliferating niche audiences out there that want material that is really projected toward them.

There's a publication called *Fact Sheet Five*. It's one of the many that we monitor on a regular basis. *Fact Sheet Five* comes out whenever it feels like, and the print is so tiny that you need a magnifying glass to read this publication. It is a review of the thousands of *zines* that are on the market. Do you know what *zines* are? *Zines* is short for magazines. These are publications that have subscriptions of less than 1,000, less than 20. These are just small issue publications, and there are thousands of them. The fact is that desktop publishing is changing the entire publishing and information landscape. The reason I raise that is, although that is major and going forward, what is happening alongside that is desktop manufacturing.

Desktop manufacturing is our ability to manufacture in a very small space, maybe the space of one-eighth of this room, what it used to take three city blocks, and major buildings, and equipment and workers to produce. Vitamin C is an example. Through fermentation and genetic technology, we can create vitamin C in a vat that's quite small compared to what we used to have to set up in order to manufacture vitamin C.

Have any of you ever heard of stereolithography? Stereolithography is a technology that is now being used to develop prototypes for manufacturing facilities. Basically it is taking a vat, maybe the size of three dining room tables, putting within it a polymer, a resin, or a ceramic that is photosensitive, then taking a computer-programmed laser beam slice through that material at perhaps nanometers. Everywhere the slice through occurs, the material hardens. So that in an hour, you pull out a manufactured part based on a software program, a laser beam, and some material.

Now if you can imagine ten or fifteen years from now walking into an auto supply store and you say to the fellow there, I have a BMW, this year, this model. My doorknob broke. And then, instead of having to order that part, or inventory that part, he pulls out a software program from a shelf, sticks it in a computer and the material in the vat starts to harden wherever the laser slices through and he hands

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you your doorknob. Imagine what desktop manufacturing is going to do to the warehousing business, to the manufacturing facilities business, to the transportation businesses, to the bricks and mortar businesses, to the machine-making businesses, to inventory processes, and so on.

We're also moving very quickly down the road over the next ten years to the mapping of two very important biological areas—number one, the human brain and number two, the human genome. Both of those are going to have profound consequences going forward. Let's take the human brain first. We are fast determining and discovering how the brain works, what some of the differentiation processes are, and what happens in different parts of the brain. We're also learning about the hormonal effects on the development of the brain.

We did a book last year called *Office Biology*, which was kind of an aside on what we do, and the most fun that I have had in researching a book. Actually, it's a book that many of you would probably be interested in because you are actuaries. But the chapter that I had the most fun putting together, because it contained information that I personally had not been as exposed to throughout the years, were the gender differentiations in the brain. What science has been teaching us over the past 20 years is that male and female brains are physiologically different from each other. Well, of course, a lot of us knew that anyway. But now science was confirming a lot of the things that we sort of knew.

The fact is that every human being at conception has a female brain, everyone. Within five to six weeks after conception, those embryos that are coded xy, which are to grow and become male, are programmed to shoot a much higher dose of testosterone through the system than the xx-coded embryo. Now all embryos are exposed to testosterone, and basically human beings are arrayed on a spectrum that is pretty much bimodal in what we think of as male or female based upon testosterone exposure and its implications for the brain and the physical development of the being. If you take this bimodal distribution, it means we're all arrayed somewhere along this spectrum. We have a lot of females who have male pattern brains, and males who have female pattern brains, merging toward the center of the distribution based upon hormonal exposure and patterning.

In general, what happens after that first five to six weeks, when the pattern is set and the amount of hormonal exposure takes place, is that the xy embryo goes on to develop a male pattern brain, and that male pattern brain is a highly specialized brain. Spatial reasoning becomes much more highly developed because of the specialization processes.

In the female brain, within the corpus callosum, which connects the left and the right hemisphere, 10–20 million more connections are formed between the two hemispheres. What you have in the female brain is a highly interconnected brain, and what you have in the male brain is a highly specialized brain.

So for the sake of humor, I call the male brain the "out to lunch" brain because, when the male brain is focusing on the solving of a spatial problem or any other problem, even in computed tomographic (CT) scans you find that only one center of the brain, that center that is engaged in what the problem is about, is engaged. If a

male is looking at something, or perceiving something, only the visual centers of the brain are engaged. If a male is adding up figures, only the calculation center of the brain is engaged, and the rest is very quiet.

I call the female brain the "pinball machine" brain because as soon as something goes in it starts rattling around all over the place. It never comes out the way it went in. And if you look at a CT scan when a woman is attending to a problem, you see electrical firings all over the brain. For example, when a woman is looking at something, she is perceiving from memory, from hearing, from senses—which is why women are thought to be intuitive. That's because they are picking up many different clues while they're also looking visually. Women can see many more shades of red. Women see far better at night. Men see far better in the glare of day. There are just major physiological patterning differences that have occurred.

The reason that I'm even going into this in as great a depth as I am is because there are major implications in this as we move forward into the 21st century in terms of the way that the next economy is going to be structured. And shortly, we're going to go into that next economy and talk about what it means. But the fact is that we are moving into an interrelation economy. We're moving into an economy that is less dependent upon administrative skills, although it does depend on those very much so, but it implies much more need for interrelation skills.

Now let me give you an example of male-female pattern thinking as a generalization given the fact that we are bimodal, and we do fall at different points on the distribution. If John is called in by the boss and the boss says, John, we're looking at business strategy. Here we are today at A, and our goal is to get to B. How do we do this? John will take this problem, and in as much time as he is given, he will figure out how to get from A to B, and it will be an organizational model of how to get from A to B.

Mary is called in by the boss and the boss says, Mary, here we are today at A, and our goal is to get to B. How do we do this? Mary's first thought is, why B? You know, who determined B? Well, if that's so and if we have to work with B, then let me explain something for you. If we don't do G, R, W, and X, it doesn't matter if we get to B because B is not going to hold up. It's going to fall apart. So we have to think about doing those things as well. Furthermore, I think if we do Q and R, we can do better than B much faster once we get there. And that's why typically men think that women are addle brains, and women think that men don't get it in the business environment.

In the future, it's very clear to us that while a lot of women-owned businesses have trouble succeeding because they don't pay enough attention to the operational details, a lot of other businesses will not succeed if they don't pay attention to the strategic details, which are interrelational. So what we're saying is that there is now tremendous physiological evidence in support of mixed brain thinking and problem solving for successful organizations going forward. And that's really the first time we've ever had that. We've always had cultural pushes toward that, or political pushes toward that, but they're actually physiological backups toward that now.

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Also, in mapping the brain, we're learning much more about learning. We're finding how people learn better, how different individuals learn better. We're finding why it is that we can't plug in our VCRs and make them work. That's because past the age of 25 or 30, most people feel they have to read the manual. Anybody under the age of 15 won't even pay attention to the manual. That's why the younger people can plug it in and the older people can't. The manuals don't help you plug in the VCR and make it work. They're not designed toward how the human brain understands and functions. And we're just finding all kinds of things like that are very interesting going forward.

I don't know how much time I have to spend on mapping of the human genome. I think you're all aware of the fact that the original projections that James D. Watson made was that by the year 2005 we would have mapped the human genome given the human genome project operating in three countries on super computers simultaneously, crunching numbers to crack the human genetic code. Watson himself moved it back to 2003. It has since been moved back further to 2001, and I would bet at least a dollar that we will have fully cracked the human genetic code before the turn of the century. That is having already profound consequences on all of our biophysical futures.

Today, we see buried in publications that we read that we have found a marker for another major disease, or problem, or illness. Twenty years ago, that would have made the front page of *Newsweek* or *Time* magazine. It's just becoming expected. We're improving our understanding of so many things that are genetically related, and the implications are going to be mind-boggling.

In terms of people's lives and living, one of the major fundamental shifts going forward, certainly here in the U.S. perhaps more than anywhere else in the world, which will have a major impact on the future of pensions and retirement planning, is a term that we call transitioning. The trend in the 1950s was that people were sort of middle class, stable, hanging together, and able to really plan for their future.

In the 1970s, the trend was that people were making more transitions in their lives. They were getting married, divorced, remarried, redivorced, remarried. They would go to school, stop, and then at some point, go back to school for their MBA or whatever, and then go back to work. They would retire early, not like it, and decide they wanted to go back to work.

The trend for the 1990s and beyond is not that people are making transitions in their lives. They have become so accustomed to seeing those transitions made in their own and everyone else's lives that they are moving into what we call the transitioning lifestyle, which is that nobody anymore wants to commit to any sense of being able to project the future. When you ask somebody today, who do you work for, the answer is, well, currently, I'm, you know. Are you married? Well, currently, you know. Do you have children? Well, currently, you know.

The issue is that nobody knows anymore where five years from now they're going to be financially, professionally, maritaly, geographically. We just don't have that control anymore over our destinies, over the ability to plan. We just don't have that control,

and people aren't willing to commit to a belief that they're going to be somewhere for certain.

We all know that on a Sunday we will drive 20 miles to a flea market to save ten dollars on a power tool, and Monday we'll walk into Bloomingdale's and pay a 500% markup for a sweater. We know we do that. We're not schizophrenic. We just feel differently between Sunday and Monday. On Sunday, what we're about is husbanding our resources because we don't know what's going to happen, and we're proud of how we know how to save. And on Monday, somebody patted us on the back, said, good job, and we're proud that we have the ability to spend. From Monday to Tuesday, we're different people. From January to February, from one year to the next, we're different people.

So when we look at financial planning going forward, when we look at jobs going forward, when we look at who we are individually and collectively going forward, one of the keys is that none of us knows, so collectively, the swarm is not quite sure.

Now let's take a look at the economy that is emerging out of all of this. Here's a bit of history first. The U.S., as are all other nations in the world, is still an agricultural economy. However, we are no longer an agricultural society, and that's because we only need 3% of our population working in agriculture. Therefore, we were able to shift all of our societal mechanisms into the next economy that replaced agriculture, which was the industrial economy. The U.S., as are many other nations and all of the industrialized nations, is an industrial economy. We are an agricultural economy and we are an industrial economy, one layered over the other. But we have moved very far away, at this point, from an industrial society. How did that happen? Over the thousands of years that there was the agricultural economy, people lived on farms, lived in small communities in rural areas, and had social fabric and structures around that agricultural environment.

But a confluence of technology that occurred in the late 1700s began the seeds of the industrial revolution because those technologies created efficiencies in agriculture, efficiencies in the way work was being done. That meant fewer people needed to be employed. We had several hundred years over which time we moved people out of the agricultural and into the industrial economy.

Beginning with World War I, but truly in World War II, we had another confluence of technologies that created enormous efficiencies in the industrial model. We had the capacity to use far fewer people employed in industry, and we created a postindustrial economy to absorb that work force. Now we had thousands of years in the agricultural economy globally. We had a couple of hundred years in the industrial economy. The problem that we have now is that we only had 40 years in the postindustrial economy before new technologies started to come along that created enormous efficiencies.

All of those jobs that just ten and twenty years ago everybody said to go into are the businesses that are downsizing. We don't need as many people in financial services the way we did in the institutions that delivered them. We don't need as many people in computer services the way we thought we did when those businesses first came along and grew. So it isn't just the General Motors that are cutting. It's the

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Xeroxes and the IBMs, and the American Expresses that are also experiencing this because we now have tremendous efficiencies in the postindustrial economy.

Now where are we going? Given the fact that we don't need all those people employed there, what are people going to do? What's the next economy? An economy is very much defined by the jobs that people start taking and what they do, and how industries regroup given the fact that they don't need to do what they did before.

We looked at what other people came up with as terms and conditions for this next economy. Peter Drucker calls it the "knowledge economy." He's very right. Very much of this economy is predicated on knowledge. But that term doesn't help us see it, taste it, or feel it. It doesn't help us figure out the businesses and industries that are going to prosper. Other people call it the service economy, the information economy, the leisure economy, or the communications economy. None of those help us. So we came up with a term for this next economy that we think will be very helpful to you. The term that we've given it is the *emotile* economy. The best thing about it is it doesn't mean anything to you, so you carry no baggage with it, and we start fresh.

Emotile is a neologism. It's a combination in equal parts of two terms. Emote or emotional, and motile, mobile, nothing fixed, nothing permanent, everything moveable, everything temporary. The emote part is a kind of proxy term for heightened concern for personal well-being. Concern for personal well-being will drive the next economy and in a form, in everything we do, that is not fixed, that is totally impermanent.

There are five components to the emote side that will determine the growth businesses and industries, and how people will be employed, and even where actuaries may migrate and apply their talents over the next ten to twenty years. Those five components are, number one, augmentation of intellect, and there are three pieces to that—education, entertainment and information. These are three major growth areas. More importantly, they are all depending upon each other. They are undergirding every other kind of business and service. You cannot sell running shoes today without informing, entertaining, and educating. And you cannot be in the movie business today, or the entertainment business, without having extremely sophisticated information technology at your disposal. And you can't educate anymore without entertaining because nobody has the patience to listen to education without entertainment. So you get all of those wrapped up together, and, furthermore, they undergird everything else.

The second component of the emote is health. There are two pieces to that—physical and emotional. Increasingly, we're finding they're one and the same. But for those people who are concerned that health is now 13% of GDP expenditures and want it managed down to less than that, the good news and bad news is that health will go up to 20% of GDP as an expenditure. And not because of the inefficiencies in the system. Let's hope we can manage those down. It will go up because that is where we're electing to spend our disposable income as we move into this next economy. We're spending it on our health emotionally and physically, whether it's stress reduction, or aromatherapy, or Rogaine, or cosmetic surgery. Whatever we're

spending it on, we're spending more and more to make ourselves feel better physically and emotionally.

The third component of the emote is security, and there are two pieces to that—personal physical safety and financial security. Both of those are big, big, big growth areas in the economy, many more businesses, many more people employed there, much heightened concern. I would even argue that there are certain things that we account for in our budgets that we misallocate in terms of where we should be accounting for them. For example, 80% of all of the money that is spent on private school education should be allocated towards security expenditures. There's no question in most people's mind that one of the reasons, in fact, the major reason, that they're sending the kid to private school is for the safety and the security. We see Catholic schools growing in enrollment by non-Catholics who believe that it is even safer to be in a Catholic school than in some of the private schools.

The fourth component is customized service: individualized, personalized service. We see so many entrepreneurial growth areas in that field, and we see so many large dinosaur institutions now having to catch up and do that. Because of disintermediation, the customer is very well aware that, if you don't give this to him or her, somebody else will. Whether that's your shoe, your bicycle, or your baby, this ability to customize and personalize is going to be out there.

And the fifth major growth area under the emote is spiritual fulfillment. Religion and ethnic affiliation is big, big business and will continue to be big, big business. It's drawing down big bucks. So are all the alternative churches that are out there, including the 12-step programs. Stewardship businesses were once volunteer kinds of things but more and more we're seeing marketization of stewardship businesses. Public advocacy groups are now professionalized. People get paid to do this. It's not just a question of volunteering. More people want to run for office and so on.

So that's the emote side. Those are the growth businesses. That's where people are going to find jobs, and that's where they're migrating to.

On the motile side, there are three components to that. Number one is ways of getting things done. Whether we're talking about manufacturing, or communicating, or working, or distributing, nothing anymore is fixed. Everything is able to be bypassed, changed. It's all temporary. It's all portable. It's all mobile.

The second is ways of interrelating. Whether we're talking about families and households and communities, or peers and work cohorts, any way that we're talking about interrelating with other people, these are becoming far less permanent. In fact, if you look at what the Internet is, it is a perfect example of a motile community, very real, very supportive, very solid, but not at all based on geography.

And the third component of the motile is ways of viewing the world. Increasingly, the view is more relativistic and transcendental. We have moved beyond Newtonian views of the world, beyond Einstein views of the world, to where we're looking at not physical or mechanical, but biological feedback mechanisms, chaos theory, quantum physics, actually supporting paranormal phenomenon, just a lot of very interesting stuff.

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I want to take a few concepts for you that we pulled through the four economies and the societies that went along with them so you get an idea of just how much change we can expect going forward as a result of the emotile economy and the society that will form around it.

Let's take the notion of time because time is very central to a society and to an economy. In the agricultural era, time was seasonal. It was based on the calendar and nature ruled people's lives through time. Time was based on nature. It ruled our lives. We had no say over it.

In the industrial era, we started to gain some control over time because we invented the clock, and the clock allowed us to basically organize time around a day, a work week, a work shift. And if you know your history of clocks, you know that in the beginning they weren't ubiquitous. There wasn't a clock in every home. There was one clock for miles. The clock keeper would get on a horse and ride through the town and say, eleven o'clock and all is well, because nobody had a clock. Not very many people really needed them.

But when we moved full scale into the industrial society and the economy that was underpinning that, everybody needed clocks. It became a much more important tool of the economy and the society. And as technology allowed that to become ubiquitous, we started to organize time. As more people had clocks, more people organized time around clocks, and organized their lives around moving toward a city and being close to where they had to be when they got up, and in the evening when they left work during the week.

In the postindustrial economy and the society that followed, we had the computer. And now we were gaining a lot more control over time. In fact, the computer allowed us to defy night and day, and it allowed us to measure time in tenths, hundredths, and thousandths of a second.

I'm sure all of you watched all or part of the Winter Olympics this year. Those Olympics could not have been held 35 years ago. We would have had ten or twenty ties in every single speed event, speed skating, bob-sledding, downhill racing. We could not have distinguished the winners in any of those events.

But because we are able to measure time in tenths and hundredths and thousandths of a second, we had to develop materials that were aerodynamically designed, clothing and equipment, so that we could get that extra tenth or hundredth or thousandth of a second performance. And because we were able to do that, we changed the nature of not only materials technology and what we do with that, but also we created a situation in which 15% of all high school athletes were on steroids because they, too, had to engineer another tenth of a second out of their performance.

We also created sports medicine so that we could engineer the body to perform a tenth of a second better. And with that, created medicine and applications that effect many of us on a daily basis. So just that one application, measuring time to smaller and smaller amounts in sports, has changed so much on the landscape.

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In the emotile society, what time will become will be irrelevant. It will not control us in any way anymore. It won't tell us, it's night, stop working. That will be irrelevant to us. It won't say, it's nine o'clock, you have to be at the office. That will be irrelevant to us. It won't say, it's eight o'clock at night, this is the program you wanted to watch. That will become irrelevant. We'll have access to that whenever we want. It won't say, this is spring, now you can grow your crop because we can grow that crop any time of the year anywhere we want to. It won't say, you cannot walk the surface of Mars for another thousand years, because we will be able to do it through virtual reality. So time will become practically, for all real purposes, irrelevant.

Let's take the notion of wealth. What was wealth in each of these eras? Wealth in the agricultural era was farm land, real assets, such as, crops, seeds, live stock, and many sons. And even in those countries where there's still very heavy agricultural societies, this is still what wealth is, real assets and many sons.

In the industrial era and in those countries that still have heavy industrial components to them, what is wealth? It is a large home, capital assets, savings and pension. Remember the industrial era was built on the Protestant ethic, and the Protestant ethic was about savings and pensions.

In fact, for those of you who are not aware of this, Adam Smith was really a social philosopher, a moral philosopher. He was not an economist. His greatest contribution to modern economics was that he basically said, it is fine to earn money on capital, to create wealth from capital bases. It was a sin for most populations at that time. In fact, the reason that the Jews grew as money lenders and as bankers was because many of the other inhabitants of the areas in which they lived found earning interest on income to be a sin. And, in fact, what Islamic financiers have to do, as they cope with the 21st century, is a little semantic dance by saying that they do not lend money and gain interest. They invest money and take out equity returns.

So the whole industrial era was undergirded by savings, investment, and pensions. In the postindustrial era, what was wealth? It was a large income, not your assets that you own.

In the emotile era, what will be wealth? It will be financial security, whatever that means to you. This is the first economy in which financial security is internally generated as opposed to externally compared. It really becomes very individualized. What do you need to feel financially secure, not how do you compare with some other person in terms of financial security.

Second, it will be emotional and physical well-being. This was never part of the wealth equation. We never said or felt that we were wealthier because we were physically or emotionally in great shape.

I'm going to add one last one, retirement. What was retirement in each of these eras? In the agricultural, retirement was not a factor. In the industrial era, Bismarck had set it at 65 because it was expected that people would live possibly one or two years after that, and so it was thought to precede death by maybe one or two years. In the postindustrial era, retirement became a third and long phase of a person's life. And in the emotile era, retirement will be nonfixed and highly individualized.