ACTUARIAL FUTURES

ISSUE 18 JAUNARY 1998

Chairperson's Corner

Who Are We and What Do We Do?

by Albert E. Easton

When I was asked if I would be willing to have my name placed in nomination for the Futurism Section Council, my first thought was to try to find out more about the Section. I'm a pack rat. I save old Section newsletters, and I had a pretty good collection of *Actuarial Futures* stowed away in my credenza.

Reading old copies of Actuarial Futures is a lot more fun than reading old newsletters from some of the other Sections, and it did help to convince me that this would be interesting, even if it

(continued on page 5, column 1)

In This Issue

The Actuary as Futurist

by Robert G. Utter

In late 1996, senior management of The Principal Financial Group (The Principal) in Des Moines, Iowa asked me to become the first company futurist. At the time, I was heading the Corporate Research and Development area, which was just beginning to explore what role futurism could play in our R&D. I had brought in a futures consultant to speak to R&D employees and some of the company management team.

Why a Company Futurist?

The Principal is a multiline financialservice company with a heavy emphasis on employee benefits and pensions. Other major lines include individual life insurance, group life and medical, international, asset management, and residential mortgages.

Like other companies, The Principal is affected by the rapid changes that are occurring in our industry. There are new competitors, both domestic and global; new customer needs as the population ages; new delivery systems as more customers become "wired;" evolving regulatory requirements and societal expectations.

The thinking at The Principal was that to be better prepared for the possible threats and opportunities that could arise, we needed to have a better understanding of the future and the forces that will have an impact on us. To do this, we need to look further out than is traditionally done in strategic planning.

What Is Futurism?

Futurism is the study of the future and contains a set of methods and tools for gathering information about, and gaining insight into, the future. Some of the more popular tools are trend analysis and extrapolation, crossimpact analysis, Delphi technique for pooling expert opinion, environmental scanning, issues management, and scenario building. A new SOA Study Note entitled "Applied Futurism" provides the reader with a good overview of futurism.

Futurism at The Principal

After discussions with senior management, we set the following goals for the development of futurism at The Principal:

- A widespread understanding of the forces, trends, and wildcards in the U.S. and the world that have an impact on The Principal and its businesses, as well as their implications
- The integration of futurism tools into appropriate corporate and business unit processes such as strategic thinking, strategic planning, new business/ product development, and so on
- A culture that encourages strategic discussions of the future, challenges and tests current strategies, asks "what if" questions, and anticipates possibilities rather than reacting to events
- A proactive mindset in identifying and influencing the possible threats, opportunities, and the "preferred" futures.

My Responsibilities

While my position is still evolving, I currently have the following responsibilities:

- To be the corporate advocate and resource for futurism
- To introduce appropriate techniques to senior management and business units and to show linkage to strategic planning, strategic thinking, and R&D
- To challenge current thinking by asking "what if" questions
- To understand and share the driving forces that will have an impact on The Principal in the future
- To create and present scenarios and essays on key areas for The Principal. I report to the Chief Financial Officer

(continued on page 2, column 1)

How to Deal with the Future

by Tom Hughes

Futurism, or at least futurism tech niques, is still in relative infancy compared to the more well devel oped disciplines that comprise actuarial science. There are probably several reasons for this, perhaps most notably the fact that futurism techniques are not deterministic, unlike virtually all the methodologies that we have acquired and applied in actuarial training and practice.

And to my way of thinking, therein lies the principal appeal of futurism as a field of study that will broaden our views of how to best deal with the fu ture. Futurism's nondeterministic tools give us the ability to better identify the range of possibilities of future out comes. Such a perspective is invaluable in assessing the relative merits of point estimates produced by traditional tech niques. When we must produce point estimates, futurism techniques will help us assess the risk of outcomes other than that predicted. In the event we want to "see" an indeterminate future that cannot be quantified, futurism can help identify the possible and often likely outcomes.

Given futurism's relatively new standing as an element of actuarial sci ence, we of last year's Futurism Coun cil emphasized programs and projects that were designed to inform and edu cate actuaries as to what futurism is, how it has been used in the past, and what it can do for us in the future. As evidence of this, consider the recent and planned activities of the Section:

- Alan Mills, Immediate Past Vice Chairperson of our Section, with help from Dr. Peter Bishop, our academic futurist from the Univer sity of Houston, has completed the revised Futurism study note for the actuarial exam syllabus. This rep resents a major enhancement of the actuarial literature on futurism, and it will be added to the syllabus as soon as practical.
- Similarly, futurism will be included in the revised education and examination curriculum currently being considered by the Society. The exact form and placement of this subject is to be evaluated in the near future.
- Our programs at recent and upcoming SOA meetings have included "Futurism 101," a primer on the subject that introduces basic princi ples as well as the new study note.
- Other planned Society meeting programs will demonstrate futurism in action, as futurist techniques will be applied during the sessions to real life issues of interest to actuaries.
- We are of soliciting research pro jects from various areas of the Society in order to have more tangible evidence of futurism's applicability to actuarial issues and problems.
- We have begun programs to inter act with the international actuarial community for the purpose of de termining how other organizations may be using futurism and its tech niques in their operations.

All this points to a concept, futurism, that is just beginning to be developed within our profession. The need for education, the use of outside experts, and the search for allies are all signs of the relative newness of the concept, and rapid growth can be expected at this stage of development.

All Section members are always en couraged to submit their thoughts on Section activities to Council members. Given this is the beginning of the year, your doing so now would be particu larly timely and appreciated.

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ACTUARIAL FUTURES
ISSUE NUMBER 18 JANUARY 1998

Published by the Futurism Section Council
of the Society of Actuaries
475 N. Martingale Road, Suite 800
Schaumburg, IL 60173-2226

Phone: 847-706-3500 Fax: 847-706-3599

World Wide Web: http://www.soa.org

This newsletter is free to Section members. A subscription is $15.00 for nonmembers. Current-year issues are available from the Communications Department. Back issues of Section newsletters have been placed in the Society library and on the SOA Web site: (*ww.w.soa.org*) Photocopies of back issues may be requested for a nominal fee.

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An Introduction to Visioning: Part II

by Peter C. Bishop

Editor's Note: Following is the second of a three-part series introducing the technique of "visioning." Part I appeared in the June 1996 issue of Actuarial Futures.

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The Forces of Change

The future is shaped by a complex interaction of forces whose outcome is in principle unpredictable. Nevertheless we can classify those forces in order to understand the dynamics of change. There are three forces of change corresponding to the three types of futures.

The first force consists of the constants and trends that drive the future in relatively wellknown and predictable directions. Constants are parts of the system that do not change. Trends do change, but slowly over long periods of time. Over the next 50 years, few expect the Constitution of the U.S. to change in fundamental ways. It is a constant in any plausible set of possibilities. The world population, on the other hand, could double in that same time period. It is a trend strongly influencing the future. Together constants and trends form the dataset for extrapolating the likely or probable future.

People who emphasize trends as the guiding force of the future think of the future the way a physicist would, as a track leading into the future. They believe there is generally only one track and that the future is singular. The track is made up of all the "presents" that link one after the other into the future.

That image may be correct as to how it will unfold, but by itself it is not useful for futuring. None of those unique and singular "presents" has happened yet, and we do not know which ones will. From the perspective of the present, the future is much broader than a single track. It is more like a growing set of possibilities that fans out into the future. The forces that drive the future down one area or the other are discontinuities or events, surprising developments that happen suddenly. One of the areas, the probable future, has no surprises (a surprising development in itself); the others are marked by discontinuities that could go one way or the other. Discontinuities come suddenly in jumps, rapidly directing the future into one or another area. Inventions, market crashes, revolutions are examples of discontinuities. They separate one "era" into another, leading to comments like "You know, before¼" The "before" marked another era, a different world where a different set of rules and relationships appliedthe "good ol' days," by some people's light. Discontinuities are games of chance, like poker or a roulette wheel. Just like fortunes in a casino, one's future can change suddenly and unpredictably, never returning to the "good ol' days."

Combining constants and trends with discontinuities creates a description of change that is different from the one we usually imagine. Although we admit that sudden change occurs once in a while, we are generally reluctant to include sudden change in our image of the future. It creates too much uncertainty and too much change. We would rather think of the future as a linear extension of the present. Of course, thinking that way is not very prudent. Driving down the highway at night, one can assume that the road proceeds in a straight line with only smooth curves. But if you forget about the possibility of sharp curves, stoplights or stalled vehicles, then you are in danger of an accident.

"Just like fortunes in a casino, one's future can change suddenly, and unpredictably, never returning to the 'good ol' days'."

Scanning the Future

An area that has adopted a multiple perspective on the future is simulation training. Individuals in highrisk occupations (pilots, astronauts, nuclear plant operators) must be trained to handle a countless number of contingencies. Rather than list all of them, however, they adopt a training regime that includes both the probable and possible future. The probable future for such professionals is that everything works as planneda nominal mission in NASA terminology. They train specifically to execute the maneuvers and run the machines that will achieve the mission objectives. The possible future, however, is that things do go wrong and contingencies do arise. They prepare for the probable future by handling those contingencies in a simulated environment. The difference between these occupations and decisionmakers in the real world is that astronauts and nuclear plant operators are running manmade systems. No matter how complicated, there is at least the possibility of mapping a large majority of the possible contingencies. The success of the space program and even the airline industry is evidence that they were successful in anticipating most contingencies. Other, "realworld" occupations, however, enjoy no such advantage. No one has created even a remotely valid simulator for a business or a government agency. People in those occupations have to learn how to operate their organizations in real time, without the benefit of simulation.

They do have one tool, however, that they can use—their imaginations. Just like the test engineers who must think up all the things that could go wrong, they need to scan the possible futures for the contingencies that could continued on happen to upset their plans. They don't

(continued on page 4, column 1)

Visioning

continued from page 3

get to run those contingencies on a simulator and train how to handle them, but that should not prevent them from imaging future possibilities at all. The futures approach is only prudent for those who must make decisions and take actions with longterm future consequences.

One reason that we do not scan the range of alternative futures is our belief that change results from gradual trends rather than sudden events. Trends are occurring all around us; significant events happen rarely. With trends, we believe we will have time to prepare and adjust to change. Although we know we may be caught off guard with events, their relatively low probability gives us a reason not to pay much attention to them.

"If we just stick with trends and discontinuities, however, we lose the third essential force that shapes the future, human choice."

This belief in the preeminence of gradual change also dates back to Isaac Newton and another eminent thinker, Charles Darwin. Darwin cast his theory of evolution in the form of gradual change. His original description of evolution was gradualist: imperceptible changes over long periods created the species we know today. But he did not have access to the fossil record. When paleontologists dug down into the ocean floor, they found a record of a different sort. They found long periods with very little change interspersed with periods of very rapid change. The disappearance of the dinosaurs and the emergence of the mammals was such a jump. The appearance of multicellular organisms was another. At first, there are none, and then they are all over. They called this type of change 'punctuated equilibrium,' long periods of relative stability punctuated with periods of rapid change. The discontinuities, whether asteroids from space or new life forms, marked the beginning and end of certain eras. Each era had its own character, its own system, its own rules and relationships for maintaining stability. When the discontinuity came, however, that era ended and with it its rules and relationships, giving way to a new set and on and on.

What is true of biological evolution is also true of social change. Marriage is a discontinuity that starts a family, birth of the first child another. Job change, divorce, death are all discontinuities that change the way a family functions. Organizations go through their equilibrium and discontinuous periods, as do societies. Indeed the human species as a whole is undergoing a discontinuity of growth and productivity that threatens even fundamental planetary processes like the atmosphere and other species. All open systems are subject to discontinuous jumps. Our image of the future must take that into account. Realizing that the current "era" is temporary, that it will change in the long run to a new set of rules and relationships, is part of being prepared for the possibilities of the future.

Human Choice

If we just stick with trends and discontinuities, however, we lose the third essential force that shapes the future, human choice. Trends and discontinuities happen to us, but choice allows us to get our two cents in as well. Choice is not unlimited. We are bound by the conditions of the current era, but within that, we still have some "wiggle room." We have the discretion to apply our time and resources to one set of priorities or another and hence affect the future differently. Those who emphasize human choice are enamored of the human potential to affect change and to create one's future. They emphasize the power of commitment and united action. "We shall overcome" is a statement about the power of human choice. The image is one of a powerful boat on the open sea. You can point that boat wherever you will, throw those throttles forward, and leap forward to the future you choose.

Just as with the other images of change, this image is incomplete. Trends by themselves cannot predict the future because nothing goes on forever. Unforeseen developments can stop or reverse a trend quite suddenly, and you are in "a whole new ball game." On the other hand, the future is not as random as a roulette wheel. We can see the way things are going and be relatively sure of our direction, at least in the short term. And finally, we do have some choice, but it is not unlimited. We still have to account for the forces that are more powerful than we are. On the other hand, human drive has surprised us more than once by its ability to achieve a highly improbable future.

The best image is one that combines all three. My favorite is a small boat, like a canoe, in a large river, like the Mississippi, approaching the delta. The Mississippi delta is a network of canals called passes that carry river water into the sea. Which pass will we go through? The trend is to keep on the way we are going, propelled by the current. But a discontinuity could emergea log, a storm, another shipthat upsets our canoe. Now we are swimming instead of ridinga different future indeed! Finally we have some choice. We can paddle to the pass we want, but the river is swift and our paddle is no match for it. We certainly can't paddle upstream, so if we want to choose, we better choose early and keep paddling to our chosen side of the river when we finally reach the passes.

This little image brings out a lot of how change occurs in our lives. First, it combines the three forces of change into one image. Second, it illustrates the power and the limitations of choice in shaping the future. Americans are short-term thinkers. We want change to happen right now. Unfortunately, most of the nearterm future is already determined by the forces at work in our organizations and society. The ingredients are already "baked in the cake," so to speak. Our greatest choice lies in the longterm future where we have a greater number of possibilities to choose from and more time to exert our limited resources to achieve the one we want. In the long run,

water erodes rock even though they are no match in the short run. Longterm commitment to a desired future will more often be successful than shortterm commitment to a series of desired futures.

An effective vision must be about the longterm future. It has no chance of being achieved rapidly. That is hard enough. But the harder part is to sustain the commitment to achieving it over the intervening period. We too soon forget our dreams, and groups are worse, pelted by different leaders, fads and fashions, changes in membership. As Stephen Covey says, "The urgent drives out the important." We are distracted from our goal. Visions, to be effective, must be far out and long term, but they must be practiced everyday.

Thinking about the Future

Just as there are three types of futures and three forces shaping the future, so there are also three ways of thinking about the future. The whole set is represented in Table 1.

The probable future, the one most people think about, is shaped by constants and trends. Those forces are analyzed through the standard techniques of science and history. "History repeats itself." The aphorism is partially true. It would be more accurate to say, "The future will be like the past, only different." We can find analogues to present conditions in historical periods. New technologies often follow predictable paths of innovation, acceptance and maturity. Political trends cycle back and forth like a pendulum. People see similarities between the transition from an agricultural to an industrial society and now to an information society.

TABLE 1

Futures	Forces	Thinking	Techniques
Probable	Constants Trends	Definite Scientific	Historical analogy Extrapolation
Possible	Discontinuities Surprises	Speculative Imaginative	Scenarios
Preferable	Choices Images	Visionary Empowered	Visioning Strategic planning

Mathematics and computer simulation provide more exact approaches to extrapolate current trends and predict the probable future. Adjusting the parameters in the mathematical models, one can also create some alternative futures. Those alternatives appear in a rather narrow range, however, and do not provide any genuinely new material. They are usually more or less of the same elements from the probable future. Most of the professionals who devote themselves to studying the future (economists, demographers, market researchers, planners) use these techniques to understand the probable future and closely related alternative futures.

To get really different futures, one has to engage the other side of the brain (to use the wellworn metaphor). Imagination is the source of truly novel alternative futures, but the use of imagination is not promoted in many aspects of society. Artists, designers and inventors are praised for their imagination, but us regular folks who work in regular organizations are not expected to use our imagination. In fact, we are actively discouraged because it makes life tougher on the boss and the organization. They don't like having to deal with all those "troublemakers" making up all that crazy stuff instead of "doing their jobs." As a result, imagination gets a bad rap. "Real forecasters don't use imagination. We just stick to the facts."

Sticking to the facts is a sure method for missing a lot of the future and most of the interesting and important stuff. Mathematics is great for generating new views of old data, but the new view was always contained in the old data. Nothing really new comes out. For novelty, one must draw on the creativity inherent in human thought, the ability to think of things in entirely new ways, to imagine eras with completely new rules and relationships. Right away there is the objection, "But how do you know these things will happen?" And right away there is the answer, "You don't, but something brandnew will happen in the future. (It always has.) So we believe that thinking about new things is better than not, even though the exact things we are thinking about may not really happen."

Peter C. Bishop is chairman of the Graduate Program in Studies of the Future at the University of Houston at Clear Lake.

Chairperson's Corner

continued from page 1

might not be easy. There are some wonderful articles in those old issues. One of the best I found was: "The Dawn of the Third Millennium" by James C.H. Anderson in Issue Number 8 (June 1988). And there are some other fascinating articles by actuaries who understand and enjoy applying fu turist techniques. I wish there were more.

But there was still a lot I wanted to know. For example, I wondered who the actuaries are who choose to belong to the Futurism Section and what they hope to get out of it. My impression had been that Futurism Section mem bers were mostly those in more senior positions, those who need to get the "big picture." I expected to find actu aries whose work involves planning and projecting for long periods and who had risen above the level where the basic models employed in actuarial science are a complete solution.

Much later, the SOA staff provided me with a listing of the Section mem bers, so

(continued on page 6, column 1)

Chairperson's Corner

continued from page 5

I could substitute some facts for my impressions. Like any good actuary, I was delighted with the pros pect of a 60 page computer printout full of data that I could spend some time analyzing. I was able to resist the temptation to waste a great deal of time on it, however, and confined myself to a 20% sample (every fifth page). What I found was close to what I had ex pected more than 75% of the members are Fellows, and there is some tendency for them to have been Fellows for a longer time. Compared to the numbers in each class shown in the table "Fel lows by Year: 1949 1996" on page 230 of the 1997 Yearbook, only 82% of the "expected" number of those who became Fellows in the 1990s are members of the Section, 104% from the 1980s, 107% from the 1970s, and 111% from the 1960s.

I also looked at titles, although I don't have any "expected" data to com pare them to. For what it's worth, 32% of our members are consultants, 11% are vice presidents of corpora tions, an additional 8% are senior or executive vice presidents, and 6% are presidents or chairmen of the board. That includes a few who are presidents of small one person corporations, but the majority are presidents of large cor porations with very recognizable names.

I also looked at where our members live. About 19% live in Canada and a surprising 13% live outside North America. Compared to the "expected" percentages, computed from the table "Analysis of Membership Canadian and U.S. Members" on page 226 of the 1997 Yearbook, we have 16% more than expected from Canada, and 44% more than expected from outside the continent.

That doesn't really dispose of my question of who we are, but at least it deals with it. The more difficult part of the question is: "What do we do?" As I mentioned, I got part of my answer by looking at old copies of Actuarial Futures, and I got part of it by review ing our study notes. (My file had a copy of "Introduction to Futurism for Actuaries," by Dale Griffin and Barry Halpern. I now also have a copy of the excellent new proposed note "Applied Futurism," by Alan Mills and Peter Bishop.) I also looked at sessions that have been reported at recent actuarial meetings.

"What we do" also turns out to be a two part question. The answer to the first part, what futurists do, is that they apply various techniques, many (but not all) of them nonquantitative, to the pre diction of possible outcomes for human systems. The more interesting part of the question is what the Futurism Sec tion Council (and through it the Section) does. I was able to identify three things:

- Monitor the media to determine what futurist techniques and meth ods might be useful to actuaries
- Educate actuaries about those tech - niques and how and when they might apply
- Identify practical ways in which futurist techniques have been used in the past, and identify ways in which they might be useful in the future for practical actuarial problem solving.

To these ends the Section has brought some of the world's best known futurists to actuarial meetings. To mention just two, Peter Bishop spoke at both 1997 SOA Spring Meetings, and Joseph Coates spoke at the Annual Meeting in Washington last October. Jim Dator, head of the Hawaii Research Center for Futures Studies, will be speaking at the 1998 Spring Meetings in Hawaii. The council will be planning other sessions appropriate for future meetings.

Where we definitely need to do more is in the last point above. A cou ple of months ago an offer was made to pay $100 each to the first five descrip tions of applications of futurist tech niques to actuarial problems. Believe it or not, the money has not all been claimed. Write me, phone me, fax me, e mail me, whatever. The offer is still good. Your description of the applica tion can be as short as a sentence or two. Easy money!

Albert E. Easton, FSA, is a consulting actuary at Milliman & Robertson, Inc., in Albany, New York, and Chairperson of the Futurism Section Council.

The Actuary as Futurist

continued from page 5

(also an actuary) who is a member of the corporate strategic team.

So What Have I Been Doing?

As with any new job, it takes some time to get up to speed. Initially, I have no staff other than my assistant, but I can make use of researchers and good thinkers from within the company and hire consultants as needed. To enlarge the company's future thinking, I have also formed a futures team from within the company that shares information both electronically and in meetings. A futures Web site is also now available on our Intranet.

I have done a great deal of reading and I have attended a weeklong scenario-building class sponsored by the Global Business Network. I have worked with our training department to incorporate futurism into our programs where appropriate. One of these programs is called "Dimensions of Leadership," which all new officers take. I lead a discussion on futurism with attendees and provide exercises for them to apply futures thinking.

I am working on two scenario projects for Corporate: the future of electronic commerce in 2005 and the characteristics of work and the workforce in 2017. In addition, I am helping a business unit determine how its markets might change in the future.

I quickly learned that to do scenarios or thinking about the future, you need good information about trends and driving forces. This requires a great deal of reading and analysis and is too much for one person. Rather than build staff to do this environmental scanning, we have decided to make use of the various organizations that specialize in this and then

spend our time relating this information to its effects on The Principal.

The Future of Futurism at The Principal

I have been pleasantly surprised at the openness of people toward futures thinking. Of course, it doesn't hurt that the millennium is just around the corner. You can hardly pick up a magazine or watch a news show without some story on the future being addressed and this will only increase over the next couple of years.

Ultimately, for futurism to become an integral part of strategic planning and thinking within The Principal, it must be proven that the company can develop better strategies and be better prepared for future threats and opportunities. But because of the long-term aspects of futurism, success can be very difficult to measure. So far, business units and their people seem willing to incorporate futures activities in their daily operation. At least we are off to a good start.

Transition from Actuary to Futurist

From a personal standpoint, the transition from actuary to futurist has been an interesting and exciting one. In many ways, futurism expands on the work of the actuary by taking a holistic view of the world. Social, political, economic, environmental, and technology trends are used along with the usual actuarial assumptions such as demographics and interest rate trends when looking at the various ways that the future may develop. Both qualitative and quantitative methods are used. I look forward to the opportunity to add to the tools that The Principal can use in understanding the future.

Robert G. Utter, FSA, is Second Vice President and Futurist at The Principal Financial Group in Des Moines, Iowa and an immediate past member of the Futurism Section Council.

Actuarial Assumptions and the Future

by W. Harold Phillips

ABSTRACT

The contributions of the actuarial profession to our employers, the industries we serve, and the public are hampered by a misunderstanding of what an actuary does. In many cases actuaries have fostered the myth that actuaries can and do predict the future.

Consensus is required within the profession so that we can reach out and better explain to others what we do.

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Thesis

The future is unknown and unknowable. To try to predict it or estimate it is a very hazardous endeavor indeed. But what does this have to do with actuarial science?

The actuary cannot and should not attempt to estimate or predict the future. This would reduce actuarial work to guessing.

What then are actuarial assumptions? Actuarial assumptions are a representation of past or current experience in the parameters that affect a financial security system or the model it represents. Actuarial assumptions cannot and should not be used to estimate the future.

An actuarial model gives us a peek into how the future might be based on the actuarial assumptions that go into the calculations. This model does not predict or estimate the future. It merely shows the results of calculations based on the assumptions that go into the calculations.

An actuarial model depicts the future based on the actuarial assumptions used.

What then is the relationship of an actuarial model to the future? An answer is "none." What is the likelihood (probability) of the future turning out as depicted? Close to zero. So then can't a model predict the future? No! The future depicted is what it would look like if all the assumptions were fulfilled.

So what is the value of an actuarial model? It shows what the future might be like if all the assumptions were fulfilled. As many futures can be "predicted" as sets of assumptions are used in the models.

Doesn't a model estimate the future? Can't the actuary estimate the assumptions for the future? Can't the actuary give it his or her best estimate? What special powers of prescience does the actuary have? None, really. Does the actuary do probability distributions on each assumption? Unlikely. How do you measure the highest likelihood? Think of the difficulties in the one item of interest alone.

Charles L Trowbridge has an interesting section: "The Uncertain Future," page 67 of the *Fundamental Concepts of Actuarial Science*, 1989, and we quote:

> "Actuarial assumptions often, though not invariably, relate to a long span of time, not infrequently 50 or more years. The ability of humans to predict even shortrange future events is severely limited, and forecasting ability diminishes rapidly as the time span lengthens. Predictions are often based on 'extrapolation' or 'the continuance of present trends,' but neither can be expected to hold up for very long. The actuary is particularly aware that he has no crystal ball, and than any prediction that he might venture will invariable prove to be wrong, in one direction or the other. He can be expected to resist the idea that the assumptions he uses are predictions, though the public often understands them as such.
>
> "If an actuarial assumption is not a prediction, then it may be better described as an estimate. Is it then the actuary's 'best estimate' (presumably based on his interpretation of all the pertinent data he can find)? A best estimate implies that the estimator picks

(continued on page 8, column 1)

Actuarial Assumptions

continued from page 7

the mean, median, or mode of his personal probability distribution. This view of an actuarial assumption may suit some actuaries, but others will find it deficient."

The author would fit into the camp that finds the estimate concept most deficient.

To the prohibition of estimates and predictions, I would add forecasts and projections. Dictionary definitions might be helpful here:

- Forecast 1: To estimate, predict or seek to predict
- Forecast 2: To serve as a prediction or prophesy of
- Forecast 3: To calculate in advance.

Comment: This third definition may come close to what actuaries do.

- Projection 1: A prediction or advance estimate based on known data or observations
- Projection 2: Extrapolation
  - Extrapolate 1: To estimate or infer (a value, quantity beyond the know range) on the basis of certain variables within the known range.
  - Extrapolate 2: To arrive at (conclusions or results) by hypothesizing from known facts or observations.
  - Extrapolate 3: To speculate about consequences on the basis of (known facts or observations).

The actuary does not and should not do any of these, with the possible exception of the third forecast, "to calculate in advance."

If the actuary does none of these, what then is done? Is it possible that we have a semantics problem because we have been using words that do not quite describe what we do? After writing down many options, I found that the best was "application of actuarial assumptions into the future."

Thus an actuary does not and should not estimate, predict or project into the future. The actuary calculates using assumptions.

What is the danger of actuaries giving the impression that we do estimating or predicting of the future and others picking up on this and assuming that we do? If this is what we do, shouldn't we be judged by how well we do it? How many of us would like to be judged in our actuarial competency by how close the future comes to what our actuarial model have shown? Not many, I'm sure. That would be most unfair. Yet if we let others believe that's what we do, can we expect anything less? What then should we be judged on? Definitely not on how close the future matches the assumptions.

Who then makes the assumptions? In many cases, the actuary is in the best position to set the assumptions. In other cases, for example, interest rates, it may fall to others such as economists or investment specialists. In some cases state law or regulations prescribe the assumptions. At other times, the IRS prescribes the assumptions to protect the revenue base. In all cases the actuary should be willing to show and discuss the assumptions used in the model. If they are challenged, the actuary usually should be prepared to run the model with other assumptions.

This discussion makes a case for the separation of the construction and the operation of the model and the assumptions that are used in the running of the model. Does all this then diminish the value of actuarial models and actuarial work? Not at all! What then is the value and purpose? Even though we cannot predict or foresee the future, we can do a great deal to prepare for it. Actuarial models that depict the future can help us in dealing with, coping with and preparing for the future. They can familiarize us with what the future may have in store. They can be helpful to us in making currently required decisions in a way to maximize return or minimize loss.

Examples Where the Above Principles Have Been Violated with Resulting Difficulties

1. ***Illustrations.*** Despite the fine print that states that illustrations are neither estimates, predictions or most likely numbers, the public does not seem to grasp this concept. Paying less than illustrated and/or premiums not vanishing as illustrated, has gotten the industry into quite a bit of trouble. Agents have not helped. "Our company has always paid more than illustrated" may have been true from 1942 through 1980 but not since then. "But the agent promised that's what I would get" does not help the disappointment when people have been relying on the illustration for retirement planning.

I submit that the illustration problem is related to the points made above. The perception exists that somehow the actuary, the consummate professional, is estimating or predicting what will happen by use of the illustration. If that's not what such an expert is doing, what is being done? That's the heart of the problem. The actuary has not explained what is being done. Companies using the illustrations prepared by the actuary have just passed them onto their prospects.

What is being done, of course, is that current assumptions are being used for the future for all the durations shown. No estimation, prediction, projection, or extrapolation. Are the numbers accurate? Yes, to the last decimal place. They are based on current assumptions, showing what the future would be like if these current assumptions held into the future. This is a mighty big "if." The future is unknown and unknowable, and what will actually happen is virtually certain not to be what is in the illustration.

A clearer understanding by all of what an actuary does and what actuarial assumptions mean can help us out of the illustration pitfalls. The new model illustrations regulation solves some of the problems, but the basic issue of disappointment when less is paid than illustrated remains.

2. ***Actuarial Standards of Practice*** (ASOP No. 17 Expert Testimony)

- 2.1 defines actuarial assumption as the value of a parameter or other actuarial choice, having an impact on an estimate of future cost or other actuarial item under consideration.
- 2.3 defines actuarial method as a procedure by which data are analyzed and utilized for the purpose of estimating a future cost or other actuarial item.

Comment: I would change the word "estimate" to " calculation." The use of the word "estimate" is contrary to the

thesis of this paper and can only get us into trouble.

- 6.5 states: "Inherent Uncertainty of Results. Actuarial forecasts or projections have a degree of uncertainty because they are based on the probability of occurrence of future contingent events. One of the most important duties of an actuarial expert witness is to convey the inherent uncertainty of actuarial estimates or fore casts."

Comment: The reason for the inherent uncertainty of results is that the future is unknown and unknowable. The future cannot be predicted. The actuarial model depicts the future based on the assumptions used. The future as it unfolds will be different from the assumptions. The difference in the numbers of the model and the future as it unfolds will depend on how the actual experience differs from the assumptions. We need to get out of the mode of predicting or even trying to predict the future. It will only get us into trouble. See below also.

- 6.6 states: "When confronted with an attempt to characterize an actuarial opinion as nothing more than a guess, the actuary should counter such a characterization, and not allow the concept of uncertainty to be used to discredit the validity of actuarial work and testimony."

Comment: Depiction of the results of an actuarial model as an estimate is tantamount to admitting that it is but a guess. A better approach would be to explain what an actuary does by using actuarial assumptions as described above under "thesis."

ASOP No. 10 deals with Methods and Assumptions for GAAP Financial Statements.

- 5.4 states: "Best estimate assumptions reflect the most likely outcome."

Comment: Assumptions and estimates are two terms that are in conflict. An actuary does not and should not use estimates in actuarial models. Actuarial assumptions are used, but they are not estimates. A most likely outcome? That is virtually impossible. Does an actuary do a probability distribution for each assumption? No. How many options are considered and chosen from to pick the most likely? For an actuary to set down the most likely course of interest rates is beyond his or her capability. Accounting rules seem to be requiring the actuary to do what he or she is incapable of doing, is not trained to do, and should not be doing because of the folly of even attempting it. This is based on the myth that actuaries do or attempt to predict the future. Based on the thesis of this paper, nothing could be further from the truth.

- 5.5.2 states: "Assumptions that included provisions for the risk of adverse deviations should bear a reasonable relationship to best estimate assumptions."

Comment: All comments above apply.

Conclusion

It is important to understand what an actuary does and how he or she uses actuarial assumptions. The actuary is not in the business of predicting or estimating. The more we can get the public away from this perception, the better off we'll be.

The purpose of this paper is to stimulate discussion within the profession and hopefully move toward consensus. If we can reach such a consensus, we can then reach out to others and better explain what we do and how we go about doing it. A great opportunity exists here. We should remove any myths that exist so that our contribution can be better understood and be made more effective.

I am indebted to the writings of Frank M. Reddington (especially "Nescience and Prescience"). Thoughts I had on this subject were greatly stimulated when I came upon his writings. A collection of his writings is in the SOA library, "A Ramble Through the Actuarial Countryside," 1986, Staple Inn, Institute of Actuaries Student's Society.

W. Harold Phillips, FSA, is Senior Life Actuary at the California Department of Insurance in Los Angeles, California.

Council member (left to right) Bob Utter, Al Easton, Tom Hughes, and Larry Miller take a break from planning the future of the Futurism Section at the Annual Meeting in Washington, D.C. in October.

Minutes of the Futurism Section Council Conference Call

September 17, 1997

Participating: Al Easton (new council member), Kathleen Elder, Tom Hughes (Chair), Paul Laporte, Larry Miller, Alan Mills, Peter Neuwirth, Paul Stefansson (new council member), Bob Utter, Lois Chinnock (SOA staff).

Absent: Kermitt Cox, Gary Brantz (has resigned from the Council).

Review Of 1997-1998 SOA Meeting Plans

a. Alan and Tom reported on the Palm Springs and Montreal Spring Meetings. Dr. Peter Bishop led two sessions at each meeting: "Futurism 101" and "Applied Futurism." Alan reported that the "Futurism 101" session in Palm Springs was filled to capacity. Tom reported that 20 people attended the "Applied Futurism" session in Montreal, which looked at the future for the actuarial profession.
b. The SOA Annual Meeting was held October 2729 in Washington, D.C. The Futurism Section was to have a halfday session called "Living Futurism." Joe Coates was the presenter. Breakfast and a brief Section meeting were to be included.
c. Both 1998 SOA Spring meetings will be held in Hawaii. We are planning one session at each meeting. Bob Utter is working with Jim Dator, Head of the Hawaii Research Center for Futures Studies, to create an interesting program. Final wording for the session was due November 5.
d. Larry Miller will be the Futurism Section representative for the 1998 SOA Annual Meeting. Bob Utter will work with him to come up with a seminar within the meeting.

Newsletter Status

Alan Mills reported that the newsletter was about ready to go. He was waiting for two electronic copies of articles to finish the newsletter. It takes about 30 days to publish once the newsletter is ready.

Other Iniatives

a. *Study Note:* Alan reported that the note is finished and it has been sent to Jeff Allen for educational review.
b. *Futurism Home Page:* Kermitt leads this project but was not on the conference call. Bob Utter reported that the committee was refining the structure of the Web site and should have some thing to present at the meeting in Washington, D.C. Debbie Jay at the SOA is available to put up the Web site.
c. *Liaisons with Other Groups:* Tom received a letter from Richard Cumpston, Convenor, Committee on the Future, Institute of Actuaries of Australia. Mr. Cumpston was requesting closer cooperation in several areas: exchange of papers, meeting records and a possible joint sponsorship of a seminar titled "Models of the Future" in 1999. Tom replied positively to Mr. Cumpston and indicated he would follow up with a phone call. Mr. Cumpston included a copy of a paper he is presenting titled "Models of the World for the Next 100 years." Tom was to send a copy to each council member.
d. *SOA Working Group for Course 7* (Modeling): Tom is representing the Section on this group, and Alan is helping.
e. *Project to Solicit Research Projects:* Peter leads this effort and reported that a notice was included in the Education and Research newsletter, *Expanding Horizons*, but there had not been any responses to date.
f. *Project to Solicit Practical Futurism Applications To Actuarial Work:* Tom discussed his proposed announcement. He plans to use this as an insert in *The Actuary* with responses being directed to him.
g. *Contact with Futurism Groups to Identify Futurism Applications to Actuarial Issues:* Paul Laporte will contact the Futures Group to see if they have anything they can share. Bob Utter will do the same for Global Business Network, Institute for the Future, and Northeast Consulting.

Treasurer's Report

The current balance is $10,115, but we needed to pay $5,000 for the speaker at the SOA Annual Meeting along with postage and printing costs.

Next Meeting

Our next meeting was to be a luncheon at the SOA Annual Meeting in Washington, D.C. on Monday, October 27 from noon to 1:30 pm. Lois was to send out a RSVP form. The main topic was to be election of officers and appointment of committee heads.

The meeting adjourned at 2:55 p.m. CDT.

Respectfully Submitted,
Robert Utter
Futurism Section Council

Futurist Quiz

by Peter C. Bishop

This test is on your assumptions about the future. Assumptions are never completely right or wrong although some may be better than others under certain circumstances. The assumptions that futurists use help them anticipate the complex and sometimes surprising futures that await us. If you choose to use those same assumptions, you will be better prepared for those surprises as well.

✉ ✉ ✉

Please check your best guestimate to the following questions. (Answers with a discussion of each can be found on page 13).

1. Can we know the future of health care?
____ a. Yes
____ b. No

2. Are there one or many futures of health care?
____ a. One
____ b. Many

3. What is the longest that we can usefully forecast?
____ a. 12 years
____ b. 35 years
____ c. 510 years
____ d. 1025 years
____ e. More than 25 years

4. Which is better for understanding the longterm future?
____ a. Single, clear predictions
____ b. Multiple possible futures
____ c. Neither
____ d. Both

5. Which is the most important characteristic for a good forecast?
____ a. Accuracy
____ b. Precision
____ c. Utility
____ d. Clarity

6. Is the future of health care already determined?
____ a. Yes
____ b. No

7. Which influences the longterm future of health care the most?
____ a. Trends
____ b. Events
____ c. Choices
____ d. All influence the future equally

8. Which type of future is most useful?
____ a. The most probable future
____ b. Possible futures other than the most probable
____ c. The future we prefer
____ d. All are equally useful

9. Which influences the longterm future the most?
____ a. Demographics
____ b. Physical environment
____ c. Technology
____ d. Economics
____ e. Government
____ f. Culture
____ g. All influence the future equally

10. Which is the most serious cause of forecasting errors?
____ a. Lack of information
____ b. The forecaster's assumptions
____ c. External events

11. Which attitude toward the future is most often correct?
____ a. Optimism
____ b. Pessimism
____ c. Transformationalism
____ d. Fatalism
____ e. All are equally correct

12. Telling stories about possible but unlikely futures is useful.
____ a. True
____ b. False

13. Who sets the vision for the organization?
____ a. The leader
____ b. The top management
____ c. The strategic planning team
____ d. Managers in general
____ e. Everyone
____ f. None of the above

14. Which are the three most important characteristics of an effective strategic plan?
____ a. Commitment to carry it out
____ b. Coverage of everything the organization does
____ c. General direction for fundamental change
____ d. Detailed implementation plans
____ e. Understanding by everyone
____ f. Valid planning methodology

15. Which is the most frequently overlooked characteristic of successful change?
____ a. Communication
____ b. Trust
____ c. Vision
____ d. Commitment

Peter C. Bishop is chairman of the Graduate Program Studies of the Future, at the University of HoustonClear Lake in Houston, Texas.

Book Review

Foundations of Futures Studies: Human Sciences for a New Era

Vol 1: History, Purposes, and Knowledge, (Wendell Bell) Transaction Publishers, New Brunswick, NJ, 1996, 365

The preface to *The Foundations of Futures Studies* by Wendell Bell is dated 31 August 1995, the last day of the last academic year of his 43-year career. That date speaks to the significance of the book in his career and in the field of futures studies. The book is his legacy, a gift really, to his friends and colleagues in futures studies and to those who want to learn about the field.

A sociologist by training, Wendell Bell chose to practice his trade as a futurist, a social scientist of future phenomena, if you will. Wendell's real interest was the development of the field as an example of the sociology of knowledge. What can we know about the future? How can we use that knowledge for good?

The first of this twovolume work addresses the first question. Its scope is from Bertrand de Jouvenel's *The Art of Conjecture* [1], and it has the same solid feel of common sense and clear reasoning. It could be "The Art of Conjecture II: What We Have Learned Since 1967." Bell, the careful and reasonable observer, describes it all, including an outstanding 37page bibliography. The book is like reading through Bell's orderly and thorough file cabinets, a summary of 30 years of an intellectual movement.

The purpose is primarily summation, first recounting the history of the field (as well as anyone has done) and addressing its perennial issues: The issues include the name of the field (an old war horse, to be sure), its purposes, assumptions, and methods, each getting a chapter of its own. This is familiar ground to professional futurists, but no one has collected it all in as complete or as useful a form until now. This book is a milestone in the development of the futures field.

Amidst the summary material, Bell also stakes out his own position on a few of the old chestnuts. What shall the field be called? He believes that "futurist" has already won the day, but the name of the field is still open. He opts for "futures studies, futures field or futures research" over its rivals (p. 70).

What shall we call statements about the future? He bucks the mainstream on this one and argues strongly that prediction is "a statement or assertion about how the future might turn out to be." (p. 98, italics added) He admits that a long list of futurists, including Marien, Masini, Jantsch, Slaughter, D. Bell and others, argue for making a distinction between predictions of certainty (what the future *will be*) versus forecasts of plausibility (what the future *might be*). Though Bell can define his terms however he wishes, his position is highly unusual, and it does little to put this question to rest.

His argument is that we rely on prediction everyday. Science uses prediction as the way to falsify hypotheses and control natural processes. Why not join the crowd and call our work what it is—predicting? He readily admits that "predictions may be multiple, conditional, contingent, corrigible, uncertain ..."—everything that forecasts are supposed to be (p. 107). What he really wants to do is to redefine "prediction" generally and get the other forecasters to think of their assertions the way futurists do.

That is a noble goal, but one that I believe is ultimately futile. The cost of pursuing that goal is to do away with the distinction between prediction and forecast. Futurists distinguish themselves from other forecasters, such as demographers, economists, and market researchers, by emphasizing the contingent nature of their forecasts and the relatively absolute nature of the others. Accepting Bell's definition would prevent futurists from making that all important distinction. So the debate goes on, but I do not see Bell's position prevailing.

Bell comes down on another perennial worry bead—Is Futures Studies an Art or a Science? (Chapter 4). His argument comes from his convincing 1987 article of the same name [2]. He argues that futures studies is very much a science because it looks outward on the world rather than inward on subjective experience. He admits that the practice of any profession can be called an "art form" as a metaphor because all practitioners make use of subjective experience in forming judgments. Nevertheless scientists strive to depict the world as it is; artists as they see it. Artists may even distort their representations to communicate their experience more fully. Futures is about the world more than about how our experience of it.

This book does an even greater service by introducing people to the epistemology of critical realism as the framework for knowledge of the future. Critical realism hews a nice middle course between positivism, the philosophy of science that prevailed in the first half of the century, and postpositivism (or postmodernism), the reaction to positivism's deficiencies. Critical realism sides with positivism in agreeing that truthful knowledge of an objective world is possible. It sides with postmodernism in agreeing that the knowledge is fallible and, therefore, we can never know when our knowledge is true and certain [3]:

> "The difference is between one of certain knowledge versus reasonable beliefs. Critical realists do not demand that the truth of the proposition be justified, only that a person is justified in believing the proposition is true. This, of course, allows for the possibility that conjectural knowledge is false. When that happens, however, critical realists say that what they believed was wrong, not that they were wrong to believe it. (paraphrased from p. 210).
>
> "Critical realists ... believe that, even if a proposition cannot be justified as being true, the belief in the truth of a proposition can be justified as being reasonable. From this perspective there is little philosophical difference in justifying beliefs in assertions about past and present realities on the one hand and beliefs in assertions about the future on the other" (p. 221).

The notion of critical realism has many implications for the practice of futures studies, many of which Bell recounts. Work in the field proceeds in a "culture of critical discourse" [4] in which futurists continually attempt to falsify assertions about the future. In an evolutionary fashion, those assertions that survive become the truths of that era. De Jouvenel called it an "ecology of ideas," and modern evolutionists speak about the survival of memes (units of ideas) just like the survival of genes. In this conception, futures studies is no different from any scientific field or other community of discourse.

Unlike these points, however, most of the book is uncontroversial. Some of the sections tend it be "listy"— nine purposes, nine assumptions, 13 methods. He describes each one adequately in itself but does not discuss its relation to the others. On the purposes, for instance, Bell could distinguish between the knowledge (forecasting) and the action (planning) sides of the field. On the methods, those that are more qualitative from those more quantitative. Revealing the internal structure of these lists would make the exposition more meaningful and memorable.

In sum, the book is an ambitious attempt to capture what we know about the study of the futureBell's version of Francis Bacon's Novum Organum. It will appeal to futurists as a benchmark in the development of their field although they will not find much new or controversial here. It will appeal to new students of the field as a careful delineation of its basic framework although it may go too deeply into epistemological matters for novices. One book serving both audiences cannot satisfy them all, but this book comes very close.

Wendell Bell has watched the futures field grow from its infancy to a credible, though not yet completely accepted, intellectual practice. He carefully assembled what it did and what it learned over that period. Now he shares that with us as his gift of a lifetime. Thank you, Wendell, for your care and your thoughtfulness. In typical selffulfilling fashion, its richness will nurture the field you so proudly describe.

Peter C. Bishop is chairman of the Graduate ProgramStudies of the Future, at the University of HoustonClear Lake in Houston, Texas.

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2. Gouldner, Alvin. 1985. *Against Fragmentation: The Origins of Marxism and the Sociology of Intellectuals.* New York: Oxford University Press.

3. de Jouvenel, Bertrand. 1967. *The Art of Conjecture.* New York: Basic Books.

4. Musgrave, Alan. 1993. *Common Sense, Science and Scepticism.* Cambridge: Cambridge University Press.

FUTURIST QUIZ ANSWERS AND DISCUSSIONS

1. Can we know the future? — *a. Yes*

About 50% usually answer Yes; about 50% No. Your answer, of course, depends on how you define "know." If by "know" you mean that you can predict what will happen, then the answer is obviously No. Efforts to predict the exact future of human systems are so prone to error that they are futile. However, if by "know" you mean what *might* or *could* happen, then the answer is a qualified Yes. Futurists hold that we can know the majority of plausible futures, if we relax our assumptions and preconceptions of what is possible.

2. Are there one or many futures? — *b. Many*

Despite half of the respondents answering No to #1, most people say there are many futures. The future is plural, not singular—hence the term "futures." The multiplicity of the future is a blessing. While we can know many if not most of the plausible futures, we cannot tell exactly what will happen until it does (and even then we are often not sure what *is* happening). On the other hand, the multiplicity of futures gives us freedom to influence what the future will be. If the future were one, it would be completely determined and our influence would be either negligible or preordained (like being a character is Isaac Asimov's *Foundation Trilogy*).

3. What is the longest that we can usefully forecast? — *All are correct*

The answer depends on the subject of the forecast. Actuaries and futurists prefer the longterm (more than 10 years); politicians and investors must be prepared for radical change in the shortterm (next week!). Contrary to what most business people think, the future beyond five years (the standard business planning horizon) can be useful, particularly when longterm investments or decisions are involved. Individuals, and even companies, also have more influence in the longterm. Shortterm outcomes are already determined for the most part. Consistent effort toward a goal over long periods, however, can produce amazing results, even when one's power or influence at any one time is small. Rock holds water in the shortrun, but water erodes rock in the long.

4. Which is better for understanding the longterm future? — *b. Multiple possible futures*

Would that we could have single, clear predictions that are useful! The problem is that predictions give a false sense of certainty and precision. Multiple possible futures are the best we can do and are therefore better for understanding the future. Unfortunately, some if not most clients prefer single, clear predictions. Futurists

(continued on page 14, column 1)

Futurist Quiz Answers and Discussions

continued from page 13

believe that intelligent decisionmakers can understand that basing a decision on a single prediction is like "putting all their eggs in one basket" and that the real future is more uncertain than that. The purpose is not to be "right," but not to be surprised. If decision makers are prepared for the range of plausible futures, then they can be successful no matter what occurs as long as it occurs in that range.

5. Which is the most important characteristic for a good forecast? — *c. Utility*

Accuracy and precision are supposed to make the best forecasts, particularly quantitative ones. People even ask futurists how often they are correct—i.e., what their batting average is. The question indicates a misunderstanding of applied futurism. Longterm forecasts are more qualitative than quantitative because the longterm is defined as the period of time in which fundamental change is likely to occur. Forecasting precise quantities from one side of a fundamental change to another is nearly impossible. How accurate were fiveyear forecasts of the Russian GNP in 1988? The best longterm forecasts are not necessarily accurate or precise, but useful to decisionmakers. They point out the most likely future as one possibility in a range of alternative plausible futures. Useful forecasts can even be inaccurate, as when the forecast of impending doom promotes action that averts the doom.

6. Is the future already determined? — *b. No*

Most people say "No." A "No" answer, however, means that single predictions are almost always wrong. The problem is that most people learn about forecasting from wellbehaved mechanical systems rather than from complex human systems. We learned to predict where a pendulum would be, how much ice would melt, when a lunar eclipse would occur. Single, clear predictions are possible even essential there. Similar predictions are impossible, however, in the economic, social or political systems in which individuals acting with incomplete knowledge and free will have yet to exert their influence. Fortunately, the indeterminacy of the future also gives us the time and opportunity to exert our own influence.

7. Which influences the longterm future the most? — *d. All influence the future equally*

Good test taking recommends All as the answer, but it does point out how often people think otherwise. The three specific factors each represent a theory of how the future develops. Those who emphasize "Trends" believe that the future will be like the present only different in some measurable quantities. Those who select Events see a turbulent future, full of uncertainty and unpredictability. Those who emphasize Choice believe they and others control the future. In fact, each influences the future somewhat, but differently in different domains (trends in demographics, events and choices in politics for instance. The future is a combination of them all. Leaving out any one truncates the range of plausible futures.

8. Which type of future is most useful? — *d. All are equally useful*

All again is a good answer, but looking at the individual choices highlights what each is good for. The "Probable Future" is what most people believe a forecast should be. The "Probable Future" is usefulwhat will happen if nothing really surprising happens. It is about as useful as the expected value of probability distribution-the center of the distribution no doubt, but no one ever expects to the expected value to occur exactly. "Plausible Futures" are useful for indicating the variations around the "Probable Future." Listing all possible futures is impossible; sampling, however, is not. Possibilities that represent critical assumptions about the future prepare decisionmakers for a wider range of contingencies than the Probable Future alone. The Preferable Future is valuable both for forecasting (things preferred are more likely to occur) and for action (mobilizing action toward a consensus goal). Not articulating and working for our preferred futures is the same as being part of a deterministic future.

9. Which influences the longterm future the most? — *g. All influence the future equally*

Depends again on the domain. Some think some influences are more powerful than others. Americans generally see technology as more powerful than people from other cultures do. Rulers and politicians believe that government is in charge. Environmentalists believe that the physical environment will have the last word. Economists the economy, and so on. Futurists are careful to weigh all the influences appropriately and realize that in the longrun, all of these forces will have their impacts. Rather than specializing in any one field, futurists specialize in the interaction of all fields with each other.

10. Which is the most serious cause of forecasting errors? — *b. The forecaster's assumptions*

Most people respond that Assumptions are the most serious error, but significant numbers choose "Lack of Information" and "External Events" as well. It is easier to blame Information and events because we are not responsible for them. Our assumptions, on the other hand, are our own making. A reading of history shows that the most serious errors are the result of mistaken assumptions. Which shall we choose as an example? The patent official who forecast the decline in invention around the turn of the century? The physicist who said heavier than air flight was impossible? The office equipment executive who saw no need for more than six computers worldwide? The list goes on. Forecasters had all the information in front of them. Their interpretation of what the information meant caused the problem. It's not what we don't know that's the problem; it's what we think we know and don't.

11. Which attitude toward the future is most often correct? — *e. All are equally correct*

All are equally correct because the future is pluralthere are optimistic, pessimistic, transformational and fatalistic futures out there. The most often correct depends again on the domain and the time frame. Fatalism is more appropriate for the shortterm; transformationalism for the long. Personality also plays a role. Some people are natural optimists, some are pessimists. Level also plays an interesting role. People tend to be more optimistic about their individual future and more pessimistic about societal or global issues. (Perhaps the subtle hand of the media is at work.) The point is that all views need to be considered to get a full, well-rounded view of the real future.

12. Telling stories about possible but unlikely futures is useful. — *a. True*

You can't be a futurist without telling stories. Stories are the most ancient yet still the most effective way of getting a point across, even in our hyperscientific age. AI researchers say they will know when a computer is human when, in response to a query, it said, "Let me tell you a story ..." Stories capture the essence of the future without claiming to know the details. Storytellers abound in our societycomedians, politicians, leaders. A story about the future, called a scenario, can enliven a plausible future that the audience had never thought. The best response to a scenario is "Yes, you're right; that could happen ..." That person's future is now wider than before they heard the story. And, as a result, they are better prepared for the future that does become the present.

13. Who sets the vision for the organization? — *f. None of the above*

Most people answer "The Leader." A sizable group of people also say "Everyone." Both are correct. Vision is a tool of the futurist or leader who wants to create transformational change. A vision is that attractive future that motivates people to work beyond themselves (and beyond what they're getting paid for) and synchronizes their effort with those of others working for the same vision. It appears as though the leader sets the vision, but a more accurate view holds that the leader articulates the vision in everyone's heart. The leader is the spokesperson for the vision, but he or she can only know what to speak after listening to the visions of everyone involved.

14. Which are the three most important characteristics of an effective strategic plan? — *a. Commitment to carry it out; c. General direction for fundamental change; e. Understanding by everyone*

Strategic planning is the most often used and the most poorly practiced technique in the futurists toolkit. We have all had the experienceendless forms, pointless meetings, large threering binders stuffed with 1.1.1.1.1.1... The "plan" is supposed to contain everything the organization is going to do for the next five years. What it really contains is what everyone is currently doing, put there to protect their position. The best strategic plans are short. They set the direction, not every detail of carrying it out. Details more than a year out are impossible anyway. Everyone must understand the plan. Who can understand 350 pages of closely dense outlines? And everyone must be committed to it. Aha, there's the rub! The plan is approved, but serious disagreements remain. What happens to the implementation? Strategic planning is often so painful that the last thing people want to do is ever see the plan again, much less implement it. Direction, understanding, commitmentthose are the essentials. Leave the details to the annual plan.

15. Which is the most frequently overlooked characteristic of successful change? — *b. Trust*

Every one of us has one or two golden projects in our backgrounda group of people that worked together for a worthy goal and maybe even made a difference. A staff group, reflecting on the projects in their past, developed these four attributes of successful projects: Communication, Trust, Vision, Commitment . They are clearly all important, even necessary. The leadership of that same organization went through the same exercise and came up with exactly three of the characteristics. Which characteristic of a successful project did not occur to them? Trust. All are necessary, but trust is the most often overlooked.

Trust among project members reinforces the belief that everyone is working for the good the project, not using the project to advance themselves or their interests. Even more importantly, trust between managers and workers prevents the cynicism that often accompanies the announcement of significant change. People have been burned too many times before. Leaders have announced change; people have gotten on board; only later the leaders "change their minds." The goal is harder to achieve, more expensive, more timeconsuming than once thought. Trust is the organization's belief that their colleagues and their leaders will do what it takes to achieve the goal.

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No "right" answers, to be sure. Rather a host of common sense insights that can help us understand, anticipate and influence the future more effectively. Your Futurist IQ is the measure your ability to (1) conceive alternative plausible futures, (2) understand the implications of those futures for yourself and others, and (3) begin to work with others to increase the chances of your preferable future occurring.

For more information about the emerging field of futures studies, contact the graduate program in Studies of the Future at the University of HoustonClear Lake (2812833396 or *www.cl.uh.edu/futureweb/*).

END NOTE

1. Peter Bernstein (*Against the Gods: The Remarkable Story of Risk*: p. 203) recounts a story from Kenneth Arrow who was a weather forecaster in WWII. Arrow and his colleagues discovered that their 30day forecasts were random and bore no relation to the actual weather on the forecast days. They recommended to the general that they discontinue the work and do something more valuable. His reply was to continue because he needed the forecasts "for planning purposes."

Futurism Bibliography

The SOA library houses many works on futurism-related topics. Below is a listing of offerings available. For more information, please contact Ellen Bull (*ebull@soa.org*) or Sara O'Connor (*soconnor@soa.org*) in the SOA library.

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