

INTRODUCTION
TO
THE FUTURES RESEARCH METHODOLOGY SERIES

by
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INTRODUCTION

This paper introduces a series of papers on futures methodology. These papers give an executive overview of each method's history, description, primary and alternative usages, strengths and weaknesses, use in combination with other methods, and speculation about future usage. These papers also contains appendixes with applications and sources for further information. Over half of these booklets were written by the inventor of the method or by a significant contributor to its evolution.

These papers are designed to:

1. Provide UNDP/African Futures with basic information on futures methods, which can be used by National Long-Term Prospective Studies (NLTPS) teams in African countries to develop their national plans;
2. Provide the Millennium Project Feasibility Study with a sufficiently detailed review of futures methods on which methodological recommendations for the full Project can be based;
3. Generate feedback on the feasibility, desirability, and strategy for periodic state-of-the-art reviews of futures methodology and, if determined to be desirable and feasible, serve as the initial focus for the Millennium Project's periodic reviews of futures methodology; and
4. Be a resource for futures educators and trainers.

The intention was not to be exhaustive in the selection and treatment of futures methods, but to address the above purposes cost/effectively. Initially, African Futures Project of the UNDP requested consideration of only 13 methods. Subsequently, the feasibility study steering committee recommended additional methods and groupings of methods; hence, this series was enlarged to 18 papers. Suggestions on improvements of these papers are welcomed and encouraged in anticipation of future editions of the series.

I WHY FUTURES METHODOLOGY?

The forces of nature, social and political dynamics, scientific discovery, and technological innovation largely determine the future. However, human choice increasingly shapes the future. Had the United States *not* agreed that France could go back to Indochina after World War II, the Vietnam War would not have happened and hence, we would not have experienced all the war's resulting influences on world affairs today. The pace of technological and medical advancement was changed by President Kennedy's vision of landing a man on the Moon. A sequence of technologies were invented to accomplish this goal, for example: communications satellites, computers, and new materials: all of which have changed the human condition. Society cannot completely control the future, but it can influence the course of history. This influence makes the effort to consider the balance between what we want and what is possible worthwhile.

The purpose of futures methodology is to systematically explore, create, and test both possible and desirable future visions. Future visions can help generate long-term policies, strategies, and plans, which help bring desired and likely future circumstances in closer alignment.

Asking people to cooperate in building a better tomorrow is not reasonable without a shared, multi-faceted, and compelling image of the future. How such images are created influences the quality of the future. For example, the early inhabitants of what is now Switzerland held traveling conversations among the various ethnic groups to reach a multi-faceted and multi-language state that has become synonymous with peaceful cooperation. Because many different kinds of people were involved in the construction the future vision, a cross-section of interests were represented, unrealistic views were modified.¹ When people are not involved in the creative process, the absence of their views can lead to future problems. For example, indigenous Americans and African slaves were not part of the visioning team that created what became known as *Manifest Destiny* - the future vision of westward migration in the United States to create wealth. These two groups are still not well integrated into the affluent American society today.

Positive visions, untested by futures analysis, can be destructive by leading people toward impossible goals or impossible schedules. For example, during the mid-20th century, many Africans believed that once decolonization was complete, peace and plenty were sure to follow - quickly. This positive vision proved unattainable. Forecasting studies might have identified factors that could frustrate the dream, thus illuminating policies, moderating expectations, and preventing the dashed hopes and cynicism that poisons the imagination of the next generation who might otherwise have built a better Africa.²

If no general agreement exists about an organization's or nation's future direction, then how can one know what is useful or useless? To what end would one cooperate? be efficient? Although, the application of futures methods to generate future visions will not eliminate conflict or competition, a people can have a shared future vision of economic competition toward a common

goal. For example, corporations competed to get government contracts to help land a man on the moon. This competition gave coherence to research and development and created the greatest synergy in history between research in biology and physics. The lack of vision promotes aimlessness and apathy, which in term erodes the human resource base and increases waste of all kinds. Intelligent visions provide the backdrop or criteria for deciding what is more likely to be useful or useless in the future.

The increasing complexity and acceleration of change decreases the lead-time for decisions and makes previous expectations less reliable. Forecasting increases lead-time between potential events and current planning. Hence, the faster pace and complexity of change today increases the value of early warning, because it increases time-space for analysis to create more intelligent decisions.

Another reason to use a range of futures methods today is that the understanding of time is changing. In the Agricultural Age, the perception of time tended to be cyclical. An important use of forecasting was to predict when each part of the cycle would recur, i.e., when will the rainy season begin, or when will the Nile flood? In the Industrial Age, the perception of time tended to be more progressive and linear. An important use of forecasting was to predict how technology will become more efficient. In the Information Age, the perception of time is more open. Hence, the contemporary focus on forecasting to determine what is possible and desirable, which is a far more complex task, requiring a range of methods.

Perhaps the most commonly understood reason for the use of futures methods is to help identify what you don't know, but need to know, to make more intelligent decisions. For example, one might write a scenario to see how a particular future might occur. In the process of writing, it becomes clear that no easy transition from the present to the future exists for some developments. This difficulty focuses the mind on the important questions to resolve in order to design better policy. It forces us to think about the future and helps identify assumptions to examine and change, if necessary. If our mental models of how the world works are incorrect, our forecasts will also be wrong regardless of technique.

An advertisement for the World Future Society is a succinct overview of reasons for thinking about the future:

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- To Succeed in Your Career
 - To Prepare for Change
 - To Choose Your Future
 - To Make Better Decisions
 - To Help Your Children, and Grandchildren, etc.
 - To Prevent Disasters
 - To Seize Opportunities
 - To Understand Today's World
 - To Develop Self-Confidence
 - To Expand Your Horizons

II WHAT IS FUTURE STUDIES AND RESEARCH ?

To study the future is to study potential change - not simply fads, but what is likely to make a systemic or fundamental difference over the next 10 to 25 years or more. Studying the future is not simply economic projections or sociological analysis or technological forecasting, but a multi-disciplinary examination of change in all major areas of life to find the interacting dynamics that are creating the next age.

As historians are supposed to tell us what happened and journalists tell us what is happening, futurists tell us what could happen and help us to think about what we might want to become. Futurists do not know what will happen. They do **not** claim prophesy. But they do claim to know more about a range of possible and desirable futures and how these futures might evolve. Methods of futures research do not produce completely accurate or complete descriptions of the future, but they do help show what is possible, illuminate policy choices, identify and evaluate alternative actions, and, at least to some degree, avoid pitfalls and grasp the opportunities of the future.

The purpose of future studies is not to know the future but to make better decisions today. The papers on futures methods display a powerful set of methodologies to help us understand the range of possible future worlds. Many of these methods are used in planning and policy activities by private corporations, non-governmental organizations, universities, governments, and international organizations.

Futurists have not reached consensus on the name or definition of their activity.³ Some prefer the term "futures research" and by that mean the use of methods to identify systematically the consequences of policy options and to identify alternative futures with policy implications for decision makers. Others prefer the term "future studies" and by that mean any exploration of what might happen and what we might want to become. Still others, ostensibly in Europe, and Francophone Africa prefer "prospective studies"⁴ and by that mean the study of the future to develop a strategic attitude of the mind with a long-range view of creating a desirable future.⁵

Futures research is not a science; it does not have controlled experiments like physics and chemistry. Nor is it yet universally recognized academically as an established field for doctoral research. Few universities offer graduate futures degrees.⁶ However, countless doctoral dissertations have used the methods discussed in this series and concepts pioneered by futurists.

We have always known it is smart to think ahead. But futurists do this as a profession, on a larger scale, and have methods and a body of writings to think systematically through the possibilities of tomorrow. One day, futures research may become an organized body of assumptions and methods with a more formal academic tradition; in the meantime, it can be thought of as an art in that it is creative and/or as a craft in that it applies knowledge with skill.

But unlike other crafts and arts, futures research and studies utilizes information from all of the sciences. The empirical base of the "futures field of knowledge," writes reviewer Pentti Malaska, "is all sciences, whereas the empirical base of anyone science is only that science's domain. A value of futures research is not discovering new factual knowledge as the sciences, but producing perceptions and insights to that body of knowledge."⁷

To study the future, futurists scan the media to keep abreast of what is new that could indicate fundamental or systemic change. They also keep track of key individuals who are reliable sources of information about change in specific areas, make change themselves, and often have new ideas and insight into the processes of change. Futurists also apply a number of methods to explore the viability of current trends and, perhaps more important, future developments that could deflect those trends.

Futures research should be judged by its ability to help decision makers make policy now, rather than whether a forecast was right or wrong. Futurists can make a forecast that is intended to be proven wrong. For example, forecasts about the long-range economic impacts of the full Strategic Defense Initiative or "Star Wars" for both the United States and the former Soviet Union turned out to be wrong. Policymakers in the former Soviet Union and later in the United States realized that it was too expensive to complete. Hence, the forecast was wrong but useful to change policy. Conversely, forecasts can be made to become self-fulfilling. R. Buckminster Fuller forecasted that "doing more with less" through *design science* will create synergies in technology which will make the world efficient enough so to feed, clothe, and shelter itself.

In summary, if we do not know the consequences of our choices, our freedom to choose is an illusion. Hence, no freedom exists without forecasting, as was well argued by Bertrand de Jouvenel in the *Art of Conjecture*.

The appendix to this paper contains an annotated bibliography by Michael Marien drawn from his publication *Future Survey*. Reading these annotations will provide an excellent overview of future studies methodology and related issues.

III FUTURES RESEARCH FOR POLICY vs ACADEMIC FUTURE STUDIES

Futures research, when used to help improve decision making, is quite different than academic research in future studies. The following discussion is a fresh approach to this distinction and terminology.⁸

Futures research is decision-oriented, i.e., it seeks to identify and describe current forces that should be understood in order to make more intelligent decisions. For example, a decision maker might want to know what are the most likely changes in genetic engineering and biotechnology that could affect agricultural exports over the next ten years. In addition to forecasting the technological possibilities, the futurist might include market behavior and possible reactions of other countries to determine the range of plausible futures that could affect export sales.

In contrast, future studies are subject- or question-oriented, e.g., what are the critical technologies that will have the greatest influence over the next 25 years? A range of technologies would be identified and forecasted and their impacts assessed against a set of assumptions. The purpose of such an exercise is to explore all possibilities fully so that others can find specific insights to their needs. Future studies can also contribute to a specific field of study and/or body of information.⁹

The series of methods papers that this paper introduces serves both orientations. This challenge gives basic information for NLTPS teams assisted by UNDP/African Futures to decide what methods they want to use, as well as to assist decisions on methodological selection and combinations of futures methods for the Millennium Project Feasibility Study's final report. It is also academically-oriented - and, to some degree, basic research-oriented since it will provide UNDP/African Futures with basic references as well as serve as the methodological base-line for future methodological state-of-the-art reviews and function as resources for futures educators and trainers. As a result, some explanations may be too long for decision makers and too short for academic standards.

Futures research tends to create a broad set of issues and questions to address policy problems and to seek insight from an extraordinarily diverse section of sources using a broad set of methods. This breadth runs the risk of the researcher being superficial. Academic future studies tend to go much deeper into questions and, therefore, can become narrow and/or parochial in their result.

When conducting futures research for policymakers, the futurist must continually ask the question "What difference does it make?" rather than "How well do you know it?" This is the core distinction. The complete economic, technological, cultural, etc. backgrounds that *might* be relevant to a policy decision are not possible to know in a short period of time, but the most critical factors

are possible to know very quickly. Futures methods make that possible. Often leaders have to make policy decisions quickly and do not have time to wait for results from a more complete study. They do *not* have to understand the subject, they just have to understand what to do and why. But if academic researchers are not thorough, who will be? Academic research has the responsibility to understand the issues as completely as possible. This responsibility means that pragmatic or applied futures research relies on judgment from more basic academic futures research. Applied futures research consumes the more broadly and rigorously processed basic future studies.

And lastly, futures research often does its own "public opinion research" by direct contacts, anecdotal information, and empathetic introspection. Decision makers may well cross-examine the futurist in person; researchers will want their conclusions based on firsthand experience as much as possible. Herman Kahn preferred to fly over regions to see for himself and interview local taxi cab drivers to augment more conventional information sources.

IV WAYS OF ORGANIZING METHODS

Futurists distinguish normative forecasting from exploratory forecasting. Normative work is based on norms or values. Hence, normative forecasting addresses the question: what future do we want. Exploratory forecasting explores what is possible regardless of what is desirable. This general division of futures work into normative and exploratory can be misleading when applied to methodology. Many techniques can be used for both normative and exploratory forecasting. Some tend to be used more for one than the other. Futurists "tools" are often quite flexible and adaptable to specific purposes.

Normative uses of futures methods answer the questions: what is the desirable future; what do we want to become? Exploratory uses of futures methods answer the question: what are the possible futures - whether they are desirable or not?

No agreement exists on the proper way to organize futures methods,¹⁰ although enough experience has accumulated that this should be possible. In the meantime, the organization of futures methods is an area for further research, and one that the Millennium Project should pursue.

Techniques can also be used "for" or "with" the client. Futurists can do their work largely independent of those for whom the forecast is done. They can receive the requirements for a study and return the results. The other methodological tradition involves the client, community, nation, or for whomever the study is done. The assumption of such participatory approaches is that client involvement in their own future is essential for understanding and acting on the results of the study.

The methods in this series could be classified in the following way:

Method:	BY TECHNIQUE		BY PURPOSE	
	Quantitative	Qualitative	Normative	Exploratory
Environmental Scanning	X	X	X	X
Cross Impact Analysis	X	X	X	X
Decision Analysis	X		X	
Decision Models	X			X
Delphi		X	X	X
Econometrics	X		X	X
Futures Wheel		X	X	X
Gaming and Simulation	X	X	X	X
Genius Forecasting		X	X	X
Morphological Analysis		X	X	
Participatory Methods		X	X	
Relevance Trees		X	X	
Scenarios	X	X	X	X
Statistical Modelling				X
System Dynamics	X			X
Structural Analysis		X		X
Technology Sequence Analysis		X	X	X
Time Series Forecasts	X			X
Trend Impact Analysis	X	X		X

A Simple Taxonomy of Futures Research Methods ¹¹

V. RELATED ISSUES

A variety of related issues should be considered part of the introduction to future studies and methodology. If subsequent editions of this series occurs, then the list of related issues could be more inclusive and organized. For the purpose of introducing the current series, only a few are needed to illustrate the kind of issues should be considered when developing futures research teams and applications.

Prediction vs Forecast

A prediction is a statement that you believe will be true. "I predict there will be more futurist activity in 1999 than at any point in history." A forecast is a probabilistic statement that does not imply that you believe the forecasted event will occur. "The weather forecast for tomorrow is a 50 percent chance of rain." As noted previously, futures research should be judged by its ability to help decision makers make policy now, rather than by the forecast being right or wrong. Many of the forecasts of the Limits to Growth study were wrong but were useful to stimulate better environmental planning.

Planners vs Futurists

Planners tend to look at change in one particular phenomenon or subject area (e.g., urban or educational planning). Futurists tend to look at change in a variety of areas and are more multi-disciplinary. Planners' time horizon tends to be shorter than futurists' - 3 to 5 years compared with 25 or more years for futurists. Futurists' output can be or should be input to improve planners' work.

Futurists can give planners long-term opportunities to include in their planning and long-term problems to avoid. Futurists can give alternative futures, and decision makers can select one; then the planner can create plans to achieve that future. However, this process is not static. As new information and intelligence is identified by the futurist, forecasts should be changed and communicated to the decision maker and planner.

Reliability of Data

Only in the last generation have global standards in data been possible. The National Air and Space Administration of the United States (NASA is coordinating the Mission to Planet Earth that is standardizing global environmental data; UNU's Food and Nutrition Program has standardized global

data and computerized systems for data on food consumption and production used by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). Many other examples exist. However, the data's sources and reliability must always be examined.

Sometimes it is necessary to invent data to complete a futures exercise. Unfortunately, invented data can be passed on to others as if they resulted from actual research. Responsible futurists cite data that is invented in such a way to prevent this problem, e.g. different colors or fonts on charts, asterisk and footnotes, or clearly stating so in text.

Futures Research and Culture

If you believe that the future is pre-determined by God, then the only way to know what will happen is to know God's plan. Many believe this and see futures research as being irrelevant. But one purpose of futures research is to identify a range of possibilities to help us make better decisions. How many different solutions are there to the traffic problems in Cairo? One, two, five? Futures methods can help us forecast alternative futures for the traffic situation in Cairo but does not tell us what will happen.

Some believe the universe to be a dynamic self-creating God with humans as part of the process; hence, human activity in futures research has value. Futurists from many cultures believe that there are many possible futures, policies do make a difference, and the future is shaped through action or inaction. Since possible futures depend on what we do, participatory processes are critical.

Others believe these futures also depend on chance and on the consequences of developments that initially seem unimportant and unconnected yet later through tenuous interlinkages become dominant in their effects. Chaos theory holds that slight variations in initial conditions can make enormous changes unbeknownst to the observer. Related to the research on chaos are theories of complexity and emergence that help us see patterns and principals of change form one condition to another.

Plan "for" the Future vs Plan or Invent the Future

Plan "for" the future carries a different assumption about the nature of the future and humanity's role in it than the assumptions behind the phrase: plan or invent the future. Including "for" implies that the future is predetermined and all you can do about it is get ready. One plans "for" the annual flood of the Nile. However, if one believes the future can be shaped or influenced by human action, then one plans or invents that future.

Utility and Pitfalls of Analogy as a Short Cut

If two conditions are similar in some ways, one reasons by analogy that they are probably similar in others ways. In future studies, analogy applies to the dynamics of events in the past to help predict the future. Using analogy to short-cut more analytic methods is tempting. Sometimes, this is the most cost/effective way to proceed, other times, it is folly. How to know which is which? Ted Gordon gives the example of forecasting how color television will spread by reviewing how black-and-white television spread:

Suppose we had to forecast the market for color television and planned to use the spread of black-and-white television as a basis for the analogy. Viewed quantitatively, we would consider the price differences between the two and assess the percentage of families that might be excluded from the market because of the higher price. We might also estimate the rate at which current black-and-white sets would wear out and, from this, the rate at which buying opportunities would arise in the future. From a qualitative standpoint, we might also consider whether the sizzle offered by color TV would create two TV set owners and the effect this would have on the diffusion of the new technology.

Then to make the forecast, we would begin with the old curve depicting the sales of black-and-white TVs and adjust that curve, sliver by sliver, to account for the new situation (e.g., price differences, existence of a working black-and-white set, etc.).

This example is more quantitative and rigorous than the way it is usually used. For example, in the 1960s it was argued that the United States was experiencing degeneration similar to Rome before its decline; therefore, the United States will soon fall from world prominence. Or just as the embryo naturally devours its environment before birth, the human species will naturally deplete its environment before its birth into the solar system and galaxies. Analogies are fun to make and are often quite persuasive, but they may also have causal elements that are different, thus making the forecast wrong.

Accuracy vs Precision vs Utility

Accuracy and precision are separate concepts. Forecasts can be very precise, but quite inaccurate. Forecasts can be self-fulfilling or self-defeating. By forecasting the possible existence of a condition or technology, that condition or technology may become more likely. The mechanism is clear enough: others, reading about the possibility, work to bring it about. A forecast of famine may make the famine less likely if it triggers action. Thus, forecasting itself can have political implications. Furthermore, if a self-defeating forecast triggers action to avoid the forecasted problem, then the

forecast may have been highly inaccurate, nevertheless, the forecast may have been extremely useful.

Correlations and Lead Indicators

Marvin Cetron, President of Forecasting International, uses the ratio of the number of people in the bottom 10 percent income in a country compared with the top 10 percent income to forecast likelihood of political stability. Four years before the fall of the Shah, Iran's ratio was 38 to 1. At the same time, it was 10 to 1 in the United States, while 2.5 to 1 in Scandinavia. Today Mexico's is 40 to 1 (but beginning to fall after NAFTA). Graham Molitor, President of Public Policy Forecasting, uses socio-political policy change in Sweden to forecast future change in the United States. Leading Economic Indicators of the U.S. government are used to forecast economic activity six months into the future. The identification of leading indicators is a normal practice of any business and should be included in any long term prospective study.

VI. FRONTIERS

Adaptive agent modeling is a new and promising approach to simulation being explored by economists at the Brookings Institution, Washington, D.C., and the Santa Fe Institute, in New Mexico, U.S.A.

Imagine "populating" a screen at random with "agents" and "food." The agents behave according to simple and understandable rules. The agents can migrate, reproduce, eat, engage in commerce, accumulate wealth, and die. To eat, they must acquire food through harvesting or purchase. The market price is set according to well known rules of supply and demand. Once such rules are set, the agents are "turned loose" and their activities monitored as the markets form and prices fluctuate. The models produce surprising, unpredictable results: economic market theories sometimes do not hold; populations grow and wane in unexpected patterns; wealth is accumulated by some agents, and others become poor. In other words, simple rules lead to complex behavior that is unpredictable and yet seems quite realistic. By changing some of the rules slightly, the behavior of the emerging societies that populate the computer screen can be explored; perhaps more importantly, some of our assumptions about how markets work and how societies behave can be examined in detail.

This approach inverts the common approach to modeling in which real life-data is analyzed to produce equations that represent reality. In agent adaptive modeling, the rules are assumed first, and the results are validated by comparing the output with reality.

Although much of the future studies' methodology and ideas have been institutionalized, relatively little documentation, evaluation, and agreement exists about how methods are successful under various conditions and requirements. Futures research and studies have not built on their past in any

systematic fashion as have the hard sciences, medicine, and engineering. Although futures research and studies are not a science, they do have a body of assumptions that can be tested, edited, and made systematically available for critical evaluation to improve the quality of forecasting in general. Much of the necessary material exists, but in an unorganized fashion spread out through many entities around the world. This series is an initial contribution to the organization of such material for systematic feedback to improve the state of future studies.

One could make a large matrix with futures methods listed down the first column and repeated along the top row. Each cell would be completed by answering the question: how can the methods in the first column create new and improved uses of the methods listed in the top row of the matrix. A third dimension of the matrix could list new conditions or technologies, such as internationalization, virtual reality, computer communications, etc. Hence, one cell would pose the question: how could adaptive modeling be improved by Delphi in a tele-virtual reality environment?

Another frontier is the systematic interaction between normative and exploratory future studies. For example, the value of UNDP/African Futures will not be its predictions of African demographics and technology use, but its bringing together of descriptive futures research and normative participatory processes to make good policy change obvious to all.

Concurrent interest is growing in the future, instantaneous and global communications, powerful new nondeterministic modeling techniques, sharing information, systematic questioning software, data bases, and knowledge visualization. Now futurists, scholars, and others around the world can interact globally and take a fresh look at future possibilities, policies, and methodologies in ways not previously possible. This opportunity motivates many of those involved in the feasibility study of the Millennium Project.

APPENDIX

END NOTES:

1. Interview with Ambassador Raymond Probst in 1976 for Smithsonian Institution study by the author.
2. This positive vision was not rigorously compared with the realities of human and financial requirements to move into the industrial age. If normative (what we would like) AND exploratory (a more analytic description of what is possible or likely) futures studies were done together in the 1950s and 1960s, then a more **realistic** positive vision would have emerged. UNDP/African Futures is designed to encourage both approaches and their interaction.
3. Standards in methods and certification of forecasters does not exist. Although no single right way exists to do a Futures Wheel, Delphi, or Scenario, there are a reasonable range of "correct ways." These have not been documented and should be one of the assignments of the Millennium Project. Similarly, examples exist when forecasting methods were used intelligently and produced useful results, and times when they were not. This should also be documented as part of the methods evaluation of the Millennium Project. Eventually, we should be able to identify where standards are possible and what those standards should be. The remaining activity, which could well be the majority of activity, should be considered a craft (and hence skills to transfer and practice) or an art (and hence mediums to master).

In 1993, the European Community's Joint Research Center in collaboration with Conservatoire National des Arts et Metiers brought together about 25 futures research methodology experts but were not able to reach agreement on these issues. In 1994, participants in the Federal Forecasters Conference formed a task force to identify standards and certification requirements to make forecasting a job classification in the U.S. government.

Ted Gordon points out that erroneous forecasts can help improve methods and laments the absence of any repository for systematically made forecasts **S** right or wrong **S** so that future analysts can improve their methods by identifying the reasons for earlier failure. Certainly some serious evaluations forecasts have been made, but these are episodic rather than systematic as proposed by the full Millennium Project.

4. Berger, Gaston. "Sciences, Humaines, et Prevision," La Revue des Deux Mondes, 1957.
5. "Futurism" is not a useful or well-regarded term. If one consults the dictionary, one finds that futurism is an Italian school of art around the turn of the last century that robotized style. Surely, that is not what some futurists mean when they use the term "futurism." Secondly, "ism" implies an ideology like communism or Darwinism that say what is right and wrong and true and false. There is no truth or falsity about the future, just more or less likely or desirable possibilities. Futurists tend

to want to open our minds to new possibilities. "-isms" limit what is possible. Although some still use this term, this paper does not consider it appropriate. Peter Bishop would not exclude the term "futurism" as any more ideological than "futurist." He argues that it is a paradigmatic perspective on approaching the future just as Communism and Darwinism are paradigms in their respective fields. Then what would one call the study of alternative paradigmatic perspectives on the future of which "futurism" he states is one? It would have to be called "future studies" not "futurism."

6. Few university programs offer advanced degrees in futures research. Possibly the first in 1969 was the doctoral Program for the Study of the Futures in Education at the University of Massachusetts, but it closed in 1991. One can still get a doctor's degree of prospective and strategic studies at the Conservatoire National des Arts et Metiers in Paris.

Other more tightly focused doctoral programs are in Political Science at the University of Hawaii and in Systems Science at Portland State University in the United States. The Program for the Study of the Future at the University of Houston-Clearlake City, Texas, offers the largest Masters Science program in future studies.

Finland Futures Research Center at the University of Turku's School of Economics and Business Administration offers 20 weeks post-graduate studies in futures research for about 30 doctoral students for the past two years and is planning a professorship and a permanent doctoral studies program for Future Studies. Pentti Malaska, who runs this Finnish program and is President of the World Future Studies Federation, believes that India has the largest future studies program in universities and high schools in the world.

Prep 21, a project of the World Future Society, is identifying courses and programs on a global basis.

7. Malaska Pentti. *The Futures Field of Research*, Turku School of Economics and Business Administration. Series C-1: 1993.

8. The original motivation and idea for this discussion is drawn from Kahn, Herman, Card 1, *The Corporate Environment Study 1975-85*, Hudson Institute, October 1973. This card distinguished Policy Research from Academic Research.

9. Academic programs for the study of the future can also perform futures research contracts for specific applications, just as a futures research organization might perform some basic research. Prof. Peter Bishop notes academic work at universities can be both academic future studies (contribution to our overall understanding of an approach to the future and its methods) as well as applied futures research for a specific decisionmaker. This removes basic research from one particular occupation and also allows academics to do applied research (a particular time and place for a particular client). Understandably, future studies, as defined in this paper, is proportionately conducted more at universities than at any other kinds of organizations.

10. There are a variety of taxonomies. None of them are completely satisfactory. Michael Marien organizes methods in terms of seven "Ps": 1) Probable; 2) Possible; 3) Preferable; 4) Present (trends); 5) Past (retrospective); 6) Panoramic (systems); and 7) Participatory. This taxonomy is very instructive about the potential uses of methods, but most methods can be used in most of these categories. Another example is the Nordic Project of Future Studies. The taxonomy offered in this paper for methods also has some shortcomings. One can argue that even quantitative methods use qualitative assumptions, and a qualitative method can use numbers. By the same token, the normative/exploratory dimension refers to the purpose of the technique, which is not intrinsic to the technique itself.

11. Gordon, Theodore J. *Methods Frontiers and Integration*, Futures Research and Studies Methodology Series, produced by UNU Millennium Project Feasibility Study - Phase II and published by UNDP/African Futures, 1994.

ANNOTATED BIBLIOGRAPHY**FUTURES STUDIES METHODOLOGY**Selections from *Future Survey*

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This annotated bibliography offers a total of 81 items
in the following sub-categories:

- A. **General Background** (18 items)
- B. **Forecasting** (9 items)
- C. **Planning and Visioning** (15 items)
- D. **Scanning and Scenarios** (10 items)
- E. **Other Relevant Methods** (17 items)
- F. **Evaluation and Critiques** (12 items)

Six other bibliographies have been prepared to supplement the Phase II
Issue Booklets. They are:

- I. **Technological Capacity** (46 items)
- II. **International Economic Policy and Trade** (40 items)
- III. **Agriculture and Food Security Trends** (35 items)
- IV. **Global Life Support Systems** (36 items)
- V. **Population, Education and Human Welfare** (38 items)
- VI. **Peace, Governance, and Culture** (45 items)

All items in the bibliographies have been selected from recent monthly issues of *Future Survey* or from **Future Survey Annual**. To stay abreast of new books, reports, and articles on futures-relevant matters, subscriptions to *Future Survey* are available from the World Future Society, 7910 Woodmont Avenue,

Suite 450, Bethesda, MD 20814 USA. Many back issues of the monthly and all 13 volumes of the **Annual** are also available from WFS

A. General Background

Why Futures Studies? Eleonora Barbieri Masini (Prof of Social Forecasting, Gregorian U, Rome). London N4 1AD: Grey Seal Books (28 Burgoyne Rd), April 1993/144p/£20.00.

Former President of the World Futures Studies Federation asserts that Futures Studies in the 1950s and 1960s were extremely rich in ideas and activities. At the start of the 1970s, interest seemed to wane. But by the end of the 1970s and the early 1980s, there was a renewed impetus and interest, which is still continuing today. De-spite fluctuations and a situation of apparent fluidity in the last 30 years, "I believe that these studies can now be considered a discipline." Futures Studies respond to a need that is especially felt in our time of rapid and interrelated change. Future thinking forces us to think about the basic questions of life. It has three generally accepted principles: 1) there is a constant dilemma between knowledge, and desire and fear (between possibles and desirables); 2) the only space on which humans can have an impact is the future; 3) there is not one future, but many possible futures. Seven characteristics of futures studies are discussed: transdisciplinarity, complexity, globality, normativity, scientificity (the most-debated trait; many doubt that it belongs on this list because of no hard data), dynamicity, and participation (also questioned by some). Masini also discusses spatial and temporal dimensions, philosophical and ethical elements, limits (self-altering aspects, irrationality, lack of data on the past and present), terminology, futures projects in various world regions, objective and normative methods, scenario development, and systemic global models.

Concludes that Futures Studies "are a way of making people and societies identify and openly declare their objectives." Although first initiated in the industrialized countries, it is in the developing part of the world that this discipline will develop, in that the functions of clarification and criticism have been especially embraced by these countries. [NOTE: Excellent "starting-point" by a long-time leader; especially valuable for its brevity. There is a hint of the antique, though, with much citation of futurists from an earlier era (Bertrand de Jouvenel, Joseph Martino, John McHale, Erich Jantsch, Gaston Berger), and no futures thinking applied to futurism itself. It seems inaccurate (or, at best, premature) to call the enterprise a "discipline." Masini does not consider today's "who" of futures studies [see items #15 and 16 below]. By doing so, one can sense growth in numbers, but also a profound growth in incoherence.]

(futures studies introduction)

02

The Future of Futures Studies: a European View, Eleonora Barbieri Masini (Roma-Prati, Italy; past President, World Futures Studies Federation), *Futures*, 21:2, April 1989, 152-160.

In the mid-1970s/early 1980s, several important crises emerged that affected futures studies: the beginnings of challenging the validity of the welfare state, the growing and irreversible awareness in the developing countries of their rights, clear signs of failed development strategies, growing awareness by different groups of women in all parts of the world, a number of social movements emerging in different countries (ecological, pacifist, economic), and an aging population in the industrialized countries. This period of discontinuity produced awareness of the complexity and interconnectedness of events, and the sense that the future will not be a linear continuation of past and present. "As a consequence, the function of futures studies is increasingly becoming that of clarifying objectives, which in turn illuminate projections, forecasts and proposals." Global models have lost their appeal, and there is a growing movement toward futures studies that are local. In the US and Europe, futures studies will increasingly concentrate on management changes, new technologies, and aging societies. Futures studies issues will be very different in the developing countries, where pressing needs such as food production and distribution, and the availability of fresh water, will be crucial. As for methods, strategic planning will become more important in both the public and the private sectors.

(futures studies to clarify objectives)

03

Views on Futures Research Methodology, Roy Amara (Senior Research Fellow, Institute for the Future, Menlo Park CA), *Futures*, 23:6, July-Aug 1991, 645-649.

When modern futures research originated in the 1960s, a primary focus was methodological. In the eyes of many, futures research was synonymous with Delphi, cross-impact modelling, gaming, and simulation. These early methods have been refined, and in some instances superseded by more effective tools. Delphi is now far more seldom used since it has proved too expensive and blunt an instrument for many applications. For group processes, the generally preferred vehicle at IFF is the structured workshop. Cross-impact has been superseded by "softer" qualitative descriptions of interactions or by far simpler spreadsheet models. On a macro level, the dominant trend has been away from methodological formalisms and doctrinaire approaches that suggest silver bullet solutions. The principal objectives of futures research are to help inform perceptions, alternatives, and choices about the future by: 1) the art of the possible (laying out paths of probabilities); 2) the science of the probable (examining the likelihood of particular

paths); 3) the politics of the preferable (implementing particular paths). The tools of futures research can be improved significantly in the future by setting agendas (selecting what is most relevant), detecting structural changes, interleaving planning and implementing, and developing criteria for judging the quality of futures studies products. For the *possible*, the major quality criterion could be plausibility (general conformity with physical and behavioral principles, internal consistency). For the *probable*, the major criterion could be reproducibility. For the *preferable*, the criteria could be value explicitness and impact explicitness. But these criteria should not be applied in excessively rigid ways—as straitjackets rather than guidelines.

(trends in futures research)

04

Challenges to Planning and Strategy in the 1990s: Globalization and International Organization, Michael F. Oppenheimer (Executive VP, The Futures Group), *Vital Speeches of the Day*, 59:5, 15 Dec 1992, 130-134.

An address at the National Defense University on a seeming paradigm shift in international relations. Likely international conditions of the 1990s include a continuing crisis of economic growth, increased political and economic turbulence, a post-Cold War redirection of resources, a growing role for international organizations, and collectivization of crisis intervention. “Planners are now faced with a far wider range of plausible futures than they faced just ten years ago. An extremely wide-angle lens is now essential if we are to encompass within our view the range of possibility for which we must plan. Indeed, this range is so vast that many of our traditional analytical and forecasting techniques must be called into question.” Our enthusiasm for forecasting should be further tempered by the likelihood that we are only at the very beginning of unravelling the pervasive effects of 40 years of the Cold War. To forecast trends would require that we surround those forecasts with bands of uncertainty which would be almost infinite. Rather, the emerging world makes scenarios a more powerful tool. They can open our eyes to new possibilities, help us to structure monitoring and intelligence gathering, and help to sharpen and inform the policy debate.(need for scenario planning)

05

The Knowledge Base of Futures Studies (Special Issue). Edited by Richard A. Slaughter (Inst. of Education, U of Melbourne). *Futures*, 25:3, April 1993, 227-374.

Slaughter states that the knowledge base of futures studies is no more challenging, no less soundly based, than many other fields. “The futures field may or may not be a discipline in the narrow sense. What is incontrovertible is that it produces working knowledge and supports disciplined enquiry.” A viable model emerges from the layering of six core elements: 1) language, concepts, and metaphors (*alternatives, options, sustainability*); 2) theories, ideas, and images (*evolution, progress, chaos, wise culture*); 3) literature [a core of “about 200 key books” is mentioned but not explicated]; 4) organizations, networks, practitioners (*WFS, WFSF, Club of Rome*); 5) methodologies and tools (*scanning, scenarios, Delphi, models*); 6) social movements and innovations (*peace, women, environment*). Although the field may have fallen on hard times in some contexts, the times are ripe for a steady resurgence of futures work because it is important.

Seven long essays reinforce this view of core elements. **Sohail Inayatullah** describes three frames of reference (the predictive, the interpretive, the critical), poses basic images of the future (growth, collapse, reversion to past, transformation), and lists 20 metaphors of time (generational, lifecycle, leisure, lunar/solar, geological, cosmic, etc). **Martha J. Garrett** outlines the steps of the futures project (clarifying purpose, hiring a team, building networks, etc) and the futures study (gathering information, determining key variables, constructing scenarios, selecting strategies, etc). **Anthony J. N. Judge** recalls some of the cognitive functions of metaphor and applies them to the future as “what” (leaps, jumps, good times, Gaia), “where” (forwards, the future in children), “which” (choice between alternatives), “when” (linear progress, cycles), “who” (the future as the returning Christ or Anti-Christ, or as a leader such as Bill Clinton), “how” (chickens come home to roost, riding waves of change), and “why.” **Richard Slaughter** defines three core areas of activity in the futures field (futures research, futures studies, futures movements), and articulates 20 key concepts such as choices, sustainability, the metaproblem, cultural editing, re-negotiating meanings, the foresight principle, limits to growth). **Ian Miles** considers the tenuous relationship of science fiction to futures studies, finding much SF unable to cast light upon the present. **Hazel Henderson** points to citizen movements as social early warning systems that prefigure trends, noting that they have emerged as major actors leading the worldwide search for global ethics and survival-enhancing cultural DNA codes. **Rolf Homann** and **Peter H. Moll** survey the Western futures organizations (WFS, WFSF, Futuribles, and a few others), finding “a surprising lack of cooperation” and questioning the management of most.

Ten mini-essays on the futures studies knowledge base are also included. **W. Basil McDermott** points to the problems of generating new knowledge, such as revealing complexity and previously hidden problems. **Michel Godet** cautions against reducing anticipation to scenario building. **Yehezkel Dror** views most futures studies as a messy mix of superficial and fashionable normative preferences, along with predictive outlooks that lack deep grounding. **Eleonora Barbieri Masini** applauds the role of women in building alternative futures. **Samar Ihsan** asserts that empowering women ensures the success of democracy and the progress of society. **Magda Cordell McHale** cautions against cultural arrogance. **Allen Tough** urges more integrative and big picture thinking. **Igor Bestushev-Lada** considers how “barracks socialism” in Russia and elsewhere can be transformed from a pathological situation to a normal one. **Donald N. Michael** reminds us that futures studies are epistemologically groundless, and that they reflect a Western cultural bias. **Lester W. Milbrath** asserts that we have no other choice but to learn our way to a sustainable society.

Concludes with an annotated bibliography of selected non-US sources from Europe, India, South Asia, the Pacific Basin, and Britain. **(futures studies knowledge base)**

06

Futures Concepts and Powerful Ideas. Richard A. Slaughter (School of Education, U of Melbourne). Kew, Victoria 3101 Aust: Futures Study Centre (62 Disraeli St), Nov 1991/186p(8x12")/\$A40.00 (US\$45.00).

A “resource pack...for anyone wishing to understand or utilize some of the conceptual riches of the futures field.” Brief sections are devoted to such **Basic Concepts** as models of futures work (exploration, alternatives, options, choices), the futures field (encompassing futures research, future studies, and various futures movements), prediction vs. forecasts vs. foresight, past vs. present vs. future, Elise Boulding's “200 year present,” sustainability, and creativity. **Powerful Ideas** include critical futures study, aspects of the metaproblem (dominance of instrumental rationality, desacralization of nature, reductionism, powerful technologies linked with inadequate worldviews), cultural editing and the need to reconstruct our worldview, the transformative cycle of social and cultural change, renegotiated meanings, the foresight principle, time capsules, futures in education (“education for whole persons needs a futures dimension”), social learning and social innovations, new kinds of growth, human futures beyond earth, nanotechnology, maps of knowledge, the hierarchy of knowledge (ranging from data and information to knowledge and wisdom), why futures are essential, and an agenda for the 21st century (repairing the damage, creating sustainable economies, releasing human potential, creating institutions and processes of foresight, finding new purposes and meanings, and reinventing culture). About half of this “resource pack” is devoted to large-type summations of key points designed to be displayed using overhead projectors.

(futures resource pack)

07

Recovering the Future. Richard A. Slaughter (Centre for Applied Research on the Future, U of Melbourne). Clayton, Victoria, Australia: Monash U, Graduate School of Environmental Science, 1988/189p.

Collected essays representing “a series of explorations within the field of Critical Futures Study.” The future can no longer simply be assumed, and has become problematic. Although life has always been uncertain, our particular time is characterized by a breakdown and loss of certainty which is qualitatively different from previous historical experience, e.g. emergence of global problems, technology-led insults, and 5 billion people alive on planet Earth. The result is a collective loss of confidence and vision—an inability to see the future in any other than disastrous terms. If we cannot envision substantially improved future states of affairs, the present becomes that much harder to bear. It is only by “taking issue with the way things are” that we can begin to see how they could be different. By recovering our individual sense of the future, we might recreate what has for too long been missing from our public life: a quality of participating consciousness in space and time.

Specific topics include the ten central themes of futures study (alternative futures, possible/probable/preferable futures, the present as unique, the necessity of human control over change, etc.), the optimistic American mindset, reassessing the “standard view” of science, analyzing ideologies and interests in the futures literature, the transformative cycle as a tool for illuminating change, optimism and pessimism, technology and the future in children's media (whereby children learn to fear the future because it is represented to them in disruptive and incoherent ways), roots of the nuclear threat, empowerment and vision in the extended present, speculative fiction as being identified with a set of obsolete images and purposed (“post-galactic sf” could and should express a higher vision that is not subordinated to escapism), cultural reconstruction in the post-modern world, a rationale for futures in education, a model futures curriculum, and futures study in higher education. [NOTE: Wide-ranging and thoughtful.]

(Critical Futures Study)

08

Reclaiming the Future: A Manual on Futures Studies for African Planners. World Futures Studies Federation *et al.* Published for the United Nations Development Programme. London UK and Riverton NJ (PO Box C-166), Tycooly International, Dec 1986/197p/\$42.00pb.

A project of WFSF, Association Internationale Futuribles, and Association Mondiale de Prospective Sociale, involving 16 futurists of 12 nationalities (including 7 African nations) in preparing a manual to assist African planners to consider long-term trends and to choose desirable futures among possible ones. Chapters discuss Africa's need for futures studies (mainly by Mahdi Elmandjra), three views of African futures (by children, peasants, and politicians), futures studies concepts (mainly by Eleonora Masini), methodologies in futures studies (mainly by Sam Cole, who covers models, scenarios, surprises, etc.), scenario analysis (mainly by Ian Miles, who covers “recent” scenarios of the 1979-83 period such as the Interfutures project, Herman Kahn's “Next 200 Years,” the 1980 Lagos Plan of Action), and futures studies and policy making (mainly by Philip H. Bowers). [NOTE: Although aimed at African planners, this manual can be of some use to other planners. Regrettably, though, it suffers from a five-year lag in preparation and distribution: the latest citation is 1983, so the scenarios may be outdated.]

(futures studies for LDC planners)

09

Future Scan and Anticipatory Management. Satish C. Seth (Ministry of Science and Technology, New Delhi). New Delhi 110 001: Centre for Anticipatory Management (P.O. Box 3035), Jan 1989/72p(8x11")/Rs200; Rs160pb; \$US30.00.

A leading Indian futurist and author of **India: The Next 7000 Days** (New Delhi: Wiley Eastern, 1986) asserts that any intelligent understanding of India's future must take into account population growth (from 800 million in 1988 to over 1 billion by 2000), poverty (40% of the population living below a bare minimum), uneven development of different states, Indian value plurality, and technological plurality. Old ideas have exhausted their utility, and India must generate a new enthusiasm and a future-oriented culture by formally introducing teaching about Future in schools, colleges and universities. Chapters discuss Future and its alphabets (varying perceptions of time, cultural attitudes toward change, "strategic normative envisionment"), the spatial view of Future and allied considerations (command of resources, numbers, and needs, happiness scale) the ABC of Future Scan (all managers need to acquire a genuine concern to anticipate Future, for which they need a group of forecasters, programmers, and scanners), cybernetic management of rural futures (with marginal change and optimal change scenarios), rebuilding bureaucracy by training bureaucrats for the 21st century, the atomic age and the future of man (including an 11-item global threat inventory), the unfinished tasks of futures consciousness, a draft syllabus of futures studies to be introduced into the Indian higher education system, and the current status of futures studies in India. [NOTE: Much good material here, including a score of charts summarizing why we study Future, methods for future scanning, future threats and opportunities in Indian society, strategic planning and corporate goal setting, etc.]

(future studies in India)

10

From Anticipation to Action: A Handbook of Strategic Prospective. Michel Godet (Prof of Strategic Prospective, Conservatoire National des Arts et Métiers, Paris). Trans. by Clare Degenhardt. Foreword by Joseph F. Coates. Paris: UNESCO, n.d. (May 1993?) /277p/pb.

Author of **Scenarios and Strategic Management** (Butterworths, 1987) offers a manual of prospective strategy: "simple, operational tools for the conspirator of the future, which potentially means all of us." Chapters discuss schools of prospective (post-industrial, neo-Malthusian, long waves, bifurcation and chaos theory), schools of strategy (heuristic approach, the rationalists), principles of anticipation and prospective thinking (which have "nothing to do with the determinism of Futurology or Forecasting"), the scenarios method, structural analysis and the MICMAC method (a Gallic version of the cross-impact matrix developed by Godet in 1973), the MACTOR method (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations), reducing uncertainty by expert consensus methods, identifying and evaluating strategic options, integrating scenarios and strategy, devising a company plan and shared vision (and pitfalls in doing so, such as lack of real content, avoiding necessary structural change, etc.), and 11 likely trends: South-North and East-West migration, environmental threats, a lawless international environment, slow and irregular growth, energy price rises, the flood of new technologies, deregulation, global competition, rise of service industries, welfare state crisis, and a growing part of the population excluded from the job market. [NOTE: Strategic prospective handbook]

11

Futures Studies: A Tool-Box for Problem Solving. Michel Godet (Prof of Industrial Prospective, CNAM, Paris). Paris: UNESCO Bureau of Studies and Programming, "Future-Oriented Studies" Programme, June 1991/83p/US\$50.00 from GERPA Prospective, 26 rue Montmartre, 75001 Paris. (Also in French and Spanish.)

Provides a "tool-box" inventory of available methods, listed according to the type of problem under study: **1) asking the right questions:** scenarios, prospective workshops for groups who wish to think about possible and/or desirable changes [ALSO SEE: **Future Workshops** by Robert Jungk; **FS Annual 1988-89** #9544], structural analysis (MICMAC); **2) understanding the past and actors' strategies:** the MACTOR method to resolve conflicts between groups; **3) scanning the field of possible futures:** morphological analysis (Morphol), the Delphi method to identify convergence of opinions, the Regnier Abacus that provides a color decision scale for group opinion, the cross-impact matrix (SMIC); **4) evaluation and choice of strategic options:** relevance trees, and the Multipol method to take account of multiple criteria in decision-making. Advantages and limitations of each method are described. [NOTE: Literature scanning and associated learning, the essential method promulgated by FS, is not mentioned in this brief technical guide to *la prospective*. Software for MICMAC, Morphol, SMIC, and Multipol are available from GERPA at hefty prices ranging from \$1000 to \$1850.]

(ten futures studies methods)

12

Scenarios and Strategic Management. Michel Godet (Professor, Conservatoire National des Arts et Métiers, Paris). Preface by

H. Igor Ansoff. London and Stoneham MA: Butterworths, 1987/210p/\$59.95. (Originally published as **Prospective et Planification Stratégique**, by Economica Press, Paris, 1985.)

Both futures studies and strategic management are in favor today within most forward-thinking organizations, but these two complementary movements have grown in ways which were logically separate. This book seeks to show that there are powerful synergies between the two approaches, since all types of strategic planning and goal-setting presuppose a prior exploration of possible, probable, and desirable futures.

The frequent errors which occur in forecasting, and the noticeable absence of forecasts of crisis events, bear witness to the crisis within forecasting itself. Causes of errors include inaccurate data coupled with unstable models, lack of a global and qualitative approach, and explanation of the future in terms of the past. The future must be studied with a view to illuminating the present, which is the basic idea that inspires futures thinking, or *la prospective*. “*La prospective* is neither forecasting nor futurology, but a mode of thinking *for* action and *against* fatalism, which supplies a key to understanding and explaining crises. In a world characterized by uncertainty and by the risk of trends being disrupted, intellectual investment in undertaking *la prospective* is more necessary than ever.”

Chapters cover a critique of forecasting, pluralism and complementarity, the scenarios method, identifying key variables with the MICMAC method (Matrices d'Impacts Croisés, a Gallic version of the cross-impact matrix developed by Godet in 1973), analysis of past and future plans (showing why the first oil crisis was predictable), expert consensus methods to reduce uncertainty, the SMIC method (French acronym for Cross Impact Systems and Matrices), principal concepts of strategic management, internal auditing and external assessment, the choice of strategic options, reappraising strategic planning (“The main focus of planning is not the plan, but the process of reflection and concentration which leads to it”), the secrets of excellence (citing Peters and Waterman), and three methodological recommendations to avoid errors of diagnosis: 1) ask the right questions—do not hesitate to think against the grain; 2) the key to success in seeking excellence is as likely to be found in the human factor as in the technological and financial factors; 3) consider methodologies not as ends in themselves but as tools to stimulate thought and communications.

(la prospective as thinking for action)

13

Histoire des Futurs: les figures de l'avenir de Saint Augustin au XXI^e siècle. Bernard Cazes (Head, Long Term Planning Unit, Commissariat General du Plan, Paris). Editions Seghers, 1986/475p. (French language only).

The 20th century has spawned systematic investigations to penetrate the future and to guard against its uncertainties. But it did not invent the notion of rational anticipation and long-term projections of societal trends. A taxonomy of futures research is developed according to the purpose of the forecast (edifying to the reader or assisting in decision making), the nature of the postulated change (continuous vs. discontinuous), and the presence or absence of “progress” in the future under consideration. By using these categories, a limited number of patterns are perceived in projecting the future: social evolutionism, cyclical patterns, managed progress (the future as the result of directed human action), backward progress (discarding established patterns of civilization), and decadence (the future as increasingly worse than the present). While these categories of thinking still hold today, two new phenomena emerged after WWII: institutionalized futures thinking in both public and private sectors, and increasing professionalism in futures thinking. **(history of futures thinking)**

14

The Future: Trends into the Twenty-First Century. Edited by Joseph F. Coates and Jennifer Jarratt (Coates & Jarratt Inc, Washington). *THE ANNALS of The American Academy of Political and Social Science* (Sage Publications), Vol 522, July 1992/1-151/\$25.00;\$15.95pb.

A “showcase for professional futurists,” sampling topics that have received substantial attention from futurists, and demonstrating the richness of approaches in futures studies. In the initial essay, ***Exploring the Future: A 200-Year Record of Expanding Competence***, Coates and Jarratt provide their usual lists: 1) six streams of development in the study of the future (science/technology, military interests, business, sociology, history, and the literary tradition); 2) a typology of futurists according to audience (those who pursue a specialized interest in an organization, those creating a scholarly literature, those addressing the general public); 3) implicitly shared beliefs of futurists (there is no single future, we can identify alternative futures, we can influence the future and have a moral obligation to do so); 4) how to explore the future: identify key elements of the system being studied, identify forces driving toward change or maintaining stability, assess the force and direction of these trends, develop alternative futures that include preferable visions, consider low-probability “wild cards,” identify appropriate actions; 5) the benefits of a good futures study (reveals and tests assumptions, widens the scope of thinking about the future, enables interpretation of events and developments); 6) why forecasts fail (mechanical extrapolation of trends, unexamined assumptions, limited expertise, lack of imagination); 7) four global trends that will become more critical in the next two decades (status of women, international relations, population growth, impact of infotech); 8) four critical US issues in the next two decades (growing crisis in governance and leadership, declining quality of education, forces for a more diverse population, lack of a mechanism to define long-term collective objectives). [NOTE: To put this article in perspective, one must ask whether the boastful “200-Year Record of Expanding

Competence” has grown at a rate sufficient to match the expanding complexity of problems. We have assuredly grown more literate, yet functional literacy in the new era is decreasing.]

Two other essays in this issue also focus on methods. In *The Methods of Futures Research*, Theodore J. Gordon describes the Delphi technique, time series analysis, modeling, probabilistic techniques such as cross-impact analysis, and nonlinear techniques. In contrast, *The Good-Books Imperative: Keeping Up in Futures Studies*, by Michael Marien, extols reading as perhaps the most important (but often neglected) method, and recommends over 100 good current books in five categories: environmental issues and sustainability, global issues, US domestic issues, technology, and methods to shape the future. Other contributors include Pat Choate on US-Japanese trade, Vary T. Coates on infotech, Richard D. Lamm on the environment, Jan M. Grell and Gary Gappert on governance, Michel Godet on Eurooptimism, Ian Miles on the changing sexual division of labor, Christopher J. Dede on education, Walter A. Hahn on scenarios of aging America, and Jonathan Peck and Clement Bezold on [\(futuresstudies.org/view/sampler\)](#)

15

The Futures Research Directory: Individuals 1991-92. World Future Society (Patricia M. Johnson, editor). Bethesda MD: World Future Society, Jan 1991/248p/\$29.95pb (\$26.95 for WFS members; free with WFS Comprehensive Professional Membership).

A listing of 1,172 individuals involved in futures studies (broadly defined), updating the 1987 edition listing 773 individuals. Each entry provides the following points of information: address, day and evening phone number, date and place of birth, formal education, recent employment, major publications, professional activities, and specialization. Listees include such notables as Roy Amara, Samir Amin, Isaac Asimov, Frank Barnaby, Gerald Barney, Warren Bennis, Igor Bestushev-Lada, Lester Brown, Fritjof Capra, Marvin Cetron, Arthur C. Clarke, Herman Daly, John Diebold, Yehezkel Dror, Mahdi Elmandjra, Amitai Etzioni, Frank Feather, Ossip K. Flechtheim, Tom Forester, Andre Gunder Frank, Christopher Freeman, John Gardner, Martha J. Garrett, Kathryn Gillwald, Heitor Gurgulino de Souza, Peter G. Hall, Hazel Henderson, Ronald Higgins, Ivan Illich, Nandini Joshi, Robert Jungk, Ilona Kickbusch, Alexander King, Richard Lamm, Ervin Laszlo, Spyros Makridakis, Pentti Malaska, Ray Marshall, Eleonora Masini, Norman Myers, John Naisbitt, Marc Nerfin, Saburo Okita, Russell Peterson, Peter Raven, Ziauddin Sardar, James Gustave Speth, Paul Streeten, Milton Terris, Jan Tinbergen, Eric Trist, Roberto Vacca, Murray Weidenbaum, Michael Young, etc.

Geographical Index lists 361 non-US names (31% of the total), including 166 in Europe, 88 in Canada, 42 in Asia, 28 in Oceania, 20 in the Middle East and Africa, and 17 in Latin America and the Caribbean. The US listings are categorized by state; California, with 129 names (11% of total; 16% of US total), is far ahead of all others. *Women* account for 126 listings, 11% of the total. *Subject Index* groups listees under such general categories as aging, artificial intelligence, business, computers, creativity, development, education, environment, finance, global issues, human resources, impact assessment, issues management, long-range planning, peace and security, policy analysis, religion, sustainable futures, technology, trend analysis, urban issues, values, and women's issues.

[NOTE: The essential “Who's Who of futures studies,” with a new, concise format allowing more information in less space. The expanded number of listings over the 1987 edition *may* reflect some growth of futures thinking, but is probably largely due to a greater effort to gather hard-to-acquire information. There are still many noteworthy individuals not listed here—especially outside of North America—because they are still unknown to the compilers, they cannot be precisely located, or they are too busy to respond. Please send in names and addresses of omitted but deserving people who ought to be in the next edition of this important and unique directory.]

(1991-92 futurist directory)

16

The Futures Research Directory: Organizations and Periodicals 1993-94. Edited by Lane Jennings (WFS). Bethesda MD: World Future Society, June 1993/121p/\$55.00pb (\$39.50 for WFS members).

A companion to the Individuals directory (above), listing 187 organizations and 124 periodicals. Less than a third of the organizations and less than one-fifth of the periodicals were in WFS's last tally (**The Future: A Guide to Information Sources**; 1979).

Organization listings include all or most of the following: address, phone and fax numbers, key staff members, staff size and/or number of members, annual budget, year founded, major funding sources, goals and special interests, current projects, special facilities, periodicals published, and recent books and reports. Some sample entries: Australia's Commission for the Future, The Basque Institute for Futures Studies, The Brookings Institution (250 staff), California Futures, Carrying Capacity Network, Center for a Sustainable Future (Rome), The Chinese Society for Futures Studies (5,200 members), Club of Rome, The Conference Board (200 staff), Paolo Soleri's Cosanti Foundation (120 staff), Fritjof Capra's Elmwood Institute (1,400 members), The Heritage Foundation (145 staff), Institute for Futures Studies (Copenhagen), Institute for World Economics in Kiel (320 staff), International Food Futurists (Chicago), International Futures Library/Robert Jungk Foundation (Salzburg), MIT Macro-Engineering Research Group, MIT System Dynamics Group, New Zealand Futures Trust, OECD International Futures Programme, David Korten's People-Centered Development Forum, The Philippine Futuristics Society (163 members), Policy Studies Institute in London (55 staff), Polish Academy of Sciences Committee for Futures Studies, Pro Mundo (Buenos Aires), Russia's Open University Futures Research Center (Igor V. Bestushev-Lada, Director), Sustainability Ltd. in London (John Elkington, Director), Swiss Society for

Futures Research (630 members), Third World Forum in Dakar, the UNU in Tokyo, The Urban Institute in Washington (250 staff), US Congress Office of Technology Assessment (140 staff), World Business Academy, and World Game Institute in Philadelphia (32 staff).

Periodical listings include all or most of the following: address, editor, year founded, subscription rates, frequency, circulation, pages per issue, audience, and special concerns. Some examples: *American Demographics*, *Ecological Economics*, *The Ecologist*, *Ekistics*, *Future and Development* in China (20,000 bi-monthly circulation), *Future Generations Journal* in Malta, *Future of Korea and the World* (4,000 circulation), *In Context* (8,000 circulation), *Information for the Future* in Copenhagen (1,900 circulation), *Mutantia* in Buenos Aires (5,000 circulation), *New Perspectives Quarterly* (25,000 circulation), *OMNI* (900,000 circulation), *Pro Zukunft* (or *Pro Future*, the German-language *Future Survey* with 1,600 circulation), *Science and Technology in Japan*, *Social Alternatives* in Australia (4,000 circulation), MIT's *Technology Review* (93,000 circulation), and *Whole Earth Review* (25,000 circulation). [NOTE: An indispensable welcome to the wide world of general and specialized futures studies—much wider than perhaps anyone has imagined. And it is even wider if one considers the several hundred organizations and periodicals that did not respond to requests for information!] (futures organizations/periodicals)

17

On Alternative Ways of Studying the Future: International Institutions, An Annotated Bibliography and a Norwegian Case. Kjell Dahle (Head of Planning, Alternative Future Project, Oslo). Foreword by Johan Galtung. N-0182 Oslo 1: Prosjekt Alternativ Framtid (Hausmannsgate 27), April 1991/187p.

The Nordic Alternative Future Project arose at the end of the 1970s, and seeks to arouse the widest possible interest in the development of society according to alternative guidelines, through active democratic choice. The unique feature of the project is that it is state-funded, with the explicit aim of shaping value-based alternatives to current policies and societal arrangements. After a 30-page introduction to the Project, sketches are provided of 73 futures studies institutions such as Applied Futures in London, Centre for Our Common Future in Geneva, the Club of Rome, Australia's Commission for the Future, Environmental Liaison Centre International in Nairobi, the Soviet Foundation for Social Invention in Moscow, Futuribles International in Paris, the Gamma Institute in Montreal, Institute for Noetic Sciences in California, the International Futures Library in Salzburg, The New Economics Foundation in London, the Science Policy Research Unit (U of Sussex), the UNESCO Future-Oriented Studies Program, UNU in Tokyo, WFS, and WFSF. The second half of the book provides an annotated bibliography of nearly 300 items in future studies (about one-third of Scandinavian origin), in the following categories: introductions to futures studies, scenarios, utopian thought, processes of change, societal development, environment and resources, new economics, project evaluation, and periodicals.

(Nordic guide to futures studies)

18

Suomalainen Tulevaisuudentutkimus 1990 -luvella (Finnish Futures Research in the 1990s). Edited by Sirkka Heinonen (Senior Research Scientist, Technical Research Center of Finland, Espoo) and Iiris Hämäläinen (Secretary General, Finnish Society for Futures Studies). Helsinki 00101: VapK-Kustannus (Postimyynti PL 516) June 1992/222p.

A research directory describing over 200 Finnish projects (completed, ongoing, or planned). Titles are in Finnish and English; abstracts and keywords are in Finnish (a few are also in English). Introductory analysis, subject index, and researcher information (including address, phone, and fax) are in Finnish only. Some sample topics: climate models and scenarios, the role of lawyers in future society, alternative paths of rural development, educational system alternatives, information society and social policy, forecasting in chaotic systems, telecottages and distance work, pollution abatement and macroeconomics, the future of paper in the information society, new energy production methods and systems, reuse of industrial buildings, scenarios in strategic management, nature-oriented technology (by Pentti Malaska, Secretary-General of the World Futures Studies Federation), methodological development of futures research (by Mika Mannermaa), Espoo 2025 scenarios, sports scenarios in 2025, Northern Finland building construction in 2000, construction 2010, child 2012, health 2000, multidimensional health, and future of work. The directory is based on a future studies data base (FUTUROSkooppi or FUTUREScope) developed by Heinonen, the former Secretary-General of FSFS. [NOTE: Futures studies is quite active in Finland, in part due to the leadership of Pentti Malaska. The WFSF will hold its XIII World Conference in Turku, Finland, August 23-27, 1993.]

(Finnish futures)

B. Forecasting

Handbook of Futures Research. Edited by Jib Fowles (Chairman, Studies of the Future Program, U of Houston-Clear Lake City). Westport, CT: Greenwood Press, 1978/833p/\$39.95.

Seeks “to bring together significant state-of-the-art scholarship on the whole range of futures studies,” with 41 contributions in five parts: **1) The Growth of Futures Research:** essays by John McHale, Eleonora Masini, and Yujiro Hayashi; **2) The Difficulties of Futures Research:** Roy Amara on thinking about the future, Ida Hoos on the weaknesses of the data base, Ian Miles on the ideologies of futurists, Richard Henschel on self-altering predictions, Jib Fowles on the problem of values; **3) The Procedures of Futures Research:** Jay Mendell on intuition, Dennis Livingston on science fiction, Bettina J. Huber on images of the future, Ian Wilson on scenarios, Kim Quaile Hill on trend extrapolation, Harold A. Linstone on the Delphi technique, John G. Stover and Theodore J. Gordon on cross-impact analysis, Joseph P. Martino on technological forecasting, Joseph F. Coates on technology assessment, Denis F. Johnston on social indicators, Richard D. Duke on simulation gaming; **4) Substantive Areas for Futures Research:** Herman Kahn and William M. Brown on the optimistic outlook, Victor Ferkiss on the pessimistic outlook, Daniel Bell on the post-industrial economy, Hazel Henderson on the emerging counter-economy, Lester R. Brown on food prospects, and others on population growth, energy, cities, communications, technology, the political process, education, biomedical issues, and global futures; **5) The Challenges for Futures Research:** Olaf Helmer on research tasks, Frank Snowdon Hopkins on the planning mission, Willis W. Harman and Peter Schwartz hoping that futures research will become more utility-oriented, participative, holistic and normative. [NOTE: Still considered by some to be a classic. The index is poorly done and the appendices listing further information are very skimpy. And many major topics are ignored, including war and peace issues, economic issues, environmental issues, crime and justice, families and the individual, human rights, Third World development research handbook]

20

Methods in Futures Studies: Problems and Applications. Brita Schwartz (Swedish Research Institute for National Defense), Uno Svedin, and Björn Wittrock (both U of Stockholm). Boulder CO: Westview, Feb 1982/175p/\$16.00pb.

It is impossible to specify unique “solutions” to the methodological problems of futures studies, but some guidelines can be established. The usefulness and viability of any methods will depend crucially on the organizational and policy-making framework in which any project is embedded, as well as the objectives that the futures study is intended to serve. The authors summarize the dimensions of futures studies, and illustrate in detail the ways in which different methods have interacted in some real-world projects at the national level of policy-making in Sweden. Chapters consider characteristics and problems of futures studies, methods (Delphi, trend extrapolation, scenario writing, mathematical models), Swedish experiences in futures studies (regarding energy and society, resources and raw materials, and future transportation), problems and experiences (the role of futures studies, futures studies and decision-making, problem formulation and synthesis, criteria for scenarios and models, values), and the legitimacy of futures studies (intellectual, policy-related, and societal). [NOTE: An excellent, simply-written introduction to futures thinking broadly viewed.]

(futures studies introduction)

21

Forecasting: A New Agenda (Special 20th Anniversary Issue). Edited by Harold A. Linstone (Portland State U; Editor, *TF&SC*). *Technological Forecasting and Social Change*, 36:1-2, August 1989/224p.

Following Linstone's introduction (emphasizing three particularly promising areas of current activity: new insights on complex systems, multiple perspectives, and “what if” rather than predication as a basis for planning), 21 articles are assembled: **Joseph F. Coates** on 20 years of progress in forecasting and planning (regarding advance announcement of specific events, offering aids to decision-making, offering direction for action, and dealing with complexity); **Theodore J. Gordon** on growing respectability of thinking about the future and new tools of the trade (forecasting through judgment, modeling, and simulation); **Marvin Adelson** on the role of the futurist (influencing dialogue, dispelling misconceptions, interpreting present patterns, articulating aspirations and alternatives, reframing issues, enhancing risk appreciation); **Olaf Helmer** on needed directions for futures research (psychological laboratory research to improve efficacy of expert opinion-gathering, Delphi modifications such as computerized “D-nets,” an on-going systematic effort to identify low-probability events); **Roy Amara** on what has been learned about futures methods (“the clearest winner in the methodological sweepstakes has been the scenario,” in keeping with the trend toward less formalism); **Robert U. Ayres** on deficiencies in technology forecasting and bottlenecks holding up economic growth (information overload, linguistic babble, excessively complex systems, and dependence on fossil fuels); **W. H. Clive Simmonds** on using a “full-cycle approach” to track analysis of a futures problem and sense where a whole system should be going.

Ian I. Mitroff wonders if we are “slip, sliding away” despite the proliferation of models and findings in the past 20 years, and describes four scenarios for the US economy (growing prosperity without substantial change, prosperity with adjustment, slow recovery after substantial pain, and catastrophic decline); **Donald N. Michael** views our society as increasingly incoherent, and worries that pressures for short-term responses to critical issues will dominate social action (and that we lack the norms and processes for appropriate governance); **Yehezkel Dror** confesses that presently available forecasting and policy analysis methods are as a whole very inadequate and often misleading, and offers 22 advanced policy reasoning ideas (macro-policy as a main focus, long-range and dynamic situation estimates as the main bases, thinking-in-history as a main mode, concentration on critical choices and breakthrough opportunities, fruitful interfaces with utopian and critical policy contemplation, etc).

Other articles include **William Ascher** on limits of expert systems for political-economic forecasting; **Harold A. Linstone** on

infotech impacts to democracy; **Edward Wenk Jr** on the politics of technology and technology-related policy issues; **M. Nawaz Sharif** on technological leapfrogging and developing countries; and **Hyung Sup Choi** on transition from technology imitation to creation in Korea. [NOTE: Far from a coherent “agenda,” but still an excellent collection of state-of-the-art essays by leading futurists.]
(**leading futurists on futures methods**)

22

Forecasting, Planning, and Strategy for the 21st Century. Spyros G. Makridakis (Research Professor, INSEAD, Fontainebleau, France). NY: The Free Press, May 1990/293p/\$29.95. (Brief version in *Long Range Planning*, April 1989.)

Managers make many decisions each day, and the great majority of them refer to future events. Facing up to the future and the uncertainty that surrounds it, in an intelligent and pragmatic way, is a critical necessity for today's manager. It requires accurate forecasting, effective planning, appropriate strategies, a great deal of creative thinking, an effective organization, and considerable implementation skills. Eight tasks are required to improve future-oriented decision-making: 1) understand the **limitations of managerial theories** and mistakes made in the past (a 4-page chart lists 33 major theories such as the systems approach, S-curves, searching for excellence, Theory Z, managing chaos); “the single most important task currently being neglected in management is learning” (general mistakes include fashionable theories, oversimplified theories, poor assumptions); 2) be aware of the **biases and limitations** of our judgment (a 2-page chart outlines 11 common biases such as failure to change one's mind, overvaluing recent events, illusory correlations, wishful thinking, selective perception, and underestimating uncertainty); 3) acquire knowledge of the **forces that shape the future** and their predictability (discusses six factors affecting forecast accuracy, trends vs. cycles, short-term vs. long-term, major innovations and breakthroughs in history); 4) comprehend the **advantages and limitations of planning** (six planning elements are discussed); 5) **uncertainty** must be understood and taken into account in all future-oriented decisions (the scenario approach can increase sensitivity to unlikely events); 6) develop more realistic and effective **approaches for formulating strategies**, both competitive and noncompetitive (the latter include a drive toward excellence, adaptation, promoting creativity); 7) constantly seek **creative ways** to generate ideas and solve problems (includes a chart of 23 successful practices of companies producing above average creative output, e.g., devote at least 10% of sales to R&D, give annual prizes, choose an idea or product champion); 8) understand the factors that contribute to **success and failure** (chapters are devoted to each). Factors that contribute to failure include natural processes, organizational arteriosclerosis, the dazzle of new technology, taking unwise risks, overextending resources, overoptimism, ignoring the competition, preoccupation with the short-term, and belief in quick fixes. Elements of success include the right mix or resources at the right place and time, considerable and continuous effort, and new ideas that open new markets. [NOTE: An interesting and useful hodge-podge of advice to business managers, perhaps valuable to other managers too. Excellent consideration of biases, uncertainty, success and failure, and difficulties and paradoxes. Weak on population/resource/environment aspects of the long-term future (the recurring “environmental blind spot” that afflicts many in the corporate culture).]
(**improving future-oriented decisions**)

23

The Handbook of Forecasting: A Manager's Guide. Edited by Spyros Makridakis (INSEAD, Fontainebleau, France) and Steven C. Wheelwright (Graduate School of Business, Stanford U). NY: Wiley-Interscience, May 1982/602p/\$49.95.

The 33 essays are arranged in four parts: 1) **Role and Application of Forecasting in Organizations**: sales forecasting requirements, requirements for operations planning and control, capacity planning, financial forecasting issues, forecasting in strategic planning, procedures in forecasting. 2) **Approaches to Forecasting**: smoothing methods for short-term planning, ARIMA models for time series forecasting, decomposition methods for medium-term planning and budgeting, higher order smoothing methods, econometric methods, judgmental and Bayesian forecasting, monitoring and adjusting forecasts, integrating medium- and long-term forecasting. 3) **Forecasting Challenges**: environmental change, life-cycle forecasting, forecasting recessions, an eclectic approach to forecasting macroeconomic variables, country political risk, energy forecasting, anticipatory analysis for new entry strategies, forecasting for industrial products and for service products, why long-term forecasts will probably be wrong, evaluation of forecasts, selecting and using external data sources and forecasting services. 4) **Managing the Forecasting Function**: deciding what to forecast, integrating forecasting and decision-making, organizational and behavioral aspects of forecasting, the forecasting audit, and pitfalls in forecasting. In a final summation on the future of forecasting, the editors foresee an increasingly important role for forecasting, but it will not become easier or necessarily more accurate. Business forecasting will have to be enlarged to include political forecasting, energy forecasting, technological forecasting, and related fields. Developing procedures to incorporate these other aspects into planning will be essential. Above all, planners and decision-makers will have to understand that forecasting cannot eliminate uncertainty. Concludes with a glossary of about 250 forecasting terms.

(forecasting for business)

24

Forecasting and Management of Technology. Alan L. Porter (Georgia Inst of Technology), A. Thomas Roper (Rose-Hulman Inst of Tech), Thomas W. Mason (R-HIT), Frederick A. Rossini (George Mason U), and Jerry Banks (GIT). NY: Wiley-Interscience,

1991/448p/\$64.95.

A basic textbook on technology forecasting and assessment for business and engineering students, aiming to be an “ex-rated book” (with explicit cases, many exhibits, and exercises at the end of each chapter). **Part 1: Overview and Principles:** technology as a key to national competitive advantage, theories of social change (evolutionary, cyclic, functionalist theories that see return to equilibrium states, class conflict theory, critical social theory), sociotechnical change, processes of innovation, technology planning methods, managing the forecasting project; **Part 2: Technology Forecasting Methods:** forecasting strategies, stimulating individual and group creativity, monitoring/scanning, quantitative trend extrapolation, S-curves, expert opinion and the Delphi technique, simulation, cross-impact analysis, system dynamics, scenarios, economic forecasting and analysis; **Part 3: Assessing Technological Change:** general issues in impact identification and assessment, analyzing impacts (on technology, organizations, society, culture, politics, environment, health), benefit/cost and risk analysis, measures to evaluate technologies, visions of the future to manage the present. Appendices provide a bibliography of about 400 items, and the Technology Forecasting TOOLKIT on a 5¼” floppy disk (a set of computer-based tools to support many of the methods presented in the text).

(technology forecasting/assessment textbook)

25

Technological Forecasting for Decision Making. Third Edition. Joseph P. Martino (Senior Research Scientist, U of Dayton Research Institute). NY: McGraw-Hill, Jan 1993/462p/\$64.95 (includes software).

Since the first edition (Elsevier, 1972) and the second edition (North-Holland/Elsevier, 1983), “there have been significant advances in the art of technological forecasting. These include refinements and improvements of older techniques, as well as some completely new techniques.” [NOTE: Essentially the same statement made in the Preface to the Second Edition, **FS Annual 1983 #5498.**] Chapters cover the Delphi procedure, forecasting by analogy with some earlier technology, growth curves, trend extrapolation, measures of technology, correlation methods, causal models, probabilistic methods [NOTE: the only all-new chapter], environmental monitoring for breakthroughs, combining forecasts, normative methods, planning and decision-making, tech forecasting for R&D, tech forecasting in business decisions and government planning, technology assessment, common forecasting mistakes (overoptimistic and overpessimistic estimates, ignoring developments in other fields and countries, changes in values or politics, vested interests, etc.), evaluating forecasts as decision information, and presenting the forecast. [NOTE: The chapter outline remains virtually the same as in 1983, and most of the references and examples are pre-1983. ALSO SEE: **Forecasting and Management of Technology** by

Porter/Roper/Rossini/Banks (above), another basic textbook which is as good or better.]

(tech forecasting textbook)

26

The Heavens Are Falling: The Scientific Prediction of Catastrophes in Our Time. Walter J. Karplus (Head, Computer Simulation Laboratory, UCLA). NY: Plenum Press, April 1992/320p/\$24.95.

After introductory chapters on predicting by modeling and simulation, Karplus surveys the most hotly debated catastrophes that many scientists have predicted will imminently endanger the lives of many people worldwide. Each chapter looks at the theories, data, predictions, and related politics: **1) Ozone Layer Depletion:** the threat is certainly here, but threats of overpopulation and AIDS are greater; **2) The Greenhouse Effect:** we are definitely in an era of global warming, and buying “insurance” is a prudent course; **3) Nuclear Energy Radiation:** a real danger, requiring careful monitoring of radiation levels worldwide; **4) Air Pollution and Acid Rain:** the fight against air pollution in Los Angeles may in some ways serve as a model for global projects; progress can be made, but only at a very high cost; **5) AIDS:** the epidemic is extracting the biggest toll at present, and “things will get a lot worse”; **6) Overpopulation:** the oldest of the threats, and the fountainhead of most of the other catastrophes discussed here; “it would be unrealistic to project a world population under 12 billion by the year 2034”; **7) Economic Collapse:** “catastrophe prediction based on economic models are almost completely devoid of credibility”; **8) Earthquakes:** any prediction specifying an exact time, location, and magnitude of “The Big One” should be rejected; buildings should be built to code, but there are better investments in public safety and health.

Concludes that all of the catastrophes discussed are cause for great concern, and merit attention and coordinated efforts to keep them from happening or to minimize impacts. Governments should establish some agency to deal rationally with catastrophe management and to decide how resources should best be allocated. [NOTE: The title of this thoughtful, non-technical introduction is overly flippant; Karplus is serious about these possible catastrophes, while offering many useful perspectives. ALSO SEE: **The Futurist Poll: Future Fears** (*The Futurist*, March-April 1993, p49) which gives readers an opportunity to offer their opinions on nine major threats.]

(catastrophe prediction)

27

Strategic Planning and Forecasting: Political Risk and Economic Opportunity. William Ascher (Dept of Political Science, Johns Hopkins U) and William H. Overholt (VP, Bankers Trust). NY: Wiley-Interscience, Sept 1983/311p/\$29.95.

Forecasting must be studied not in isolation, but in the context of a policy-making process. An exclusive emphasis on formal methods, particularly on complex quantitative methods, will often prove self-defeating. The authors seek to do the following: 1) locate forecasting as one logical component of the decision-making or strategic planning process; 2) analyze the psychological and bureaucratic relationship between the forecaster and the decision-maker; 3) identify the properties of different analytic methods in the context of different purposes and organizational settings; 4) emphasize the importance of political assumptions in non-political forecasting; 5) show how to interrelate political and non-political factors; 6) offer an organizational approach to political forecasting that is systematic but non-quantitative; 7) recommend the use of systematic scenarios and an emphasis on forecasting as heuristics, rather than an excessive emphasis on predicting discrete outcomes; 8) describe how to present forecast results so as to ensure their maximum effective use.

(forecasting in context)

C. Planning and Visioning

28

Planning: Universal Process. Melville C. Branch (Prof of Planning, USC). NY: Praeger, Feb 1990/234p/\$39.95.

“Planning is an integral part of everyday life in the home, in personal, occupational, and cultural affairs, in business, military operations, and civil government.” Organized forethought is common and necessary, as the ordinary conduct of everyday affairs requires more and more planning. “Planning is the only hope of coping and surviving.” There are now several hundred US academic programs at the university level which provide graduate education in urban and regional planning, public administration, business management, and military staff support. Short courses and seminars in planning are offered as part of continuing education in other fields. This book explains planning as a fundamental and universal process: its historical roots, development over time, procedures, accomplishments, failures, and potential contributions. In looking toward the future, Branch discusses critical problems that planners must face (nuclear war threats, overpopulation, pollution, bureaucracy, addiction, education, vulnerability of systems), human limitations and capabilities, the political context, growing institutionalization, and realization of plans. Concludes that the one category of planning that has not been applied successfully in the US is comprehensive planning by Federal, state, and local government. The major analytical challenge in such planning is to take into account important components that cannot be accurately measured and meaningfully quantified.

(introduction to planning)

29

Planning and Human Survival. Melville C. Branch (Distinguished Prof Emeritus of Planning, USC). NY: Praeger, June 1992/172p/\$39.95.

Goes beyond **Planning: Universal Process** (Praeger, 1990; **FS Annual 1992** #11522) to look at critical problems confronting human society, as well as human characteristics and societal features that affect planning. Projects of all kinds, large and small, require plans in some form. Discoveries in science and technology have vastly expanded capacities to successfully plan and construct projects of great size and technical complexity. As to be expected in such a fundamental and universal process, there have been failures as well as successes. But it is clear that people can plan and produce impressive accomplishments. It is also clear that human societies today are beset with problems so severe that they threaten the well-being or even the survival of the human species. “The critical question today and for tomorrow is not whether humans have the mental ability to plan and shape their future to a degree, if not to the extent they would like. It is whether their instinctive drives and emotional reactions and preferences—far older and more basic than mental acuity—will enable people to respond to problems and needs as rationally as effective planning requires.” After discussing types and applications of planning, and advancing planning education and knowledge, Branch concludes that, as a universal process, planning will continue to be an integral part of human affairs, becoming more and more critical as man's activities become more interdependent. “Fewer and fewer decisions can be made without organized forethought based on thorough analysis.” Indeed, a high order of planning will be required for societies to function. All planning should be conducted comprehensively, since no important consideration should be overlooked. Comprehensive planning (or master planning or system planning) “seems so sensible one would presume it is practiced as a matter of course, but this is not the case.”

(planning as increasingly important)

30

National 21st Century Studies: Model for an Effective Approach, Martha J. Garrett (European Coordinator, Institute for 21st Century Studies, Molndal, Sweden), *Futures*, 22:4, May 1990, 339-354.

The lead article in a Special Issue on **National 21st Century Studies**, edited by Garrett. Such studies are being carried out in most parts of the world today, and are gaining considerable attention. They differ in four important ways from most routine research done by planning agencies: 1) they examine many sectors; 2) they do so in an integrated way, focusing on connections; 3) they take

a long-term perspective; 4) they seek to identify national strategies. The Institute helps these study teams by assisting individuals in launching projects, training teams, suggesting organizations and consultants, assisting teams in publication, and organizing international meeting. Garrett goes on to describe sponsorship and funding, sectoral coverage (27 topics are suggested, although not all are necessary), methodologies, and purposes. Concludes that an effective 21st century study should have the following characteristics: it should be a team effort, sponsorship and funding should protect the team's intellectual freedom, multisectoral coverage should broadly cover key issues, and multiple methodologies should be used. A good study may be normative or non-normative—pointing to one particular chosen future, or providing a map of alternative futures. [NOTE: The Institute for 21st Century Studies, headed by Gerald O. Barney, is at 1611 N. Kent St, Suite 610, Arlington VA 22209.]

(model for effective 21st Century Studies)

31

Some Advice to National 21st Century Study Teams: Three Questions to Consider, Martha J. Garrett (European Coordinator, Institute for 21st Century Studies, Molndal, Sweden), *Futures Research Quarterly*, 5:2, Summer 1989, 5-24.

National 21st century studies are important, and have the potential to influence the future of a country. But to fulfill that potential, they must be done well. Study teams

should address three questions. **1) Are we addressing the important issues?** A team may sincerely intend to look at every important issue, but “paradigm blindness” is widespread because of shared values among team members, fear of controversy, and narrow disciplinary perspectives. **2) Are we keeping technical matters in perspective?** “21st century study teams have a tendency to get swamped in their data, lost among their methodologies, hypnotized by their models, and tied up in their computer tape.” Thinking matters more than technique in connecting sectors and designing alternative futures. Data do not make a study, and not every model is necessary or relevant. **3) Are we giving study logistics enough attention?** Logistics include all the activities through which the study is organized, carried out, released, and put into effect by influencing policy decisions. Perhaps because these matters are very people-oriented, many team leaders unfortunately consider them to be of secondary importance. Factors such as internal team dynamics and the effectiveness of supporting boards may in the end determine the study's actual impact. [NOTE: Important guidelines for any large futures project.]

(advice to 21st century study teams)

32

Proceedings of the Second International Meeting on 21st Century Studies. Vol I: Global Studies. Edited by Gerald O. Barney and Martha J. Garrett (Institute for 21st Century Studies, 1611 N Kent St, Arlington VA 22209). Paris: UNESCO Bureau of Studies and Programming (7 place de Fontenoy), Major Programme I (World Problems and Future-Oriented Studies), Oct 1989/259p.

Proceedings of a Washington DC meeting on 21st century studies of various countries, held in conjunction with the World Future Society's Sixth General Assembly in July 1989. Martha J. Garrett offers sage advice to 21st century study teams on addressing the most important issues, giving study logistics enough attention, and keeping technical matters in perspective (good thinking matters more than technique, data do not make a study, not every model is necessary or relevant). Other papers discuss national strategic planning to meet the challenges of a turbulent world order, the GLOBUS model, global environmental change, the Human Dimensions of Global Change Programme (a complementary effort to the International Geosphere-Biosphere Programme), the World Council of Churches invitation to engage in a conciliar process of mutual commitment (covenant) to justice -peace-integrity of creation, the Eco-Justice Task Force of the Presbyterian Church (concerned with keeping and healing the creation), an economic scenario that shifts top priority from production growth to environmental preservation, and the LEAP method (Long-range Energy Alternatives Planning) to foster integrated and on-going energy planning.

Three additional volumes report on specific national studies. **Vol II-America** (164p): a system dynamics model for US energy policy planning, the Sustainable Society Project to explore a desirable 50-year path for development in *Canada* (based on earlier notions of the Conserver Society), planning for the future in *Costa Rica*, the Costa Rican National Conservation Strategy for Sustainable Development, an action strategy for *Columbia*, and the *Mexico 2010* project on possible long-term futures. **Vol III-Asia/Pacific** (163p): population/resource problems of *Turkey* toward the year 2000, the threat of ecological disaster in *India*, reflections on the 1982 *Japan in the Year 2000* report, development in *Thailand* in the next few decades, industrial development in the *Republic of Korea*, technological trends in *China*, an agenda for economic and ecological sustainability in *Australia*. **Vol IV-Europe** (268p): the *Britain in 2010* project of the Policy Studies Institute in London, reflections on the *Ireland in the Year 2000* reports (1980-1985), the *Iceland 1985-2010* study, reflections on the 1978 *Iceland 2000* study, the *Portugal 2000* project, the study of the *Poland 2000* Committee on basic scenarios of national development, alternative development paths for *Europe* in view of climate change. [NOTE: A mixed bag of papers, nevertheless essential for anyone attempting a 21st century study.]

(21st century studies in 17 countries)

33

Managing a Nation: The Microcomputer Software Catalog. Second Edition. Edited by Gerald O. Barney, W. Brian Kreutzer, and Martha J. Garrett (Inst. for 21st Century Studies, Arlington VA & Molndal, Sweden). Boulder CO: Westview, Jan

1991/338p(8x11")/\$48.50pb.

Greatly expanded over the 85-page first edition (**FS Annual 1986** #8046) that reviewed 52 models, this compilation reviews 127 microcomputer programs of relevance to people around the world who are managing the current and future affairs of their countries. Special emphasis is given to software useful to teams carrying out national 21st Century Studies (integrated, multisectoral investigations of long-term future possibilities). Contents are in three parts: **1) Sectoral Software:** agriculture (Famine Early Warning System, General Dynamic Commodity Cycle Model), demography (Future Population), health (AIDS epidemic model), education (Primary Education Tracking System), economy (System Dynamics National Model), energy (FOSSIL2, Beyond Oil), environment (Atmospheric Greenhouse Model), natural resources (Irrigation Development Model, Water Use Forecasting), national security (Theater Analysis Model), politics (Environmental Assessment System), rural and urban development (City Growth, Co-Composting Spreadsheet); **2) Integrated Models:** multisectoral national models (Life Cycle of Economic Development, Enhancing Carrying Capacity Options), global models (WORLD3, International Futures Simulation, GLOBUS); **3) Tools:** a skeptic's guide to strengths and weaknesses of computer models, sources of data, a guide to modeling languages, geographic information systems, overview of artificial intelligence in government, and relevant books/journals/catalogs/newsletters. The editors note that "The hardware and software available today is impressive enough to justify every national government giving this technology high priority." [ALSO SEE: **The Electronic Oracle: Computer Models and Social Decisions** by Donella Meadows and J. M. Robinson (see item #81), an authoritative critique warning that models still ignore much of the real world.]

(software catalog for governments)

34

Initiation of Strategic Planning by Governments, John M. Bryson (U of Minnesota) and William D. Roering (U of Florida), *Public Administration Review*, 48:6, Nov-Dec 1988, 995-1004.

Government leaders have become increasingly interested in strategic planning since the early 1970s, due to wrenching changes that have beset the public sector. Changes in organizations normally occur through disjointed incrementalism or "muddling through." A process designed to force important changes can be a highly desirable improvement—or an action doomed to failure. Normally, "most efforts to produce fundamental decisions and actions in government through strategic planning will not succeed." This is illustrated by the authors' study of strategic planning initiation by eight government units in the Minneapolis metro area (five suburban cities, a county government, and two units within the county government). Each unit used the same basic 8-step process, which proved a clear success in only two of the six units completing strategic plans (two units discontinued the process). In all of the cases, the attempt to initiate strategic planning was prone to disintegration, due to departure of key actors or absence of planning team members. Successful initiation required a strong process champion, and successful completion depended on the presence of a powerful sponsor to legitimize the process.

Some conclusions: 1) governmental strategic planning is probably most needed where it is least likely to work; 2) to *initiate* strategic planning, the following pieces of the quilt should be in hand: a powerful process sponsor, an effective process champion, a planning team, expectations of disruptions and delays, a willingness to be flexible; 3) to *institutionalize* a strategic planning system, the following elements are needed: mission statements, policy objectives, periodic situation analyses and strategic issue identification, multicriteria evaluation procedures; 4) government strategic planning probably should not be judged by private-sector standards because there are more stakeholders; 5) the strategic planning process in practice seems to be "a divergent, partially convergent, partially cumulative process." [NOTE: At last! A real-life glimpse of what may commonly happen in strategic planning, in contrast to isolated case studies of success and rah-rah textbook idealism. This is not to suggest that strategic planning shouldn't be attempted, but only to alert would-be planners to bumps in the road.]

(strategic planning initiation)

35

Mastering the Politics of Planning: Crafting Credible Plans and Policies That Make a Difference. Guy Benveniste (Prof of Policy Planning, School of Education, U of California-Berkeley). San Francisco: Jossey-Bass Publishers, Aug 1989/314p/\$24.95.

Planners and policy analysts have traditionally acted as technical specialists, providing rational and objective analyses and recommendations to policymakers and managers. Acting in this way, they will find that their work has little or no impact. Chapters discuss why planning is political (because it can make a difference), a logic of effective planning (such planning is a management tool to help organizations cope with uncertainty), responsibilities of an effective planner for the longer term, utopian planning (inventing ideal images of the future that are not yet credible but may test what is possible), six theories of planning, planning to handle uncertainty, effective planning as organizational learning (at the top, bottom, center, and periphery of the organization), the multiplier effect of credible plans, building coalitions and networks to support plans, planning logistics (selecting the right team, effective communication), how to keep plans on course (avoid derailment by: endless modification and postponement, cost and time overruns, bureaucratization and sterile number-crunching, piling on additional tasks).

Some concluding comments on effective planning: 1) the worldwide rise of bureaucracy has diminished organizational ability to cope with change; 2) ponderous, top-down, bureaucratic planning will increasingly fail to achieve worthwhile results; 3) as we move into the 21st century, the distinction between planners and policy analysts will tend to disappear, and differences between

public- and private-sector planning will narrow; 4) the informal elements of effective planning provide a basis for nurturing change from both the bottom and the top; 5) “the planner as manager of change is an activist confronting opposition from the past;” 6) as change continues and even accelerates, future planning, if anything, will be more disorderly, intermittent, partial, and incomplete than ever; 7) future planners will be expected to share delegated responsibility with the Prince, and to be accountable for it; 8) the democratization of planning in organizations or societies depends on the extent to which stakeholders can mobilize around collective interests; 9) planning is a social invention—a social process that can produce significant changes. [NOTE: Read this book; get smart.]

(effective planning)

36

Envisioning the Future, Warren Ziegler (President, The Future-Invention Associates, Denver CO), *Futures*, 23:5, June 1991, 516-527.

Acts of envisioning involve coming to a palpable sense of what the future can and should be within the contexts, action-settings, and concerns of the envisioners. The positivistic fields of the behavioral sciences and the quantitative disciplines of forecasting are of little help in this very new—and very ancient—approach to the future. Some examples of envisioning occasions: developing a new city plan, planning corporate strategy, middle-aged people inventing their personal futures, and a group of teachers articulating a preferred future for education. Some intellectual antecedents: Gabor's *inventing the future*, de Jouvenel's *surmising forums*, Friere's *conscientization*, Polak's *social imagination*, and Dewey's faith in *democratic experience*. Some principal concepts: the future is not the domain of knowledge but of action; “the future is a metaphor for the human imagination” and starts with unlearning; participants in an imagining workshop form themselves into a community of learners. The five stages of envisioning: discerning of concerns, focused imaging of compelling visions, creating shared vision, connecting the future with the present, and discovering strategy paths and actions to move into the future. [NOTE: Sophisticated and authoritative. ALSO SEE: other essays in the same issue of *Futures* on imaging the future: *Changing Images of Futures in the 20th Century* by Richard A. Slaughter (499-515) and *The Challenge of Imaging Peace in Wartime* by Elise Boulding (528-533).]

(envisioning preferred futures)

37

The Book of Visions: An Encyclopedia of Social Innovations. Edited by Nicholas Albery (Chairman, ISI). London: Virgin Books, 1992/336p(8x11")/£14.99pb.

A social invention or social innovation is a new and imaginative way of tackling a social problem or improving the quality of life. Brief descriptions of “over 500 of the best ideas from around the world” are arranged in 25 chapters on children and education (UK Youth Parliament, pupil-run businesses at school, school social audits), relationships, housing, new money systems, taxation, unemployment, economics and business, welfare, crime, health (promoting self-esteem, medical advice by phone, black triangles for new medicines), neighborhood (community audits, cohousing, a Neighborhood Initiatives Foundation), environment (Declaration of the Rights of Posterity, redirecting space debris, non-poisonous slug control), quality of life, science and technology, transport (insurance sold with petrol, neighborhood car rental, a hydrogen car), communications (rural telecottages, using your fax to stop torture, brainstorming improvement, evaluating conferences), arts and leisure, the developing world, peace schemes, politics, green spirituality, old age (elders in schools, grandparents for latch-key kids, visiting dogs for the elderly), and death and dying.

The final chapter, **Promoting Social Inventions**, describes Social Experiment Districts (proposed), The Futures Circle in Sweden, future workshops, an electronic Global Suggestions Box, Global Action Plan for the Earth, the Mega-Cities project, the American Values Community Action Network in NYC, the San Francisco Brain Exchange, the International Futures Library in Salzburg, Michael Young's National Suggestions Centre in the UK (1968-1974) and why it failed, the Centre for Social Inventions in Copenhagen, and the Foundation for Social Innovations in Moscow. [NOTE: Many interesting and important ideas in various stages of realization; also many ideas that are trivial, wacky, and mere rough-sketch proposals. The strength of encouraging grass-roots invention worldwide (ISI even offers £1000 a year in prizes for the best social inventions”) is also its weakness, for the populist/egalitarian zeal discourages any discrimination between workable and questionable, important and unimportant. A “Top Ten” or “Top Fifty” list would help to separate the wheat from the chaff. ISI also conducts social invention workshops and publishes an occasional *Social Inventions Journal* (£15 or £17 outside UK from Institute for Social Inventions, 20 Heber Road, London NW2 6AA).]

(social inventions worldwide)

38

Visionary Leadership: Creating a Compelling Sense of Direction for Your Organization. Burt Nanus (Prof of Management, USC). Foreword by Warren Bennis. San Francisco: Jossey-Bass Publishers, Sept 1992/237p/\$24.95.

Co-author of **Leaders** (Harper & Row, 1985; **FS Annual 1985** #6911) and author of **The Leader's Edge** (Contemporary Books, 1989) views our institutions as needing the kind of visionary leaders that built them in the first place—leaders who were determined and confident in their sense of direction, unafraid to take risks, bold, and inspiring. But leadership today is much more difficult than

it once was. “Even as it gets tougher to be a leader, it becomes more necessary.” And successful leaders say that vision is the guiding light and driving force for their organizations. “There is no more powerful engine driving an organization toward excellence and long-range success than an attractive, worthwhile, and achievable vision of the future, widely shared.”

Chapters describe leadership roles (direction setter, change agent, spokesperson, coach), warning signs of needing a new vision (confusion about purpose, employee complaints, excessive risk avoidance), properties of a good vision (fits the organization and the times, sets standards of excellence, inspires enthusiasm, easily understood), setting out to develop a new vision, the vision audit (asking about purposes and the values that govern behavior), the vision scope (considering constituencies and their needs), identifying important future developments and their significance, building scenarios of the future environment and drawing implications, the leader as great synthesizer, translating the vision into reality, organizational learning and re-visioning, the prudent visionary (don't do it alone, don't be overly idealistic, reduce possibilities of unpleasant surprises, don't be too preoccupied with the bottom line, be flexible and patient in implementing the vision, never get complacent), 21st century organizations (global in scope, complex, rapidly changing, staffed primarily with highly-skilled knowledge workers, multi-purpose), and leadership for the public sector. [NOTE: Many of these wise ideas are in the many competing books on strategic management. Nanus, a leader in linking intelligent futures-thinking to effective leadership, writes with clarity and simplicity.]

(developing organizational vision)

39

The Leader's Edge: The Seven Keys to Leadership in a Turbulent World. Burt Nanus (Prof of Management, USC). Chicago: Contemporary Books, Sept 1989/224p/\$17.95.

Founder and former director of the now-defunct USC Center for Futures Research warns that lapses in leadership are everywhere in America, resulting in a sense of helplessness and resignation. “Never has the need for leadership been greater. With thousands of our major organizations overmanaged and underled, it is little wonder that anxiety about the future is so widespread in America.” This book is about the forces shaping US institutions (global integration, technological change, restructuring), and the contributions that leadership can make to the success of organizations and the nation, emphasizing the visionary part of leadership—positioning in a rapidly changing environment. Prevailing wisdom about leadership has become dangerously unbalanced: too much attention is paid to relations between leaders and followers/organizations, whereas conditions of the new age demand at least as much attention to the ever-changing external environment. The leader must constantly scan the future horizon in order to provide a true vision—a clear image of a desirable future—an achievable, challenging, and worthwhile target toward which people can direct their energies. The futures-creative leader balances the needs of the internal and external environments, the challenges of the present and the future, the micro and the macro perspectives, and the existential (what is) and the normative (what should be).

There are seven families of competencies or learnable “megaskills” for effective leadership: **1) Farsightedness:** the minds of futures-creative leaders must operate in the future tense, always searching for possible opportunities and threats; **2) Mastery of Change:** instead of trying to solve problems, leaders must treat them as dynamic situations subject to streams of decisions designed to transform or contain them; **3) Organization Design:** the instrument with which the leader creates the future is the organization, institution, or social movement; **4) Anticipatory Learning:** every leader is a lifelong learner committed to promoting organizational learning as well; **5) Initiative:** the leader must demonstrate an ability to make things happen, to fulfill the change-agent role; **6) Mastery of Interdependence:** in a complex and highly interdependent world, cooperation is much more important than competition; **7) High Standards of Integrity:** there can be no trust unless the leader is trustworthy—dependable and reliable, honest and honorable.

Today's leaders must be always renewing and reinventing themselves. Some suggestions for personal development: seek leadership responsibilities, find a mentor or role model, develop farsightedness by reading widely, learn how to promote teamwork, become a world citizen, be willing to experiment and take risks, concentrate efforts on a few matters of the highest long-term priority, and have fun at what you do. The futures-oriented organization is designed for adaptability and change, resists pressures for short-term results, and values preventive over curative action. “The leadership of a future-oriented organization uses anticipation of the future as its pacing mechanism.” The US government can help individuals and organizations to plan for their futures by creating national outlook institutions, developing better mechanisms for national pathfinding, sponsoring long-range global studies, and organizing for long-range thinking at every level of government. A major restructuring of important elements of US society is needed: we need our “perestroika Americana.”

(futures-creative leadership)

40

Realizing the Power of Strategic Vision, Ian Wilson (Senior Management Consultant, SRI International), *Long Range Planning*, 25:5, Oct 1992, 18-28.

Strategic vision is “a coherent and powerful statement of what the business can and should be (ten) years hence” (the time horizon varies with the nature of the business). Vision must be *coherent* to integrate goals and strategies; it must be *powerful* to generate commitment and motivate performance; it emphasizes what the business *can* be because a vision must be realistic; it must clarify what the business *should* be because it must clarify the values and aspirations of management, employees, and other stakeholders. Vision is thus part rational and part emotional. It embraces, but goes beyond, “strategic concept” and “driving force.”

Visioning takes time, but busy executives should articulate a vision because it is needed in uncertain times. “Being flexible” is not a strategy; a vision clearly establishes both a direction and a destination. Wilson goes on to list: 1) key elements of a vision (future focus, goals and success criteria, portrayal of a revitalized culture); 2) steps in formulating a vision (analyze the company's environment and resources, clarify values, develop a mission statement, identify goals, generate and select options); 3) pitfalls and pratfalls (executive impatience, failure of imagination, failure to build consensus or solve short-term problems, lack of flexibility, and failure to implement).

(strategic vision: what and how)

41

The Fifth Discipline: The Art and Practice of the Learning Organization. Peter M. Senge (Director, Systems Thinking Program, Sloan School of Management, MIT). NY: Doubleday/Currency, Aug 1990/424p/\$19.95.

The successful corporation of the 1990s will be a learning organization—one that is able to learn faster than its competitors. “The organizations that will truly excel in the future will be the organizations that discover how to tap people's commitment and capacity to learn at *all* levels in an organization.” Five new component technologies (or disciplines to be studied and mastered) are gradually converging to innovate learning organizations: **1) Personal Mastery:** the discipline of continually clarifying and deepening our personal vision, of focusing our energies, and of seeing reality objectively—an essential cornerstone of the learning organization; **2) Mental Models:** learning to unearth our internal pictures of the world—our assumptions and images that influence how we understand the world and take action; **3) Building Shared Vision:** the capacity to hold a shared picture of the future we seek to create; where there is genuine vision, people excel and learn not because they are told to but because they want to; **4) Team Learning:** instances where the intelligence of the team exceeds that of individuals in the team; such learning is vital because teams are the fundamental learning unit in modern organizations; **5) Systems Thinking:** the fifth discipline that integrates all of the others and gives us connection to a larger whole. Chapters discuss such topics as the laws of the fifth discipline (today's problems come from yesterday's “solutions”, the areas of highest leverage are often the least obvious, etc.), the art of seeing the forest and the trees, identifying the patterns that control events, ending the war between work and family (the artificial work/family boundary is anathema to systems thinking) and the new view of leadership (in a learning organization, leaders are designers, stewards, and teachers, rather than those who set directions and make key decisions).

(the learning organization)

42

Changing the Essence: The Art of Creating and Leading Fundamental Change in Organizations. Richard Beckhard (NYC; former Prof of Management, MIT) and Wendy Pritchard (London UK). San Francisco: Jossey-Bass Publishers, Feb 1992/105p/\$20.95.

Organizations were once guided by the assumption that they could control their own destinies in a relatively predictable environment. Increasingly, competitive supremacy will demand not only increased performance and profits, but capacity to innovate and learn. Organizational leaders must have a clear vision of the desired end state of the entire system. The vision then acts as an integrating force for many apparently disparate changes to be made. An integral part of a fundamental change strategy must be a decision to move to a learning mode, where both learning and doing are equally valued. This is an essential precondition for managing fundamental change effectively, and a fundamental change in its own right. A further essential ingredient is a clear commitment by top leaders to making a significant personal investment in developing an inspirational vision. Chapters discuss creating a learning organization (learning and change processes are part of each other), key-aspects of vision-driven change (creating the vision, communication, building commitment), systems thinking to view the organization as a whole, themes that may serve as the focus of fundamental change (changing the mission, identity, way of work, organizational culture, or stakeholder relations), aligning the organization (integrating roles, systems, and rewards), and strategies for leading the transition. [NOTE: Short and simple, but nothing new.]

(vision-driven change)

D. Scanning and Scenarios

43

Scanning: An Imperfect Activity in an Era of Fragmentation and Uncertainty, Michael Marien (Editor, *Future Survey*), *Futures Research Quarterly*, 7:3, Fall 1991, 82-90.

Several definitions of scanning are provided: postmodern hunting and gathering, seeking intelligence, a hybrid activity between research and browsing, and an important form of informal adult continuing learning. Scanning is a normal and healthy activity for all individuals, and should be one of the fundamental tasks of futures studies. The task is made more difficult in an era of growing fragmentation and uncertainty. And the task is inherently imperfect, as described by a dozen choices that we make, consciously or unconsciously, as to what we will or will not look at in our effort to understand the world: 1) rather than observing the world directly, all of us largely rely on mediated reality; 2) we tend to scan the present and ignore the recent past; 3) in a world of increasing video production, we often choose print over non-print; 4) some of us select either non-electronic or electronic sources;

5) in the US, we almost always choose English over non-English; 6) we favor non-fiction over fiction; 7) we often look only at periodicals or only at books, and frequently ignore the “gray literature” of reports and government documents; 8) we find certain people and media are credible, while others are not; 9) many of us listen only to those in our professional or disciplinary “tribe”; 10) most of us are disposed to optimism, while some of us favor pessimism; 11) we all favor those holding our worldview, while finding the ideology of others to be inadequate or repulsive; 12) some of us only look for trends, and not for possible events or potential policies for human betterment. All of these choices are hastened by the constriction of time, which keeps us from scanning all that we would like to scan. Awareness of these imperfections can help us to think about the costs and benefits of closing the gap between ideal and reality to some degree.

(scanning imperfections)

44

Anticipating Tomorrow's Issues: A Handbook for Policymakers. Lauren Cook, B. Jack Osterholt, and Edward C. Riley Jr (CSPA). Washington: Council of State Policy & Planning Agencies, 1988/77p(8x11" spiral).

Large organizations, state governments notably included, are scrambling to adapt to unforeseen changes in their environments. The use of issue scanning is proving its worth. Since 1985, the State Scanning Network of CSPA has helped executive branch policy and planning agencies to establish issue scanning activities. This handbook describes what has been learned in chapters on scanning (a typical program consists of a small group of analysts applying scanning techniques to a broad range of relevant information sources), the strategic planning context (pressures of change have created unanticipated issues, requiring better intelligence-gathering), the scanning process (executive endorsement is the most important prerequisite), translating scanning into better decision-making (scanners must consider how the program ties into current and proposed decision processes), and case studies (Minnesota, Texas, Wisconsin, and North Dakota). Scanning is not predictive, prescriptive, or hypothetical: it is concerned with specific impacts and pragmatic policy responses. Effective scanning programs are focused on change, target-oriented to state government, systematic, analytical, cumulative, and inter-disciplinary in cutting across programmatic and jurisdictional boundaries.

(state scanning programs)

45

Hands-On Futurism: How to Run a Scanning Project, Heidi Meeker (Co-Coordinator, Environmental Scanning Project, Hawaii Office of State Planning), *The Futurist*, 27:3, May-June 1993, 22-26.

A brief description of Hawaii's scanning project, seen as fairly typical of programs operating in 7 or 8 other states. The 14-member voluntary group (half of whom work in the Planning Office) subscribes to several dozen periodicals. Volunteers are assigned periodicals in which they search for items indicating a trend, an innovation, or a newly forming issue. Items they find are written up for a monthly meeting, after which the coordinators prepare a monthly report. In turn, this leads to a quarterly newsletter, *Future Wave*, sent to legislators, state managers, and the general public. The scans tend to cluster around issues of greatest concern to Hawaiians: education reform, environmental issues, trends in tourism, Japanese consumer patterns, eco-tourism, and the work of public employees. [NOTE: A rigorous study is needed on the costs and benefits of bottom-up scanning efforts in government and business. Such exercises seem to be good for eliciting participation and sensitivity to local issues. But voluntary groups lead to uneven reporting and superficial coverage. There are *hundreds* of periodicals that could be scanned, not to mention books and databases. Learning a little may be better than learning nothing. But the illusion of adequacy may inhibit learning much, much more.]

(Hawaii's state scanning project)

46

Trend Watching: How the Media Create Trends and How to be the First to Uncover Them. John E. Merriam (Publisher, *Issues Management Letter*) and Joel Makower (President, Tilden Press). NY: AMACOM (American Management Assn), March 1988/210p/\$17.95.

There are not only megatrends, but an endless number of microtrends that can play key roles in the success of any endeavor. Trend Watching involves reading or watching news media, counting issues and events, recording them for later examination, and using the data to formulate predictions about what might happen in the next 1-5 years. Chapters describe information as a major agent of change, the circular flow of news to and from the media, tools for Trend Watching (the major media, specialized media, local TV and newspapers, the multilens approach), determining what you want to know, what media to count, and analyzing and predicting. Graphs showing the ebbs and flows of major issues are shown for ten sectors of the economy: banking, consumer safety, energy, environment, finance, agriculture, health, high-tech, labor, and media. [NOTE: A precise short-term method, doubtlessly of some benefit, but also drawing attention away from broad and long-term trends which are often more significant. Although periodical-watching is important, *FS* readers should readily agree that some trends are best reported—and often only reported—in books.]

(short-term microtrends)

47

Information and the Future: A Handbook of Sources and Strategies. Alice Chambers Wygant (U of Texas Medical Branch, Galveston) and O. W. Markley (Studies of the Future Program, U of Houston-Clear Lake). Westport CT: Greenwood Press, July 1988/189p/\$37.95.

On how to quickly and systematically gather *situationally relevant strategic information*, or information needed to understand those parts of the system with which one needs to interact, so as to enable the making of good decisions. The handbook is designed as a textbook or a reference guide, for those who want to become proficient at information searching, or for those planning to hire professional searchers so that needed services can be specified. After a chapter on designing the information search process, chapters are devoted to a variety of sources: 1) basic facts on library catalogs and filing rules 2) general reference works: encyclopedias, yearbooks, references for futurists (reference librarians are the single most useful reference tool available to the researcher); 3) periodical abstracts and indexes, citation indexes; 4) online resources, and advantages and disadvantages of computer searching; 5) government agencies, officials, and documents; 6) interest groups and networks; 7) funding sources (corporate, government, and foundation grants); 8) other sources: AV media, computer software, experts, and dissertations. Two additional chapters discuss the issue emergence cycle and the strategic intelligence cycle, and provide a scenario of the "Mid City Strategic Development Subcommittee" to illustrate how the various methods and tools can be combined in a real-world setting. Some "Parting Tips": people are sometimes better sources than databases, adapt rather than adopt (there are no formulas for getting and using information), hard copy is better than online services at the outset, plan your search strategy to save time and money, and don't give up too early or hang on too long. [NOTE: A valuable next step for those who need sources beyond *Future Survey*. But this handbook is no panacea, e.g.: it is weak in certain problem areas (especially global issues), it offers no access to or appreciation of the 350+ futures-relevant periodicals, and it uncritically cites many works that are partly if not largely obsolete or simply not very helpful for *strategic* information.]

(how to get strategic information)

48

The Art of the Long View. Peter Schwartz (President, Global Business Network, Emeryville CA). NY: Doubleday/Currency, May 1991/258p/\$20.00.

A tri-author of **Seven Tomorrows** (Bantam, 1982; **FS Annual 1981-82** #3695) describes the writing of scenarios to make better decisions, with emphasis on his experience with Royal Dutch/Shell and Smith & Hawken. "Scenarios are not about predicting the future, rather they are about perceiving futures in the present." They are a tool for helping us to take a long view in a world of great uncertainty. A good scenario asks people to suspend their disbelief in its stories long enough to appreciate their impact. Chapters discuss such topics as the power of narrative, scenarios as myths of the future that enable us to examine our old mindsets, the "Greening of Russia" scenario that Schwartz and others developed at Shell in 1983 (based on an unknown man named Gorbachev coming to power; "every Soviet expert but one told us we were crazy"), hunting/gathering of information (topics to pay attention to: sci/tech, perception-shaping events, popular music, fringes), where to look, creating scenario building blocks (look for driving forces in five categories: society, technology, economics, politics, environment), the "global teen-ager" scenario ("there will be over 2 billion teenagers in the world in 2001," perhaps a significant force), composing a plot, and using scenarios to rehearse the future.

Three scenarios of the world in 2005 are provided: **1) New Empires:** prosperity in most of the world; markets increasingly decoupled by regional protectionism; right to pollute is a critical international issue; a conflict-prone world with little cooperation and a booming arms trade; **2) Market World:** a new global commons enables one vast market; decentralization and diversity are paramount; governments pursue national strategies for competitiveness and learning societies; companies continually rise, fall, restructure, and intermesh; huge energy efficiency improvements take place each year; nanotechnology and life extension are in full swing; **3) Change Without Progress:** a future of chaos and crisis; ruthless self-interest and corruption run rampant; the economy is a roller-coaster; the global information network is a cyberpunk world (hacker heaven); the EC never coheres and is considered a lost cause; the US lives in a perpetual nostalgia phase; technological accidents are common due to old and poorly-maintained systems. Concludes with an appendix listing 8 steps to employ in developing scenarios: begin with a specific decision or issue, list key local factors influencing success or failure of that decision, list driving trends in the macro-environment, rank key factors by importance and uncertainty, select scenario logics (the axes along which scenarios will differ), flesh out the scenarios, consider implications for the focal issue, and select leading indicators for ongoing monitoring. [NOTE: Much personal narrative makes for easy and intriguing reading. The "Global Teenager" scenario, despite numbers puffed by about 100%, is a fresh demographic slant.]

(scenario development)

49

Implementing Scenario Planning (Special Issue). *Planning Review*, 20:3, May-June 1992/48p/\$12.50 from Planning Forum, Box 70, Oxford OH 45056-0070.

Peter Schwartz (President, Global Business Network), author of **The Art of the Long View** (above), describes the most common scenario plots: 1) winners and losers (the "zero sum game"); 2) challenge and response (e.g., Japan's response to the 1973

oil shock was to rebuild its capital structure so as to be the world's most energy-efficient economy); and 3) evolution (involving a slow change in one direction, usually either growth or decline). Other common plots: 4) revolution (a sudden dramatic change); 5) cycles of decay and rejuvenation; 6) infinite possibility of expansion and improvement (a seductive perception that may make many things happen); 7) The Lone Ranger (a David in battle with Goliath); and 8) "My Generation" (the cultural influence of a large generation). **Daniel Simpson** (Director of Planning, Clorox Co, Oakland CA) lists the benefits of scenario planning in diversified companies (understanding and clarifying perceptions and assumptions of key managers, improving the speed of decision-making, maintaining a can-do attitude while serving up unfavorable outlooks), and some hazards (too many alternative scenarios, getting bogged down in elaborate plots, trying to complete the process too quickly). **Ian Wilson** (SRI International) explains the five-step process of scenario planning: tailoring to organizational needs, selecting targets of opportunity, developing communications, emphasizing manager education, and fine-tuning and up-dating scenarios. Five case studies follow (pp23-46): technology strategy at Statoil in Norway, the US defense industry after 1995 (ranging from strong to weak arms markets), 12 scenarios for Southern California Edison's power generation, energy requirements by 2007 for the Los Angeles Dept of Water and Power, and integrating scenarios into strategic planning at Royal Dutch/Shell. **(scenario planning)**

50

Scenarios: Uncharted Waters Ahead, Pierre Wack, *Harvard Business Review*, 85:5, Sept-Oct 1985, 72-89.

The first of two articles by the retired head of the business environment division of the Royal Dutch/Shell Group planning department, who helped develop a "scenario planning" technique that prepared Shell for the eventuality if not the timing of the 1973 oil crisis and the 1981 oil glut. Wack argues that forecasts can be reasonably accurate, but sooner or later they will fail when needed most. The way to solve this problem is not to look for better forecasts, but to accept uncertainty, try to understand it, and make it part of our reasoning. Uncertainty today is not a temporary deviation, but a basic structural feature of the business environment. Most scenarios, however, merely quantify alternative outcomes of obvious uncertainties. To be effective, good scenarios must involve top and middle managers in understanding change.

In the second article, **Scenarios: Shooting the Rapids** (*HBR*, Nov-Dec 1985, 139-150), Wack describes effective medium-term analysis that translates scenario theory into practice. Scenarios can organize a variety of seemingly unrelated information and translate it into a framework for judgment in a way that no model could do. The point is not so much to have one scenario that "gets it right," as to have a set of scenarios that illuminate the major forces driving the system and the critical uncertainties. In times of rapid change, a crisis of perception often causes strategic failure, particularly in large companies; the scenario approach has leverage and can make a difference in overcoming dubious assumptions and selective inattention. Indeed, the scenario process of converting information into fresh perceptions has something of a breeder effect, generating much more energy than it consumed. **(effective scenarios)**

51

Futures Under Glass: A Recipe for People Who Hate To Predict, John B. Robinson (Dept of Environment and Resource Studies, U of Waterloo, Canada), *Futures*, 22:8, Oct 1990, 820-842.

The predictive record of most forecasting is poor. Even if we could predict the long-term future accurately, we would usually be addressing the wrong question. What we want are not good predictions, but indications of what alternative futures seem available. A predictive orientation is not very useful to address environmental and resource policy issues, and the policy agenda is increasingly driven by such issues. In contrast to conventional forecasting, a scenario analysis method called "backcasting" is proposed. Its major trait is a concern with how desirable futures can be attained, not with what futures are likely to happen. It is explicitly normative, working backwards from a particular desired future end-point to the present in order to determine what policy measures would be required. Backcasting involves six steps: determine objectives, specify goals and constraints, describe the present system, specify exogenous variables, undertake scenario analysis, and undertake impact analysis. A two-year project called "Designing a Sustainable Society for Canada" uses the backcasting approach, along with a large-scale computer-based modelling system. **(backcasting vs. forecasting)**

52

Delphi in a Future Scenario on Mental Health and Mental Health Care, Rob Bijl (Netherlands Inst. of Mental Health, Utrecht), *Futures*, 24:3, April 1992, 232-250.

From 1987 to 1990, a future scenario study was carried out on mental health and mental health care in the Netherlands over the next two decades. A Delphi inquiry formed an essential part of the study, and various methodological issues are discussed here. The functions of a Delphi in a future scenario study are to increase knowledge about the subject under study, to confirm or correct information, to establish priorities, and to emphasize the validity of the results (the credibility of resulting scenarios depends not only on what is said but who has said it). In a traditional Delphi, consensus is a major objective, but this consensus is often specious because of pressure to conform to group opinions. The prime objective of a policy Delphi is to be a forum for ideas. Indeed, clarifying dissensus on the issues proved to be as relevant to the scenario users as was the elucidation of consensus. **(policy Delphi for scenario building)**

E. Other Relevant Methods

53

Future Workshops: How To Create Desirable Futures. Robert Jungk (Salzburg, Austria) and Norbert Müllert. London NW8 9XP: Institute for Social Inventions (24 Abercorn Place), Dec 1987/126p/\$10.00pb.

Jungk, a leading European futurist, was a powerless refugee from the Hitler regime in the 1930s; ever since, he has looked for ways that people can fight back and influence the course of events, because the future belongs to everybody. The future workshop is such a way, helping people to develop creative ideas and projects for a better society. Jungk ran his first workshop in 1962, and the workshops on various topics are now in demand all over Europe. Futures workshops can be used for problem-solving in organizations (factories, schools, voluntary organizations, etc.), designing development plans for families or neighborhoods, and enlivening seminars and meetings. Workshops are kept as simple and informal as possible, so that anyone can give it a try. No more than 15 to 25 persons should take part, so that everyone gets enough chance to speak. The ideal length of a workshop is three days, allowing a day for each of the three phases: 1) Critique: trying to get many brief headlines to encapsulate the problems; 2) Fantasy: taking a positive run at the problems, getting out of mental ruts, seeking alternatives, and telling our dreams to others without holding back or censoring ourselves; 3) Implementation: discussing solutions for practicality (coming up against the great divide between what we would like to see and the way things really are) and starting actions where possible. Concludes that futures workshops are a remarkable spur to learning—tools to develop human potential that can broaden and deepen the creative forces within society.

(futures workshops in Europe)

54

Social Marketing: Strategies for Changing Public Behavior. Philip Kotler (Distinguished Prof of International Marketing, Northwestern U) and Eduardo L. Roberto (Prof of Intl Marketing, Asian Inst. of Management, Manila). NY: The Free Press, Oct 1989/401p/\$29.95.

Literacy campaigns, family planning, and programs to combat drug abuse, AIDS, and teenage pregnancy are a fraction of the many social campaigns to change public behavior launched throughout the world. Solving social problems involves changing the ways individuals and groups lead their lives: changing values and attitudes, transforming harmful practices into productive ones, and creating new social technologies. More people in more societies are eager for social change than ever before. In the past, massive changes were brought about by force or violence. In the future, there will hopefully be a shift in favor of planned, voluntary, and nonviolent change. The authors examine the art and science of promoting planned and targeted social change, highlighting successful campaigns that have been launched by governments and/or by citizens. Chapters discuss the social marketing approach to social change, analyzing the social marketing environment, developing programs (designing the social product, managing costs of adoption, promoting through mass and selective communication, triggering actions of target adopters, managing service delivery, mobilizing influence groups), and managing social marketing (developing the marketing plan, implementing and evaluating programs). Given the vast changes that organizations seek to produce and the limited resources for social change programs, social change agents must seek to be efficient and effective. The knowledge, techniques, and technologies now exist to organize and implement effective social change programs in virtually every area of social concern, locally and nationally, in all nations of the world. [ALSO SEE: **Information Campaigns: Balancing Social Values and Social Change**, edited by Charles T. Salmon (Sage Publications, Aug 1989/312p/\$35.00;\$16.95pb).]

(social change through social marketing)

55

Future Edge: Discovering the New Paradigms of Success. Joel Arthur Barker (former Director, Future Studies Department, Science Museum of Minnesota). NY: William Morrow & Co, Jan 1992/240p/\$25.00.

A paradigm is a set of rules and regulations that defines boundaries and successful conduct inside the boundaries. A paradigm shift is a change to a new game and a new set of rules. "When the rules change, the whole world can change." One manages within a paradigm; one leads between paradigms. The three keys to the future for any organization are excellence, innovation, and anticipation. To improve innovation and anticipation, one must understand paradigms: they are all around us, they are functional, human beings can choose to change their paradigms, and "paradigm pliancy" is the best strategy in turbulent times. Conversely, "paradigm paralysis" (a terminal disease of certainty) is an easy disease to get and is often fatal. Some of the most important paradigm shifts of the 1990s: the regionalization of world economics, the greening of industry, quality everywhere, celebration of diversity (a paradigm shift in human resources), state-run gambling replacing taxes (a dangerous trend), fiber optics everywhere, energy conservation optimized, biotechnology everywhere, national health care, self-managing work teams, water as precious, and intellectual property as the key to wealth. Some new paradigms for the 1990s: solar/hydrogen/fission, time taxes (paying taxes by

community work—paying with one's time), “negawatts,” polymers, new building materials, fractals and chaos in mathematics, virtual reality, and Gaia. “The most important paradigm shift of the 20th century,” which has already demonstrated its power to transform companies and communities, is pursuit of Total Quality, which brings a return of artistry, craftsmanship, and spirit to work.

(paradigm shifts)

56

The Unbounded Mind: Breaking the Chains of Traditional Business Thinking. Ian I. Mitroff (Distinguished Prof of Business Policy, USC) and Harold A. Linstone (University Prof Emeritus of Systems Science, Portland State U). NY: Oxford U P, Feb 1993/177p/\$23.00.

An exercise in “applied philosophy” by two authors who have taught a number of courses in critical thinking, creative problem-solving, brainstorming, and systems analysis to corporate executives and graduate students. Chapters are devoted to five ways of knowing. Old Thinking includes agreement (the first way of knowing) and the world as a formula (analytical reasoning as the second way). Complex Thinking includes multiple realities (the third way) and conflict/contradictions (the fourth way). New Thinking (the fifth way) involves unbounded systems thinking, “where every one of the sciences and professions is considered fundamental.” Perpetual challenging of new assumptions is one of the most critical and central aspects of New Thinking about complex problems and social systems. “Too much rides on today's problems to pursue them from only one perspective.” In the end, the ultimate transformation is to see the world as an interconnected whole. [NOTE: Not the typical zippy business book. May be of some value to those with a background of philosophy, but the leaden argument—although important—is not well-organized.]

(unbounded systems thinking needed)

57

Managing the Unknowable: Strategic Boundaries Between Order and Chaos. Ralph D. Stacey (Lecturer in Strategic Management, U of Hertfordshire, UK). San Francisco: Jossey-Bass Publishers, Aug 1992/219p/\$25.95.

To survive the increasing onslaughts of international competition, organizations must be flexible and creative. But most Western managers believe that long-term success flows from a state of stability, harmony, predictability, discipline, and consensus—a state of “stable equilibrium.” Popular prescriptions that follow from this belief are to formulate a vision of an organization's future state, prepare long-term plans, set strategic milestones, and persuade people to share the same culture. This fundamental mind-set “is simply wrong.” Having a vision about the long-term future “is a soothing fantasy that distracts attention from, and weakens the resolve to deal with, the real world. Instead of sidestepping the issue of unknowability, managers must learn to face it head on.” Intense preoccupation with stability confines managers to strategies of repetition and imitation. Success for an organization does not depend on choosing stable equilibrium over explosive instability, but on pursuing a third condition of “bounded instability.” The new mindset is based on the new science of dynamics of nonlinear feedback systems, which are characterized by regularity and irregularity, with periods of chaos followed by new forms of order. Instead of visions and plans, effective managers should focus on ever-changing agendas of strategic issues, challenges, and aspirations, and promote multiple, contradictory cultures to foster different perspectives. “New strategic directions emerge spontaneously from the chaos of challenge and contradiction, through a process of real-time learning and political interaction.” Effective executives should create favorable conditions for, and participate in, complex learning and effective politics. Chapters discuss the failure of conventional management, creativity and continuous chaos, strategic thinking and continuous contention, strategic agendas and vision, improving group learning skills, and creating resource slack as a vital precondition.

(new “bounded instability” mindset)

58

Foresight Activities in State Government, Keon S. Chi (Senior Research Fellow, Council of State Governments), *Futures Research Quarterly*, 7:4, Winter 1991, 47-60.

A review of state foresight activities in six different settings: state futures commissions (30 are listed, with recent examples in South Carolina and Arkansas), executive branch, executive agency, legislative branch, judicial branch, and private or non-governmental organizations assisting state governments with foresight programs such as Illinois 2000, Arizona Tomorrow, and The Ohio Scanning Network. Foresight tools and techniques are classified in four headings: goal-setting or vision-creating, identifying issues or problems in the next 5 or 10 years, trends analysis, and alternative futures (using scenarios, models, and simulations). The most frequently-cited benefits of state foresight activities are informed decision-making for leaders and managers, improved communication between citizens and policymakers, and a greater sense of direction. However, most if not all foresight projects have been one-time efforts without a measurable record of continuous implementation. In the future, foresight activities must be conducted on a continuing basis. And public involvement is essential for an effective and continuous project. [NOTE: Excellent overview.]

(state foresight overview)

59

State Government Foresight in the U.S., Lauren Cook (Director, Emerging Issues and Executive Management, Council of Governors' Policy Advisors), *Futures Research Quarterly*, 6:4, Winter 1990, 27-40.

Foresight involves anticipating emerging issues, identifying unanticipated consequences, getting a sense of the big picture and major directions, supporting oversight and evaluation, and involving the public in meaningful discourse. Foresight can improve the tasks undertaken at each stage of the policy cycle: developing proposals, enacting policies and programs, and implementing programs. Various state experiences and experiments are summarized. Concludes with a list of prerequisites for effective government foresight, including committed leadership, consensus on the broad policy context, and a capacity to renew and adapt initial forecasts/analyses/goals/visions. [ALSO SEE: **Strategic Policy for the Nation's Governors**, 3rd ed., by Lauren Cook (CGPA, Nov 1990/36p), a summary of foresight in the US Government derived from the 1990 WFS Government with Foresight conference (*FRQ*, 6:4, 41-50), and **How State Governments Are Looking Ahead** by Richard J. Gross, Director of Policy for the Governor of North Dakota (*The Futurist*, 24:5, Sept-Oct 1990, 16-19).]

(foresight in government)

60

Foresight Studies: A New Approach in Anticipatory Policy Making in the Netherlands, J.W. Asje Van Dijk (Deputy Head, Longer-Term Studies Group, Ministry of Economic Affairs), *Technological Forecasting and Social Change*, 40:3, Nov 1991, 223-234.

Selection and priority setting in technology policies become more and more urgent. Foresight as a method of prospective analysis can help, not by forecasting the world of tomorrow, but by providing an early-warning mechanism to monitor emerging trends and opportunities. Foresight is a way to manage complexity in a world of increasing uncertainty. It serves six objectives: direction setting, determining priorities, contributing background information on emerging trends, consensus generation, advocacy, and communication/education. In 1988, the Dutch Ministry of Economic Affairs launched a "Technology Foresight Experiment" using several methodologies, and the process is outlined here. Lessons learned: 1) considerable emphasis should be given to learning approaches rather than deterministic forecasts; foresights in which actors coproduce the outcome are important; 2) legitimation and authorization are needed before starting a foresight experiment (participation of high-level experts and decision-makers was a critical factor); 3) foresights resulting only in common knowledge should be avoided; try to find "wild ducks" that result in uncommon proposals.

(foresight experiment in Netherlands)

61

Strategic Management of Public and Third Sector Organizations: A Handbook for Leaders. Paul C. Nutt (Prof of Management, Ohio State U) and Robert W. Backoff (Prof of Public Policy, Ohio State U). San Francisco: Jossey-Bass Publishers, Jan 1992/486p/\$37.95.

Chapters on the need to re-energize and change organizations, how strategic management differs in public and non-profit organizations, the uses of strategy (as a plan, a ploy, a stream of actions), applying strategic approaches, issues that pose barriers to achieving a desired future, organizing the strategic management process, formulating and implementing strategy, search techniques for uncovering information and new ideas (the nominal group technique, Delphi surveys, the synectics technique, scenarios), synthesis techniques to make sense of information, setting strategic priorities, and case studies of strategy in practice (in a nonprofit social services agency, a county library system, and forging a new mission in a state health agency). Concludes that the leaders of public and third sector organizations must find a way to create and manage transformations in response to dynamically changing needs. A periodic shift in emphasis is needed, from what to how and back again, creating a "dance of the what and how." [NOTE: A dull style that will undoubtedly appeal to some bureaucratic mindsets.]

(strategy for public and third sector organizations)

62

Issues Management: How You Can Plan, Organize and Manage for the Future. Joseph F. Coates, Vary T. Coates, Jennifer Jarratt, and Lisa Heinz (all J.F. Coates, Inc., Washington). Mt. Airy MD: Lomond Publications, July 1986/142p/\$18.50.

Issues management is the organized activity of identifying emerging trends, concerns, or issues likely to affect an organization in the next few years, and developing a wide and more positive range of organizational responses toward that future. Within the past decade, this new form of futures research has taken hold in corporate America, and is now beginning to be effectively applied in Federal, state and local government planning. This book, largely based on a report prepared for the Electric Power Research Institute, is organized in five chapters: 1) **Looking to the Future**: 60 long-term trends forming the basis for the future, tensions built into the search for better organizational foresight, the uses of foresight; 2) **Concepts and Processes of IM**: conditions for success (full commitment of top executives, broad participation at operating and staff levels), the life cycle of a public policy issue, principles for an effective issues identification program, 38 points of advice on getting started (don't preempt the functions of others, be positive but not Pollyannish, approach an issue with no preconceptions, only take top issues to top management, etc.); 3)

Methods and Techniques of IM: networking, precursor analysis, media analysis, expert panels, scanning, Delphi, consensor, scenario building, tech forecasting, trigger event identification, etc.; 4) **Establishing an IM System:** diagnosis as to whether IM makes sense, small beginnings, gradual expansion; 5) **A Research Agenda:** identifying the targets and priorities for further research.

(issues management)

63

Professional Developments in Policy Studies. Stuart S. Nagel (Prof of Political Science, U of Illinois-Urbana) and Miriam K. Mills (deceased; formerly New Jersey Institute of Technology). Prepared for the Policy Studies Organization. Westport CT: Greenwood Press, March 1993/264p/\$59.95.

Chapters in five sections: **1) Professional Elements:** developing a policy curriculum and a policy evaluation course, obtaining policy analysis jobs in Washington (with comments by several experts, including futurists Joseph Coates and Edward Cornish), grant-getting and publishing, professional ethics in policy evaluation; **2) Interdisciplinary Interaction:** improving public policy in developing countries, research utilization in policy-making; **3) Policy Studies Methods:** mathematical optimizing, statistical analysis, generating creative policy ideas, decision-aiding software, dispute resolution, super-optimizing analysis; **4) Cross-Cutting Governmental Activities:** the public-private controversy, incentives and economic growth, socialization (shaping policy-relevant attitudes of children); **5) Theoretical Perspectives:** theory of knowing, trends in policy analysis (higher goals, multi-criteria decision-making, more positive incentives); **6) Broadening Our Horizons:** improved policy analysis, finding a super-optimum package, improving policy analysis institutions, global policy studies. [NOTE: Good introductory overview by a long-time leader in policy studies, a realm that should be seen as overlapping futures studies, which is equally concerned with alternative directions. Regrettably, Nagel assumes a static world and makes no mention of futures studies, forecasting, trend analysis, or scenarios. On the other hand, futurists make no mention of policy-making or policy studies (which tends to be narrower in scope, more technique-oriented, and largely an American phenomenon).]

(policy studies introduction)

64

Social Impact Assessment Methods. Edited by Kurt Finsterbusch (U of Maryland), Lynn G. Llewellyn (US Fish & Wildlife Service), and C. P.; Wolf (Polytechnic Institute of NY). Beverly Hills CA: Sage Publications, Dec 1983/320p/\$29.95.

When nuclear power plants, dams, strip mines, and other major projects are planned, specialists are needed to assess social as well as environmental impacts. The National Environmental Policy Act of 1969 mandates such assessments of the human costs of new construction. These essays describe frameworks and methodological approaches, integrated methodology for large-scale development projects, data collection methods (survey research, ethnography, demographic change assessment, social indicators research) and specialized methodologies (computerized models, community needs assessment, psychological assessment, causes and correctives for errors of judgment, visual quality and visual impact assessment, and evaluation methods).

(social impact assessment)

65

Social Impact Analysis and Development Planning in the Third World. Edited by William Derman (Michigan State U) and Scott Whiteford (School of American Research, New Mexico). Boulder CO: Westview, Nov 1984/c250p/\$26.00.

National governments and international agencies have committed vast sums of money to development projects over the past three decades. Many projects, however, have not only failed to help the people they were intended to help, but have created more social and economic problems than they resolved. The failure of many of the projects can be traced to an inadequate understanding of the socio-cultural realities of the people they most directly affect, and to a lack of participation by these people in project planning, implementation and evaluation. Drawing on case material from socialist and capitalist countries, primarily in Africa and Latin America, the authors of these original essays show how socio-cultural factors should be incorporated into planning processes.

(impact analysis in Third World)

66

Social Impact Assessment and Monitoring: A Cross-Disciplinary Guide to the Literature. Michael J. Carley (Political Studies Institute, London) and Eduardo Bustelo (UNICEF, Brazil). Boulder CO: Westview, Oct 1984/c250p/\$32.50.

A critical review of more than 600 recent publications in social impact assessment (SIA) and related fields, based on the view that SIA is more than an analytical technique, but a logical and timely response to the ever-growing need for more and better information for decision-making in an increasingly complex world. Topics covered include social forecasting, SIA methodologies, socio-cultural effects, SIA in developing countries, public participation, risk, environmental impact assessment, monitoring, cost-benefit analysis, and decision analysis.

(social impact assessment guide)

67

Social Theories of Risk. Edited by Sheldon Krinsky (Prof of Urban and Environmental Policy, Tufts U) and Dominic Golding (Center for Risk Management, Resources for the Future). Westport CT: Praeger, Sept 1992/412p/\$59.95;\$22.95pb.

The field of risk studies grew out of the practical needs of industrial societies to regulate technology and to protect citizens from natural and technological hazards. The study of risk, once relegated to a narrow sector of academia and the insurance industry, has been nourished by the demands of public policy and has rapidly developed into a multidisciplinary field. Toxicologists, epidemiologists, and others in the health sciences have perfected models of hazard identification and risk estimation. The contribution of the social sciences has been to broaden the debate about risks beyond technical considerations, to explain the divergence between public and expert views of risk, and to point out that expert knowledge is not value-free. The 15 essays discuss the history of risk research, a systematic classification of risk perspectives (cultural theory, the psychological approach, probabilistic risk analysis, the actuarial approach using statistical predictions, the economic approach using risk-benefit comparison, etc.), theory in risk studies, progress in developing an integrative framework, the social arena concept of risk debates, public wisdom and expert fallibility, error in risk assessment, the “acceptable risk paradigm” as a central pillar of expert self-delusion, managing low-probability events, and decision analysis in risk management. Concludes that the field of risk studies in general, and theory in particular, is still in its early stages. Research into cross-cultural views of global environmental change, in particular, is likely to “expand dramatically in the future.” A bibliography of about 750 titles is included. [NOTE: Thinking about risk is a narrowly specialized area of thinking about the future. The connection is seldom made, but ought to be.] **(risk studies field expanding)**

68

Improving Risk Communication. National Research Council, Committee on Risk Perception and Communication. Washington: National Academy Press, May 1989/332p/\$39.95;\$29.95pb.

Hazards of modern life surround us, as does communication about the risks of those hazards—a recently developed interest. But risk messages are difficult to formulate in ways that are accurate, clear, and not misleading. Some important misconceptions need to be dispelled; in fact: 1) there is no single overriding risk problem, and thus no simple way of making risk communication easy; 2) many people (including scientists and decisionmakers) have unrealistic expectations about what can be accomplished by risk communication; 3) good risk communication cannot always improve a situation, but poor risk communication nearly always makes it worse; 4) several kinds of legal considerations (statutory mandates, liability, informed consent and “right-to-know” requirements) influence the options available to risk managers and thus the content of their messages; 5) risk communication is not simply one-way messages from experts to an uninformed public; rather, it should be seen as an interactive process of information and opinion exchange among individuals and groups—an essential part of communication in a democracy.

Four generic issues have been the source of difficulty in the past: 1) relating the message to the perspectives and technical capacity of the audience; 2) handling uncertainty (“risk messages and supporting materials should not minimize the existence of uncertainty; data gaps and areas of significant disagreement among experts should be disclosed;” some indication of the level of confidence of estimates should be made); 3) risk comparisons can be helpful, but there are pitfalls when risks of diverse character are compared; 4) ensuring completeness (a complete message describes the nature of the risk, benefits from reducing risk, available alternatives, uncertainty about risks and benefits, and management issues).

Four key objectives in improved management of the process: **1) Realistic Goals:** risk communication activities should be a matter of conscious design, with practical goals and evaluation; **2) Openness:** organizations that communicate about risks should ensure effective two-way dialogue with potentially affected outsiders; **3) Balance and Accuracy:** to insure that messages are not distorted or appear to be distorted, managers should hold message preparers accountable and use independent outside review; **4) Competence:** preparation of risk messages should be a deliberate, specialized undertaking. [NOTE: Stated alternatively, this book is about communicating “possible futures.” ALSO SEE: **A Citizen’s Right to Know: Risk Communication and Public Policy** by Susan G. Haddin (Westview, Aug 1989; **FS Annual 1990** #9830), on citizen empowerment through accessible information, better analysis, and the means to participate.]

(risk communication)

69

Managing Disaster: Strategies and Policy Perspectives. Edited by Louise K. Comfort (U of Pittsburgh). Durham NC: Duke U P, April 1988/420p/\$58.00;\$19.95pb.

Essays originating from a 1984 Senior Executive Seminar on Emergency Management, cosponsored by the Federal Emergency Management Agency and the National Association of Schools of Public Administration and Affairs. Chapters discuss the emergency management system, restructuring problems of public action, natural hazard mitigation, implementing disaster mitigation policy, current policy in disaster preparedness, research-based disaster planning, Federal preparedness for hazardous and toxic waste disaster, management issues in emergency response, recovery following disaster, decisionmaking under the adversity of disaster conditions (by Yehezkel Dror), disaster management in the Netherlands, earthquake prediction and politics in Latin America, analytical tools in disaster management, ethical issues (e.g., warning the public of a probable catastrophic earthquake), and developing professional judgment to cope with conditions of uncertainty. Comfort concludes that the successful reduction of risk requires both more informed public policy and more systematic education in disaster mitigation and management for public service

personnel. New technologies in information-gathering, processing, and monitoring of hazardous events now allow the concept of mitigation and management strategies previously not undertaken by public service agencies. This book marks a shift in the definition of responsibility for catastrophic events, which heretofore have been considered “acts of God” beyond the control of human decisionmakers.

(emergency management risk reduction)

F. Evaluation and Critiques

70

With Both Feet Planted Firmly in Mid-Air: Reflections on Thinking About the Future, Donald N. Michael (San Francisco CA; Emeritus Prof of Planning, U of Michigan), *Futures*, 17:2, April 1985, 94-103.

Overcoming the footless status of futures studies is a far deeper problem than that of closing the gap between theory and data about human behavior in turbulent times. At root the problem is epistemological, as clearly demonstrated by exposure to histories of ideas and societal change. All we have today are endless fragments of theory that “account” for bits and pieces of individual, organizational, and economic behavior. We have no overarching or truly interconnecting theories. There are many pasts, and innumerable ways of putting together the present. Since multiple pasts and presents make it impossible to bound events definitively as the containers of causes and effects, forecasts become questionable as to what is becoming what out of what. Nevertheless, the pronouncements of experts are useful because they are able to influence the definition of social reality others hold; this source of authority legitimizes the stories they tell. In the face of a turbulent and problematic future, a future study offers a protection against the unknown. This sense of comfort is further reinforced through logical methodologies using models, data, graphs, etc. Those who commission futures studies are reinforced in their sense of competence because they see themselves doing what rational persons ought to do to solve a problem. Yet, much more often than not, futures studies increase discomfort because they expose the problematic ramifications of the future. The complex and unavoidable interplay of rewards and threats with which futures studies face their creators and consumers can usefully be seen as storytelling—the age-old device by which humans have inspired, influenced, and engaged each other. What is being told in any futures study is a story, and it could be a richer story if it were accepted as such. Three methodological injunctions emerge from this vision of the responsible teller of stories about the future: 1) shared thoughts about the future should include acknowledgement of the problematic nature of the past and present from which the futures derive; 2) such thoughts should be accompanied by an explicit theory about the processes of social change; 3) all involved should be aware that thoughts about the future unavoidably engage both constructive and destructive unconscious needs. We should remember that each of us is a part of the story; “know thyself” is thus the most essential of all conditions for meaningful and responsible engagement when thinking about the future and finding one's way among the claims, distortions, and fantasies that each of us harbors in our unconscious.

(futurists as story tellers)

71

What We Have Learned About Forecasting and Planning, Roy Amara (President, Institute for the Future, Menlo Park CA), *Futures*, 20:4, August 1988, 385-401.

An adaptation of materials from IFTF's tenth annual **Ten-Year Forecast**, summarizing notable hits and misses. Twenty years of experience has resulted in ten “do's and don'ts”: 1) Don't be a vacuum cleaner, collecting every speck of information that comes across your field of view—rather, construct a set of lenses or filters to avoid infoglut; 2) Don't substitute error for uncertainty: some variables are more uncertain than others, and this must be acknowledged; 3) At times, lean against the wind and question conventional wisdom or turn a trend on its head; 4) Hedge forecasts with possible low probability/high impact surprises; 5) Look for breakpoints and discontinuities; 6) Focus on underlying driving forces; 7) Look for clusters of drivers; 8) Translate environmental forecasts into forms that have direct meaning for organizational functions; 9) Don't over- or under- estimate the rate of adopting some technologies; 10) Keep asking “So what?”

(10 do's and don'ts of forecasting)

72

Ethical Dilemmas in Forecasting for Public Policy, Martin Wachs (Prof of Urban Planning, UCLA), *Public Administration Review*, 42:6, Nov-Dec 1982, 562-567.

Forecasts can be made by politicians and prophets, but in policy-making those taken seriously for any practical purpose are likely to be produced by technical experts serving as staff or consultants to decision-makers. The political salience of many forecasts and the technical complexity of the forecasting process combine to create an important ethical dilemma for the forecaster. Forecasts supporting advocacy of particular courses of action are often demanded by interest groups or public officials. But many technical assumptions are required so as to make any forecast quite subjective. By choosing particular data or mathematical forms, many forecasts can be changed to transform increases into decreases, growth into contradiction, or gain into loss. These transformations can produce rewards or remove threats for those who accomplish them. For example, assumption drag—reliance upon outdated core assumptions, which result in a systematic tendency toward conservatism—results from avoiding criticism for going out on a limb,

following hunches, or departing from conventional wisdom. Another illustration is the question of public works, which often leads to overestimated demand and underestimated cost because, once a decision is made to build a project, low initial cost estimates will rarely kill it and additional money will always be found. Although forecasters are committed by training to a body of tools and techniques, they must also be loyal to their sponsors, and the options frequently boil down to serving an agency or leaving it. Many forecasts are thus statements of hope and intention, with analysts and politicians maintaining the fiction that they are value-free projections of trends. Few forecasters engage in blatant falsification, but many are subtly transformed from analyst to advocate.

(biases of forecasting)

73

Pseudoplanning, Paul C. Nutt (Dept of Industrial and Systems Engineering, Ohio State U), *Technological Forecasting and Social Change*, 25:2, April 1984, 91-108.

Poor process management, or pseudoplanning, is an important but unrecognized source of plan failure. Types of pseudoplanning include: 1) **What's the Problem**, when the sponsor fails to give a thoughtful problem diagnosis and the problem is misperceived; 2) **The Omnipotent Planner**, when planners have a pre-packaged solution for certain types of problems; 3) **Pooled Ignorance**, when a planning task force fails to represent key points of view or expertise; 4) **Do It My Way**, when planning is carried out to sanction the pet idea of a sponsor; 5) **Change as Given**, when plans are made without giving careful consideration to how required changes are to be made; 6) **Sciencism**, when analysis is stressed at the expense of search, synthesis, and the creation of new options and ideas.

(types of pseudoplanning)

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Great Planning Disasters (American Edition). Peter Hall (Prof of Geography, U of Reading). Berkeley CA: U of California Press, May 1982/308p/\$29.95;\$7.95pb.

First published in England in 1980, this edition has a new 27-page introduction by Hall, the editor of **Europe 2000** (Duckworth, 1977). Several case studies are described at length. London's third airport and motorways ringing the city are examples of negative planning disasters, where plans were abandoned. The Anglo-French Concorde, San Francisco's BART system, and Sydney's opera house are positive planning disasters, where plans were implemented and then felt to have been wrong. Two near-disasters are also described: California's new college campuses and Britain's national library. How could the decision-making process be improved? Hall recommends a sophisticated form of muddling through, or jointed incrementalism (Dahl and Lindblom), or mixed scanning (Etzioni). Planners would start by forecasting in a different way, scanning the whole environment (not focusing exclusively on the easily quantifiable elements) to try to identify factors that could undermine the traditional kind of forecasting exercise. Thus the decision to build a new road or start a new airport would be made on the basis of two concentric circles of evaluation: 1) the inner circle would comprise a narrow financial evaluation similar to that of a private corporation accountable to shareholders; 2) the wider circle would set this financial evaluation within a broad cost-benefit framework of externalities: the positive and negative effects of the investment on other people. Such an approach would have avoided most of the disasters described here. Concludes that there is a perennial tendency on the part of politicians to think that planning problems will go away, but they don't. Doing nothing, and hoping Micawber-like that something will turn up, is as bad a solution as the grand slam that goes wrong. If the grand slam was the fashionable mistake of the 1960s, doing nothing is surely destined to be that of the 1980s.

(avoiding planning disasters)

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Great Expectations: Why Technology Predictions Go Awry, Herb Brody (Senior Editor, TR), *Technology Review*, 94:5, July 1991, 39-44.

No one can predict the future with pinpoint accuracy, but the technology forecasts of experts often amount to a chronicle of wildly missed cues and squandered opportunities. Some guidelines to avoid costly and embarrassing mistakes: 1) discount predictions based on information from vested interests (rosy predictions often originate with people who have a financial stake in a new technology, and are hyped by the business press on the lookout for hot trends); 2) watch developments in related fields; 3) expect existing technologies to continue improving, and don't expect people to abandon what they have for something new that is not substantially better; 4) beware of predictions based on simple trend extrapolation; 5) distinguish between technology forecasts and market predictions; 6) pay attention to the infrastructure on which success of a technology depends. Rather than predict a single outcome, SRI's Ian Wilson recommends that forecasters should paint several scenarios of the future, each hinging on different assumptions. [NOTE: A brief primer on technology forecasting.]

(basic guidelines for tech forecasting)

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Megamistakes: Forecasting and the Myth of Rapid Technological Change. Steven P. Schnaars (Associate Prof of Marketing, CUNY-Baruch College). NY: The Free Press, Feb 1989/202p/\$19.95.

Many forecasters paint a bright future for new, emerging technologies which, they claim, will spawn huge growth markets and

play a large part in our everyday lives. Most of these forecasts fail because forecasters fall in love with the technology and ignore the market it is intended to serve. For example, of 66 selected forecasts from TRW's 1966 "Probe of the Future" (published in *The Futurist*, Oct 1967), nearly every prediction proved wrong (e.g. a solar power plant in space by 1983, mass-produced low-cost modular housing by the 1980s, and personal vertical takeoff aircraft by 1977). Among 100 technical innovations "very likely in the last third of the 20th century" in Kahn and Wiener's *The Year 2000* (Macmillan, 1967), only about 15% of the forecasts were clearly correct, another 10% were partially correct by a lenient measure, 25% could not be evaluated because they were stated vaguely, and about 50% of the forecasts were clear-cut mistakes. A wide variety of other technological forecasts are examined, concluding that only 20-25% of such forecasts come true.

Chapters discuss the optimistic bias of most technological forecasts, gee-whiz forecasts of life at home in the future, the Zeitgeist effect (whereby forecasters are imprisoned by the spirit of the times in which they live, thus casting doubts on the merits of consensus forecasts), mistaken demographic trends, successful forecasts, and insights on growth markets (invention does not always lead to commercial success, ultimate uses are unforeseen, growth takes longer than expected). Concludes with three general guidelines for improved accuracy of growth market forecasts: 1) avoid technological wonder: do not be swept away by grand visions; 2) ask fundamental questions about markets (who are the customers, how large is the market, does the innovation go against customs and culture, etc.); 3) stress cost-benefit analysis: whether the product provides something special at a price both customer and manufacturer will accept. Insofar as forecasting methods, Schnaars advises to "stay away from anything that includes advanced mathematics," be suspicious of trend projections, challenge assumptions, and use multiple scenarios. [NOTE: A popularized assault on largely popularized and older forecasts. For a more scholarly treatment of the foibles of techno-optimism, see **Imagining Tomorrow: History, Technology, and the American Future** (MIT Press, 1986).]

(technological forecasting 20-25% right)

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Psychological Pitfalls in Forecasting, Jonathan St. B. T. Evans (Reader in Psychology, Plymouth Polytechnic, UK) *Futures*, 14:4, Aug 1982, 258-265.

Biases may operate at every stage of forecasting: people may perceive imaginary patterns in random events, ignore base rates in the presence of specific evidence, generate predictions which are least likely to falsify their own theories, and maintain beliefs in the face of contradictory evidence. These errors of intuitive judgment can be ameliorated to some extent by the use of formal procedures. Intuitive biases are most likely to operate when 1) there is much uncertainty; 2) the situation is very complex, with many possible relevant factors to be considered; and 3) when strong beliefs are held about the theories used to make forecasts.

(biases in forecasting)

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Why Were We Surprised? W. R. Connor (Director, National Humanities Center, Research Triangle Park NC), *The American Scholar*, 60:2, Spring 1991, 175-184.

It seems that no one foresaw the collapse of communism in the USSR and the East Bloc, developments in the Middle East, or the massive setback in China following the Tiananmen Square massacre. Mainline Western Sovietology has relied on a very narrow range of factors in its analyses—an economics that neglected context. The emotional context of economic and political change is precisely what has proved most difficult for many analysts. Cultural issues (language, schooling, freedom of expression, ethnic and national identity) are as central to political life as economic issues. But models of analysis persist in radically undervaluing cultural concerns. We badly need a fresh approach to understanding the world situation, one that is grounded in a serious study of culture and the nature of long-term historical change. Our repeated efforts to develop systems of prediction shield us from the true nature of our situation—a world of radical and essentially unpredictable change. Lavish expenditures on security studies discourages attitudes on which true security is likely to be based: an awareness of complexity, a respect for limits, and imagining the unimaginable. "In diplomacy, as in war, plans rarely work out as expected and ironic outcomes are to be anticipated." Such modesty may provide our best hope of survival. [NOTE: It is always valuable to reflect on who didn't see what major developments and why.]

(modest attitudes and attention to culture)

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An Evaluation of Delphi, Fred Woudenberg (Netherlands Environmental Health Service, Rotterdam), *Technological Forecasting and Social Change*, 40:2, Sept 1991, 131-150.

Reviews the history of Delphi and the literature on its quantitative applications, finding that "the main claim of Delphi—to remove the negative effects of unstructured, direct interaction—cannot be substantiated." No evidence was found to support the view that Delphi is more accurate than other (simpler, faster, and cheaper) judgment methods, or that consensus in a Delphi is achieved by disseminating information to all participants. Rather, consensus is achieved mainly by group pressure to conform. A total of 102 references are reviewed for this article.

(Delphi technique questioned)

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Public Sector Use of the Delphi Technique. John F. Preble (College of Business and Economics, U of Delaware), *Technological Forecasting and Social Change*, 23:1, March 1983, 75-88.

Reviews more than 100 Delphi studies conducted in the public sector and readily available through library services and government publications. (Many Delphi studies are proprietary and thus unavailable for examination). Special emphasis is given to the use of Delphi in public budgeting and education, and as a communications tool to address policy questions. Traditionally, the Delphi technique has employed the use of experts to arrive at a consensus on the likelihood and timing of specified future events. But it has also been found useful as a multi-purpose tool; some of the other principal uses include obtaining consensus among individuals, exploring diversity of opinion, acquiring "hard data" to communicate in planning, for curriculum and campus planning, and to identify and/or rank goals. Various modifications to the classical Delphi have also been made, such as structuring to encourage diversity and alternative options, evaluating options and events in relation to their desirability and feasibility, self-rating of participant expertise, and normative Delphis for goal formulation. A summation of the cautions when using Delphi, as noted by various authors, include the need to compare Delphi results with those obtained through other means of analysis, care in panel selection, susceptibility of statements to experimenter bias, and problems in distilling and consolidating written comments.

(overview of public sector Delphi use)

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The Electronic Oracle: Computer Models and Social Decisions. Donella H. Meadows (Dartmouth College) and J.M. Robinson (Dept of Geography, U of California-Santa Barbara). NY: John Wiley & Sons, May 1985/445p/\$39.95.

Promoters of the computer as a forecasting tool claim that mathematical models contribute greatly to the effectiveness, utility and equity of social decision-making. Their supposed advantages over the best mental models include rigor, comprehensiveness, logic, accessibility, and flexibility. But in practice, computer models have clarified and improved social decisions only in limited areas. Modelers ask why their models aren't used, and policymakers ask why models aren't made that they *can* use. The authors explore this problem, finding that some computer models are incongruent with the real world and/or with established thinking. Examines nine major models that were formulated as inputs to social policy: SOS (sponsored by the EPA), SAHEL and TEMPO II (sponsored by AID), LTSM and BACHUE (sponsored by the UN Fund for Population Activities), MEXICOV (sponsored by Mexican private businesses), CHAC (sponsored by the World Bank and Mexico), KASM (applied to South Korea), and an unnamed model used by Resources for the Future. The primary conceptual predispositions underlying each of these models is explored, as are their institutional settings.

Concludes that computer models can potentially surpass mental models, but that they "typically hide extremely simple theories under heaps of numerical gadgetry." Their methodological paradigms constrain creativity and limit comprehensiveness as often as they lead to insight. And by limiting themselves to things for which numerical data are available, they ignore much of the real world. Few of the models produced exactly the results they were intended to produce, but they did create some unintended and sometimes surprising side effects. Numerous suggestions for improvement are arranged in three categories: 1) **Knowledge Problems:** need for bigger and more standardized data bases, more resources needed for gathering data, need to use more qualitative and intuitive information, etc.; 2) **Institutional Problems:** government and business should emphasize basic research, policymakers should have realistic expectations, universities should establish reward structures for interdisciplinary research; 3) **Practice Problems:** funders should resist financing large models, modelers should approach complex problems from the top down, modelers should focus more on problems than on what is measurable, funders should enforce documentation standards, universities should establish a clearinghouse for models and programs, models should be tested by an independent evaluation agency, governments or professional organizations should certify modelers rather than models. [NOTE: An authoritative critique.]

(computer models)

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