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ABSTRACT

First presented at a United States Department of Agriculture (USDA) conference on renewable resources, this material includes information and discussion on critical issues, policies, and future alternatives for natural resources in the United States.
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CHALLENGES IN RENEWABLE NATURAL RESOURCES

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*A Guide to
Alternative Futures*

United States Department of Agriculture

2

CHALLENGES IN RENEWABLE NATURAL RESOURCES

A GUIDE TO ALTERNATIVE FUTURES

This Volume Was Produced
for the
U. S. Department of Agriculture

by
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Including
Futures Conditional
and
Economizing Abundance

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"I AM GOING AWAY KNOWING THAT
I DON'T KNOW WHAT I THOUGHT
I KNEW ABOUT PLANNING FOR THE FUTURE"

But

"THE NEW CONCEPTS I WAS EXPOSED
TO WILL IMPROVE MY UNDERSTANDING
OF THE FUTURE"

Participant in Conference

TABLE OF CONTENTS

Introduction by Bob Bergland, Secretary of Agriculture

General Introduction

I.	DRIVING FORCES	1
	Introduction	2
	Rich/Poor Country Tensions	5
	Past American Population Changes	9
	Migration Factors	13
	Ecological Balance	17
	Energy Resource	21
	Telecommunications	25
	Changing Knowledge Patterns	28
	Climate	32
II.	ALTERNATIVE SCENARIOS	35
	Introduction	36
	Status-Quo Scenario	39
	High*Technology, High Growth Scenario	44
	Low Technology, Low Growth Scenario	49
	Management Scenario	53
III.	FUTURE DISCOVERY TECHNIQUES	59
IV.	SOCIAL ISSUES	69
	Introduction	70
	Problem/Possibility Focuser Approach	75
	The Baby Boom Echo	88
	Styles of Education	89
	Levels of Morale	90
	Acceptability of High Technology	92
	Economic Systems	93
	Law or Mediation/Arbitration	94
	Decision-Making	95
	Are There Limits to Equality	96
V.	NATURAL RESOURCE ISSUES	101
VI.	BIBLIOGRAPHY	117
VII.	LIST OF THOSE ATTENDING CONFERENCE	118

FOREWORD

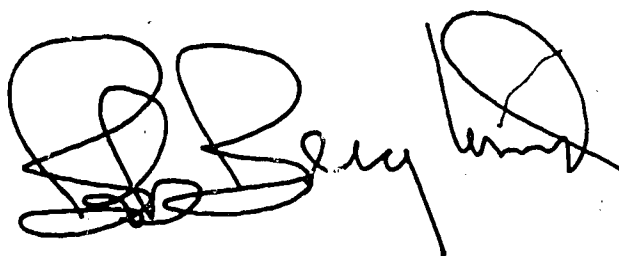
Challenges in dealing with renewable natural resources will tax the imagination of the U.S. Department of Agriculture to the utmost in the last decades of the twentieth century. We must learn to make creative decisions--and to encourage creative private decisions--within the context of a very rapidly changing society and economy.

In several ongoing studies through the Forest and Rangeland Renewable Resources Planning Act of 1974, 1977 Farm Bill, Soil and Water Resources Conservation Act of 1977, and Renewable Resources Extension Act of 1978, it has become apparent that we must begin immediately to develop the data and analytical methods needed to improve our capability for long-range natural resource strategies.

We organized a meeting in January 1979 to look at the future of renewable natural resources. We called together some of the most concerned natural resource people from within and outside USDA as well as some futurists. The purpose was to expand our understanding of the possibilities for the United States within a world context in the near- and long-term future. We began to learn about new questions, new problems and possibilities, and new trends. We learned that the Department must function in far more flexible ways if we are to deal with the uncertainties and extraordinary challenges of the next half century.

The conference ended with one firm recommendation: That more USDA personnel at all levels learn more about futures analysis and how it can improve current decisions. We have prepared this study guide for you about what went on at the conference--and some of what we wish had happened. It can be used by individuals or support a meeting. When you have worked your way through the material, and perhaps added your own, we hope you will be better able to understand why different people foresee very different futures.

I am personally convinced that those who are deciding on policy issues within USDA need to look at the broader and longer-run implications of their activities to become more effective. I encourage your response in helping improve this guide and all USDA decisions.

A handwritten signature in black ink, appearing to read "Robert B. Brey". The signature is stylized and somewhat cursive, with the first name "Robert" written in a larger, more prominent script than the last name "Brey".

REACTIONS TO GUIDE ON "FUTURE CHALLENGES IN RENEWABLE NATURAL RESOURCES"

Learning is most effective when it is an interactive process. We need your reactions to this guide to help keep it current and to maximize its usefulness to other readers. Please be as frank as possible, since we can learn from our shortcomings as well as from our successes. Entering your name and address at the bottom of this page is optional; however, it will allow us to contact you if we wish to follow up on any comments.

Please send to Administrator, Soil Conservation Service, P. O. Box 2890, Washington, D. C. 20013 as soon as possible.

My general reactions to the guide are:

I would like to see the following changes:

I am sending you the following material for your consideration in connection with further issues of the guide:

The guide might be used effectively in the following situations:

Name:

Address:

Telephone Number:

GENERAL INTRODUCTION

Comments

From January 22 to January 25, 1979 the USDA organized a conference on the Future of Renewable Natural Resources. It aimed both to increase general understanding within the Department about potential possibilities and problems in the next half century and also to enhance USDA's capacity to meet specific legislative responsibilities.

The reader of this guide needs to recognize that the conference was organized as an "experience" which would increase the knowledge and skills of those able to attend it rather than as a passive learning situation. Because of this approach, the three bureaus primarily concerned believed that part of the reporting of the conference should be designed to convey the nature of the experience.

This material is therefore designed to help individual readers, as well as people meeting in groups, examine their current views about the future, enlarge their perceptions about the possible directions in which America might move, reconsider the critical natural resources issues, examine how they can be effectively understood and to decide what policies would be most effective.

This is not a typical document. Reading it requires imagination and creativity for it uses a wide range of styles to force the reader to shake himself or herself free from the stereotype into which we all so easily fall. In one sense, this material is designed to help us break out of the conventional wisdom.

It follows, inevitably that this manual will not provide slick, final answers to the problems we presently perceive. Indeed, its goals are the opposite. We should learn that we will be constantly "surprised" and that unexpected events will almost certainly require fundamental changes in policy.

In effect, then, each user will be asked to consider new ideas which will often be disruptive of current hopes and beliefs. The first "natural" reaction to such material may well be rejection and anger. One of the generally agreed conclusions at the natural resource meeting was that we could not afford to continue these reactions. It also became clear that Americans must be enabled to gain a better sense of the broad range of alternative futures which lie before us. This is required if we are to prevent the secondary and tertiary results of our policies from warping or even negating our original intentions.

As you work through this material you will be becoming a particular type of "futurist," one who is convinced that our thinking, our decision-making and our patterns of activities affect the future. In fact, it is believed that the future we

Inherit comes into existence because of our hopes and fears and the actions that we take as a result of our perceptions. The future, according to this point of view, is largely created as a self-fulfilling and a self-denying prophecy.

In one sense, we are enlarging the scope of a saying for young people: "Be very careful what you want, you may get it." Today, we need to recognize as a society that "we must all be careful what we want for we may indeed get it." Do we really want what we say we want and, even if we do, is what we want feasible? Further, is what we want as individuals and as a society compatible?

Even these questions may not push us far enough. Today, the views of various groups in the society are so contradictory that no effective decision-making is possible. Each group, in addition, is so certain of the disastrous consequences which will follow if their particular approaches are not accepted, that they are prepared to disrupt the decision-making processes at all levels in order to make sure that their views prevail.

We have no shared vision about what is feasible and desirable. We are rapidly losing our belief that it makes sense to work with others to discover the root causes of our disagreements. We face the situation described by the poet:

"Things fall apart, the center cannot hold.

Mere anarchy is loosed upon the world." - W. B. Yeats

We can see this report as a way of "contexting" reality. Most citizens today are thoroughly confused by the endless, repetitive, contradictory stream of information which reaches them about contemporary issues. More and more people are giving up the attempt to understand the world in which they live, seeing this task as impossible. The material here tries to illuminate the disagreements which exist among those who try to think about the future and its prospects.

One further point may need to be made. Most sets of policy proposals, and future-oriented computer games and simulations, try to state what should be done but efficiently hide the assumptions, complexities and compromises inherent in the proposals. This material, on the contrary, aims to clarify the overall picture and to enable the eventual resolution of disagreements about renewable natural resources.

To avoid disappointment, you should know what this manual will not do. It contains no rules of thumb, no magic panaceas which will lessen the need for intelligent decision-making. On the other hand it should enable individuals and groups to focus

more effectively on the ways in which priorities for both thought and action can be established.

This effort will be successful if it leads to new ideas and to an increase in creativity. It is therefore based on a set of ideas about how people learn, which are set out with extreme brevity here.

Effective learning always requires an understanding of the context. Place most Americans in the middle of Tibet in the freezing winter and they may die rather than cope. Place most Tibetans in Manhattan and the result is likely to be equally disastrous. One can only learn if one has understandings which can be tied to new patterns of thought and action.

The ideal climate for fundamental learning develops when bright, intelligent, open people are brought together with each other in a well-designed "psychic space" which encourages new thinking and breaks through the barriers to communications. This ideal climate is difficult to achieve in many cases, and learning aids like the material presented here can remind people of ideas which may start the flow of creativity. These guides should be abandoned whenever they stop helping and start hindering the creative juices.

Such open communication processes can stimulate new thinking for individuals and the group. They can eventually lead to ideas that are either unusual or actually new within the culture and cause individuals and institutions to change their patterns of decision-making.

Creativity, however, is not a tidy pattern and one does not invent to order. Ideas which emerge from open processes will often force new directions on the individual and the organization for it will become clear that the meeting of fundamental societal goals requires new means. Thus there will always be resistance to opportunities for creativity by those who are so immersed in day-to-day crises that any new input will overload them and make them less effective.

Nevertheless, the problems and possibilities of the present moment seem to be so critical that there appears to be a willingness to consider new directions.

ORGANIZATION OF REPORT

It may be helpful to gain a quick overview of the organization of this guide.

The first section is set out as a series of brief reports to the President of the United States. Each of these reports takes

up one driving force which will continue to affect events strongly throughout the rest of this century regardless of what may be done by policy makers. These driving forces are written for conditions in the United States - although they are generally relevant for the other rich countries.

The second section of the report sets out several scenarios for the directions in which America may move in coming decades. It should be stressed that these are not prophecies which are expected to come true in detail. Rather they are ways of helping you to think through what might happen and then to make decisions as to what you would want to happen. They are designed to challenge your thinking, not present necessities. Each of the scenarios is, of course, radically oversimplified. To get a full sense of what might happen in any possible future requires, at the very least, a full length book.

The third section of the report provides some "future discovery techniques" and other approaches which you can use personally, or in a group, to enlarge your capacity to think in new ways. Many of you will have experienced such exercises as "lateral thinking" which are designed to help break through our conceptual limitations.

The fourth section is designed to show the range of possibilities for specific social issues given different emphases in the society. The pressures on the natural resource base, for example, are going to be very different in a society which opts for a high-growth and high-technology future as compared to issues which will emerge if we opt for far lower rates of growth in a decentralized society.

Similarly, the American economy will evolve very differently in varying possible futures. We have become so used to our commitment to full employment that we no longer examine the costs of this commitment or its feasibility over the long-run. This commitment may well have to be reconsidered in the immediate future.

The fifth section examines some of the critical natural resources issues. These range from very specific concerns for ensuring the availability of appropriate land for various purposes to looking at the management methods which are used to make natural resource decisions.

The final section provides the briefest possible bibliography.

We have used a loose-leaf format so that you can insert clippings, reports, etc. which you believe will help you to understand

these problem/possibilities more clearly. If you would send us a copy of what you think is important, it may help us to increase our comprehension above and permit us to continue to develop the manual.

PART I

D R I V I N G F O R C E S

INTRODUCTION

It is often assumed that the world can continue to evolve in much the same directions as it has throughout the industrial era. It is argued that no sharp breaks in trend are necessary. Indeed, this is the model which lies behind most of our planning where we take present trends and extrapolate them into the future.

The polar opposite of this view is that the trends which were created in the industrial era are today so destructive and uncontrollable that we cannot avoid a disastrous collapse in the world socioeconomy. Those who think in this way argue, in effect, that we are about to go over a cliff, that the momentum is so great that there is no way to avoid going over this cliff, and that we need to prepare ourselves so that part of the society will be able to pick up the pieces and move forward.

What are the driving forces which are leading some people to perceive the need for changing policies? Why are a growing number of thinkers coming to believe that we need very fundamental change in this generation and the next if we are to survive? Are we merely suffering from millenniumism - a "disease" which attacks us as we end each thousand years and makes us conscious of our mortality and the risk of change? Or is something fundamental really happening which makes it reasonable to look at change in a new and different way?

The material in this section tries to help you to deal with this issue by setting out some of the primary driving forces which are operating in the society at the present time. In order to make it easier for you to carry out this exercise, you should imagine yourself into the following situation: You are a member of the President's new futures staff working on American problems and possibilities. You have just received a memo from the head of your group which reads as follows:

"The material which follows represents the results of the work that we have done following the request of the President that we consider which driving forces are likely to be the most intractable in the next two to three decades. We are looking for those forces to which the United States must adapt because of a lack of control rather than those which the United States may be able to affect significantly through good decision-making.

"The President wants to meet with me next week to discuss these forces in the context of an effort he is considering to inform the American people of the new national and world context in which he is operating. We decided, as a group, at our last session that we would present no more than eight items due to the limited time that the President can give us and also our sense that we must not overload any eventual educational effort.

"The subjects that we have decided to include in this effort are:

"1. Rich/Poor Country Tensions - Obviously this problem is going to be a major part of the international context which cannot be changed. Because the President wishes to remain primarily within the domestic context for this effort, we shall not summarize the other international issues.

"2. Past American Population Changes - The 'bulge-in-the-snake' phenomenon is only now beginning to get the attention it deserves. Few people understand how significantly this will continue to disrupt the overall structure of the United States over the next fifty years.

"3. Migration Factors - The migration from north to south is now well established and will almost certainly continue for much of the rest of the century. The shift from urban to rural areas is only now taking hold and will, given people's desire to escape the cities, almost certainly be a significant force for two decades.

"4. Ecological Balance - The environmental consciousness which grew up in the nineteen-sixties, and burgeoned in the early nineteen-seventies, is now under increasing attack. The realities of the situation, however, are that any significant cutbacks in commitments to cleaning up our environmental problems will threaten the health and long-run safety of our population.

"5. Energy/Resource Availability - While it may be possible to obtain enough resources for a long time into the future, costs will be far higher. Increasing costs will force significant infrastructure shifts and it may well be impossible to maintain all the present capital stock. To take one example, the road and bridge situation is becoming critical in many parts of the country.

"6. Telecommunications - We have agreed that decisions about the level of technology are to a considerable extent cultural ones and will vary with American attitudes, there appears to be one exception to this rule. The technology of telecommunications will continue to develop rapidly because there is no real opposition to it at the present time, although different groups hope that it will be employed for different purposes.

"7. Changing Knowledge Patterns - The world both is more complex because of the greater speed and intensity of world-wide communication and it also seems more complex because we

are internalizing the idea that everything is connected to everything else. The management structures that will therefore work in the White House and elsewhere need to be re-considered.

"8. Climate - We have had many arguments about this issue with competent meteorologists and among ourselves. We have found no clear-cut evidence of heating or cooling trends, although the possibility of both are obviously present. But we have discovered that the climate in most of the twentieth century has almost certainly been unusually benign and stable, and this probably will not continue.

"I know that some of you still have other ideas that should be included.

"I would welcome your proposals for replacements of one subject with another. However, given our time limits I must get completed drafts from you. In completing these proposed documents, do not forget the distinction between driving forces and social issues which has confused us in the past. We are defining a driving trend as one over which there is likely to be relatively little policy control - a social issue as one where intelligent policy choices can be expected to have significant effect.

"I also need your suggestions for changes in the existing drafts. What should be taken out and what should be added?

"Finally, I hope that you will continue to develop your own personal scrapbooks of items that either are directly relevant to a driving force or throw a peripheral light upon it. You have your loose-leaf manuals available to you for this purpose and we are now developing computer linking techniques. The new ideas that have developed as a result of linking items which usually remain separate, continue to amaze me."

1. RICH/POOR COUNTRY TENSIONS

It is now almost thirty years since the well-meant efforts of the rich countries unbalanced the socioeconomies and cultures of the poor countries. Those working with the poor countries were appalled at the unnecessarily high death rates and decided to reduce them.

In some areas the decreases in the birth rate were almost incredibly rapid: for example, in parts of South-East Asia. In other areas, the decline was slower. But the results have been similar throughout the world and the gap between birth and death rates has been wide in most parts of the world for several decades.

The historical balance with both high birth rates and high death rates was thus broken. We are now in a position where, if major catastrophe can be avoided, rapid population growth will continue in many areas of the world for at least a further half-century.

WHAT COULD BE DONE?

There is increasing understanding that rapidly rising populations are gravely damaging development prospects in many parts of the world. But arguments about the most effective steps to take vary widely.

The conventional wisdom still appears to link the standard of living with desired family size and to argue that a fast enough rise in income can be achieved to cut into the rate of population growth. This model is based on a parallel with the patterns which developed in the countries now rich. The difficulty with this model, of course, is that we have been trying to raise standards of living over the last thirty years and we have only been successful in a few countries: it is not clear where breakthroughs will come in coming decades to ensure a better record and thus a reduction in birth rates.

There is an alternative school of thought about ways to control population growth which has considerable underground strength although it is not "respectable" and gets little public attention. This proposes that we set the "non-viable" countries adrift and leave them to shift for themselves. It is highly probable that this style of thinking will gain strength as problems get more acute. We believe that this concept should be resisted not only on moral grounds but also because systemic analyses of the consequences show that the effects of such a move could only be disastrous for the citizens and the interests of the United States.

The hard truth appears to be that we have not yet been willing to look honestly at the realities of the rich-poor split, how

long it will be with us and how serious it is. While there may be shifting alliances among the varying countries of the world over the next decades, as perceptions of national interest change, it seems inevitable that tensions between the rich and the poor countries will intensify for at least a decade.

THE CAUSES OF TENSIONS

Because the West sees the world in largely economic terms, western analysts created a new conceptual model following the OPEC embargo. They suggested that we should see the oil-rich countries and the other poor nations as totally different. The events in Iran should alert us to the fact that this split is all too often misleading.

The dominant force in many poor countries is not economic benefit but values and culture. The conflict of ancient vs modern is being seen in all its intensity in Iran: one of the primary splits may turn out to be between the "liberated" woman and the Ayatollah. It goes without saying that present differences build upon older tensions but in effect the fabric of the society is being torn in many directions. The classic revolutionary "steps" seem to be developing but at a far more rapid pace, presumably due to modern communications.

In effect, therefore, the influx of large amounts of money through the sale of natural resources may well speed up the process of culture shock rather than alleviate it. This implies that the countries on which we are relying for materials may well be the most vulnerable to cataclysm. This may have implications for national policy which are far deeper and wider than we have yet realized.

We must cease to attribute the causes of instability primarily to the machinations of other world powers. Events in the poor countries are not being driven by the communist/capitalist split but by "future shock." Only when we learn to get inside poor country realities might we be able to develop a set of tactics and strategies which are responsive to poor country needs.

ONE CLUE TO THINKING AND ACTION

We need to look closely at the process of cultural and socio-economic adaption which is now taking place in the poor countries of the world, and to do so in the context of America's changing needs.

In the fifties and sixties it was assumed that the development process of the poor countries would inevitably follow that which took place previously in the countries now rich. We have so far tried to convince the poor countries to learn and use the strategies which had brought us to our stage of affluence. Today,

we are beginning to be aware that rich countries have been moving in some wrong directions.

We now know that it may be possible for the poor countries to skip certain of the stages of growth which were necessary for the countries now rich. For example, it is increasingly suggested that communications may make the development of a very complex road transportation network undesirable and unnecessary.

At the cultural level, it is being suggested that both the agricultural era and the new era we are now entering require to be fundamentally cooperative. The industrial era, as we well know, has been competitive. We should work with the poor countries of the world to see how the cooperative structures they inherited from the past can work for them in ensuring the transition from the agricultural to the communications era.

"...the momentum of the long-term trend toward utilitarian, rational, industrial society would continue bringing us a future that would be a continuation of the past, but plagued with increasingly vexing social and environmental problems. A third dilemma confronts the technologically and industrially advanced world: We cannot risk the international instability that results from the vast disparities between the rich and poor nations, yet neither of the obvious solutions - making the poor nations richer or the rich nations poorer - seem feasible. The world probably cannot afford to have the gap closed through making the poor nations as productive, consuming, and polluting as the rich nations; at the same time, the rich nations are not likely to choose voluntarily to become less materialistic and more frugal. We often assume (with considerable justification) that the most probable future is a direct continuation of past trends. Yet it is apparent today that many long-standing trends cannot continue unaltered: World population cannot forever expand exponentially; world energy use cannot increase endlessly; patterns of world mineral consumption must change. In fact, it has been apparent for several decades that modern society has broken with the past in a number of important respects."

- Willis Harman, *AN INCOMPLETE GUIDE TO THE FUTURE*, 1976

"...the age of chivalry is gone. That of sophisters, economists, and calculators has succeeded."

- Edmund Burke 1729-97

"Our Western way of life is marked by excess--

*excess of consumption,
excess of accumulation,
excess pollution,
excess waste,
excess destruction,
excess armaments,
excess use of resources.*

*We are being made to expect too much.
We are taking too much.
We are scrapping too much.
We are paying, and compelling others to pay, too
high a price.*

*And so now we are saying
ENOUGH IS ENOUGH!*

*We call upon you to consider your resources and your
needs, your life-style and your stewardship and, to-
gether with us, to reshape our personal, social and
national priorities.*

*We ask you, together with us, to ask, again and again,
this question: Will this purchase, this change, these
plans make our relationships more fruitfully human in
the context of our own one human family?
Will this enrich or impoverish the personal values of
other people?
Will it clarify or cloud people's awareness of them-
selves as children of God?*

Do we still dare to ask such questions?"

*- Leaflet, based on John Taylor's 'Enough is Enough,'
circulated by a group in the United Church of Christ
in America*

2. PAST AMERICAN POPULATION CHANGES

The high birth rates of the late fifties and the early sixties are going to create major perturbations in the social and economic climate of the United States during the next fifty to seventy years. This result is certain although there is still great disagreement about what many of the impacts will be. One part of this briefing paper is devoted to this subject.

The second subject covered is the migration pattern from the poor countries to the rich caused by differential birth rates and major variations in standards of living.

THE POST-WORLD WAR II BABY BOOM

Births peaked at 4.3 million in 1957, were 3.5 million in 1968 and have been in the range of 3.1 to 3.2 million for the period from 1973 to 1976. Regardless, therefore, of future birth rates, which could rise significantly, there will be major consequences from what has been called the bulge-in-the-snake - the large population cohorts born in the late fifties and early sixties as compared to the figures for earlier and later years.

Up to the present time, the major impacts have resulted from the decline in school-age children. Many schools have closed, teachers find it increasingly difficult to get jobs, there have been considerable increases in juvenile crime, unemployment rates among young people are, today, very high, etc.

Colleges are just beginning to be impacted by the decrease in the size of population cohorts. Many believe that a significant number of colleges and universities will close in the eighties. Indeed, there has already been a significant, "unexplained" drop in enrollments - this is felt by some analysts to reflect a growing disenchantment with education in terms of providing job-skills and effectiveness in preparing people for the world in which they will live.

What will happen as the bulge in the snake moves onwards? During the eighties, the largest population cohorts will be in their twenties. From the optimistic point of view, this will lessen the need for additional jobs, will decrease juvenile crime, will increase productivity as people get used to the world of work. But there also are likely to be "unexpected" results: primary among them will be the extraordinary difficulty of providing well-trained and educated people with tasks worthy of their skills. The consequences of this underemployment can only be guessed at today, but it must surely increase job-related tensions. The efforts of women and ethnic minorities to secure good jobs is already seriously threatening white males. The issues which surfaced in the Bakke case must necessarily become evermore difficult to manage. These difficulties will increase still further in the nineties and the first decade of the twenty-first century.

Not until the third decade of the twenty-first century, shall we face the problem of a population which has an unusually large number of old people.

Indeed, the short-run problem of the aging of the population has been greatly exaggerated unless there are breakthroughs in the area of longevity. Looking at the range of Census Bureau predictions, the proportion of people over 65 will only rise from 10.7% at the present time to a range of 11.3% to 12.9% in the year 2000. On the other hand, there will be a substantial shift in the average age of the population from 29 years now to a minimum of 32.5 and a maximum of 37.3 at the same date.

If age-specific birth rates should hold constant over the next decade, there will be a substantial rise in total births in the eighties. How large an increase will develop depends on cultural forces which lie outside the scope of this briefing paper. It is essential to remember, however, that the highest Census Bureau projection would result in a birth rate a full 1 million above the historical fifties peak. The median Census Bureau figure would bring us back to the 4.3 million range of the late fifties.

THE IMPACT OF IMMIGRATION - LEGAL AND ILLEGAL

It now seems reasonable to hope that the pattern of world population increase which started in post-World War II years as the rich countries helped the poor countries reduce the death rate, without dealing with birth rate issues and without anticipating the consequences, has reached its maximum percentage rate of increase. Unfortunately it seems impossible that the absolute rate of population increase has yet reached its maximum annual rate - only the development of war, famine, disease and pestilence on an extraordinary scale could alter this reality.

Given the gap in wealth between the poor countries and the rich, which will be maintained and reinforced by differential birth rates, there will inevitably be attempts by individuals to move into the rich countries, legally and illegally. The central and immediate problem for the United States is obviously the Mexico border. New dynamics will emerge as Mexico becomes an oil-rich nation. The prospect of a major crisis resulting from immigration over this border seems very great. There are peculiar secondary consequences of this situation - for example, the attempt to get an accurate census count for the United States will be immensely complicated by the fear of reprisals and related sets of issues. (The differential birth rates for various ethnic groups within the United States will also have a destabilizing effect on political patterns with "Spanish-speakers" expected to become the dominant minority.)

Given the fact that the rate of immigration, both illegal and legal, is now a significant factor in U. S. population dynamics,

there is clearly a need for a reexamination of what goals are feasible and desirable in today's conditions. The combination of the nineteenth century hope of "give us your huddled masses yearning to breathe free" with the actualities of today has resulted in muddled thinking, confused policy, and growing feelings of guilt. For example, and specifically, it will probably become technically feasible to "close" the Mexican border: should we do this?

"Now Nettie, not another baby is my peremptory command, two will solve the problem whether a woman can be anything more than a wife and mother better than a half dozen or ten even."

- Letter from Susan B. Anthony to Antoinette Brown, April 22, 1858

"The Green Revolution has not brought any significant respite from hunger and malnutrition in Asia. Despite a total of more than 50 million acres planted in high-yield varieties of rice and wheat, grain production fell to dangerously low levels throughout Asia last year."

"The main problem with the miracle seeds is that they are engineered to outperform native varieties only under the most favorable ecological conditions and with the aid of enormous amounts of industrial fertilizers, pesticides, insecticides, fungicides, irrigation and other technical inputs. Without such inputs, the high-yield varieties perform no better - and sometimes worse - than the native varieties of rice and wheat, especially under adverse soil and weather conditions."

"Even when the technical inputs are applied in sufficient quantities, certain ecological problems arise, which seem not to have been given adequate consideration before the seeds were 'pushed' out into the vast acreage they now occupy. Conversion to high-yield varieties creates novel opportunities for plant pathogens, pests and insects. The varieties also place unprecedented stress upon water resources...."

"Of course, every man-made technological disaster has its man-made technological solution. But the peasant smallholders of Asia cannot meet the costs of spiralling technical inputs needed to avoid disaster. The Green Revolution inevitably widens the gap between landowners who have the credit and the know-how to keep up with technological solutions and the peasant small-holders who stand to lose their land when the unanticipated ecological side effects appear."
- Marvin Harris, Anthropologist

"THE POPULATION PROBLEM - CIRCA 1974"

"Given the changing role of women in society people expect them to have a career. But many women find they

have no economic or other incentive to develop a second career after their children are out of the nest, and so, for a few, having another child is a career. For that kind of parent sometimes there's a real need to help the child free himself from that parent's terrifically child-oriented involvement with him."

- Janece Kline, Pre-School Director

3. MIGRATION FACTORS

A basic sociological theory argues that massive migrations are often one of the primary causes of dislocations in a society. According to this thesis, the migration from the rural areas to the central cities and from the central cities to the suburbs in the forties, fifties and sixties has created serious disequilibria which we are still trying to resolve.

Many federal government policies are directed to managing the sets of problems which resulted from these past migrations. Large amounts of money flow into the central cities in an attempt to cope with obviously critical problems. But too little has been achieved.

While the dominant demand of the cities is still for more money, some mayors and town managers are showing greater sophistication in terms of what might be really helpful. For example, some cities and states might be ready to accept less money if they could have more control over how it was spent. Similarly, the federal government is looking for ways in which it could work with communities to ensure that overall goals were met rather than specific program requirements.

NORTH-SOUTH MIGRATION

But while we concentrate on the effects of past migrations, some totally new trends are developing which are causing new stresses and strains which require far more attention than they are yet receiving. In recent years, the movement from the north to the south has grown so rapidly that magazine issues have been developed with titles such as "The New War Between the States." There is still considerable conflict not only about the meaning of the trends but also about the ways in which growth statistics should be interpreted. Northern states tend to argue that the income and resources gap between the north and south is almost closed and that there is now need for a more even-handed policy while the southern states argue that there are still major differentials.

It is our belief that we are in urgent need of a "non-conflict" model for this discussion. It seems highly probable that both the northern and southern states would benefit from measures which would begin to slow movement down. The costs to the north in the present situation are obvious. But the building and facilities costs to the south at a time of rapid increases in costs are also very significant. As a result, there is growing evidence of changes in power structure views about the desirability of growth in such heavily impacted states as Arizona.

EAST-WEST TENSIONS

Finally, we must point out the pattern which emerged in the last election. There was a profound split in attitudes between

the eastern and the western states. This split could be significantly aggravated by the fact that the resource base of the country is moving toward the west.

Further, the boom-town/boom-area problem must be expected to complicate policy making in coming decades. The need for considerable outside help in boom-town areas has been established but success in setting up institutional arrangements to help with needs has so far been limited.

URBAN-RURAL MIGRATION

The boom-town/boom-area problem is part of a far wider issue which is still largely unperceived by the American people and their policy-makers. During the seventies a very significant reverse flow from the metropolitan to the non-metropolitan counties has started. It is estimated that 3,000,000 people have moved into non-metropolitan counties between 1960 and 1976. This is the first time that such a development has been recorded in American history.

There is no agreement at the present time as to the significance of this trend or why it is happening but here are some reasons we have discovered as we have been studying the picture:

- According to the polls, Americans have wanted to leave the cities for a long time, today they seem to be acting in terms of their desires.
- The cities have become ever more expensive and the rural areas seem to promise lower living costs because it is possible to avoid building and other standards which are often more strictly imposed in the cities and suburbs.
- It is increasingly possible, using the new telecommunications technologies, to be effectively working in the knowledge industries in the rural areas. (This last factor is still probably a minor one but we believe that it is going to grow in importance in coming years with the extraordinary telecommunications breakthroughs which are inevitable.)

The harsh reality, however, is that without an order of magnitude increase in the amount of help that is made available within the rural areas, there will inevitably be major breakdowns in the capacity to govern them. There are a number of institutions which could be mobilized to help, such as the Cooperative Extension Service and the Land Grant Universities, but much work would be required to reorient and revitalize these institutions for a task of this magnitude.

VALUE SYSTEMS

In addition, and critically, we must not transfer urban styles to rural areas. The attitudes and values of the rural areas are still surprisingly different from those of the towns, and it is critical that new programs be designed to fit the real needs of the inhabitants of the non-metropolitan counties. Only a major creative and imaginative effort can hope to ensure gains rather than losses as the necessary help is provided.

Let us close with one example of the magnitude of the problems. It now seems almost certain that the statistical styles and patterns we use today are not effective even for the purposes for which they were designed. It follows that they are particularly inappropriate for the rural areas. We need to imagine and create totally new statistical patterns. Thus while there is a need for money in the rural areas, providing too much will simply attract a new breed of consultants rather than encouraging communities to start working with and for themselves, which is the only way that effective solutions can be found.

"The French Revolution's Declaration of the Rights of Man listed among innate and inalienable human rights the liberty to stay and to move freely. Vigorous political and economic liberalism removed the barriers against immigration and emigration ... together with other barriers to human activity."

- Encyclopedia Britannica

"We speak of today's America as still a society of mobility. It is. There are people moving up, down, and across hierarchies. People do move from one city to another, from one house to another, even from one occupation or sometimes one religious denomination to another. But ours is a special kind of mobility. Its special character is not remarked on because, we suppose, it seems to be totally natural. That character is of being fixed in a kind of partialized, exclusive unit before and after one exercises the right of mobility."

- Robert E. Agger

"This is a fascinating poll. This is a big vote for extreme caution on growth. People have been telling me for years that Arizonans are very environmentally conscious in the broad sense of that word. I still find that somewhat surprising."

"I've always thought that people here were hell-bent for growth at any cost, an attitude which I don't share, but

which I thought was the dominant attitude. While I do find it very surprising, I am equally glad to see it.

"I think I would read behind this, 'Look we're concerned about deterioration in the quality of life, of the things that brought us here in the first place. We know that growth is inevitable. We don't oppose it, but we're very skeptical about whether or not we can manage it any better than Southern California did!"

- Governor Bruce Babbitt, commenting on a poll replied to by 3,200 people in Arizona

4. ECOLOGICAL BALANCE

It is sometimes argued that the success of the "ecology movement" in the sixties could not have been anticipated because it cut across the basic drives of the American culture. But such a statement fails to understand that there has been, throughout American history, a desire to maintain the integrity and the beauties of the land. Many struggles between economic growth and ecological protection have been waged at various times in American history, and they have not all been won, by any means, by those supporting the most rapid rate of economic growth.

The pattern today is confused. Is the ecological movement fighting a rearguard action to preserve the gains it has won or are the public still solidly behind it? The polls are not helpful in answering this question for, depending on the types of questions which are asked, it is possible to prove anything that one wishes using various surveys.

Indeed, this question as it is posed is hardly worth considering. The correct policy question goes far deeper and is far more difficult to answer. We need to consider the points at which the environmental degradations associated with economic growth are so serious that they must be controlled.

It is already clear that conceptual errors have been introduced into the legislative process and that these will have to be reversed. The process of reversing past errors will be seen by some as an abandonment of the ecological cause. For example, the idea of zero pollution is simply infeasible for many products and processes - the only way to achieve it would be to shut down the process or product. (This same problem is now critical in the food and drug area where it is increasingly suspected that overdoses of (almost) any product will be carcinogenic.)

HOW IS BALANCE TO BE ACHIEVED?

How are we to balance the needs for production with valid ecological concerns? Today, we are coming to suspect that the "limits" beyond which irreversible environmental damage are caused cannot be determined scientifically but only through experience. For example, there are scenarios which suggest that major heating or cooling in the atmosphere would result from slowly growing concentrations of various pollutants or an increase in the heat generated by combustion. The point at which change would be triggered cannot be determined with certainty because we do not know (probably cannot know) enough about the earth's atmosphere to simulate the processes.

In considering these issues, we need to remember the reality of discontinuous functions in man-controlled activities and also in nature. One of the classic examples of a discontinuous function

occurs in connection with freeway flow. The slowing down of cars on the freeway is not a straight-line function connecting number and speed - rather there is a point at which a dramatic slowing takes place with the addition of a very small number of additional vehicles.

Natural processes behave in the same way. It follows that we must necessarily be cautious in our choices if we are to be certain that disastrous consequences will not develop. This type of thinking will necessarily be threatening and unacceptable to groups which argue that we should continue maximum rates of economic growth until we have resolved some of the most serious of our world-wide socioeconomic problems.

Any belief, therefore, that ecological concerns can be abandoned in this country and the rest of the world fails to understand fundamental ecological reality.

NEW FORMS OF CONFLICT RESOLUTION

If this is indeed true, then we are going to have to create significantly different models for conflict resolution. Today, federal legislation can be used to delay activities which are found objectionable by any specific group. The most obvious path uses the environmental impact statement but there are many other methods of bringing a particular project back and back for reexamination. This results in rapidly escalating costs which we pay as a society and individuals - they add significantly to the inflationary spiral.

We need fundamental rethinking. This should start from the statement that it is possible for the United States to meet the cost of the needed environmental programs. On the other hand, it is not desirable for the United States to pay the costs required by some legislation. In addition, citizens should not be forced to pay for the costs of continuous discussion and litigation.

Our essential problem is philosophical. It is still assumed by our legal and political processes that society can gain enough knowledge to create an absolutely correct decision. Thus, each time a new fact or piece of data emerges, it is assumed that this implies that the "correct" decision may not have been reached. Obviously, given bad faith on any side, the situation rapidly becomes intolerable.

We need to develop a fundamentally new pattern for making decisions about difficult, controversial and potentially damaging questions. We need to find ways to draw together all those who are affected by and have skills to help resolve a particular situation. We must then make decisions on the basis of the best information that is available at a particular time. After the decision is made, there would then be an extremely strong presupposition

that the issue had been closed. Reopening should only take place with an extraordinary strong justification and the rights of those who acted on the assumption that a final decision had been made should be respected and, if changes are made, there should be compensation. Such a model would begin to restore some stability to directions.

We are, of course, suggesting very significant changes in legislation, thinking and values. But we believe that there is now sufficient evidence about the costs in time, and in individuals' and institutions' willingness to commit themselves to significant activities, that changes of this magnitude are urgently required.

We are not suggesting here that the scales should be tilted toward or away from economic growth or toward environmental balance: this is a far broader issue. We are only suggesting that it is in the interest of all of our society that we find ways to reintroduce some certainties into our political and socioeconomic system.

"This we know.

"The earth does not belong to any man; man belongs to the earth. This we know.

"All things are connected like the blood which unites one family. All things are connected.

"Whatever befalls the earth befalls the sons of the earth. Man did not weave the web of life, he is merely a strand in it. Whatever he does to the web, he does to himself.

"This we know."

- Chief Seattle

"In today's world all curves are exponential. It is only in mathematics that exponential curves grow to infinity. In real life they either break down catastrophically or they saturate gently. It is our duty as thinking men to strive toward a gentle saturation although this poses new and very difficult problems."

- Dennis Gabor, 1971 Nobel prize winner

"The main problem is that, in view of the political immaturity abroad today, it is unlikely that mankind will earn survival without a major disaster. If we are more realistically optimistic, we can envisage that in the next 200 years the oceans will be a disaster -- today even the remotest beach has patches of oil on it. The continents will be devastated, and only 100 million human beings will still be around on Earth. The main terrestrial life form will be insects."

- Jacques-Yves Cousteau

"This means that there has to be give and take. We must realize the importance of communication and of understanding each other's social, economic, and political differences. We must share an awareness of the need for balance as we consider what the future will be.

"When we talk about economic development we think of balance. We know we don't want to scatter smokestacks across our state, jamming our open spaces that make us so attractive now. But we know that people cannot enjoy open spaces without jobs provided by economic development.

"When we talk about energy policies we think about balance. We believe we have a potential with our resources to become less dependent on outside sources for energy. But we are not going to recklessly pollute our air or rip up any more topsoil to meet what has become an almost insatiable energy appetite. We see the need for a balanced transportation system and are working on it."

- Robert D. Ray, Governor of Iowa

5. ENERGY/RESOURCE AVAILABILITY

One of the most confusing and heated arguments of the present time is about the availability of energy and resources. Part of the problem emerges from different estimates of the amount of minerals, etc. in the ground. More critical, however, is the different conceptual models that are used.

On the one hand, there are people who argue that we have always managed to find reserves when we need them and that it is therefore reasonable to expect that we shall continue to do so. On the other hand, others state that it is inevitable that we shall be forced to use lower and lower grade resources and that, as a consequence, costs will rise. Eventually the costs of extraction would, according to this model, exceed the benefits.

This debate can fortunately be resolved using basic economic theories which have been around for over a century. The British economist Ricardo proved that land economics and product economics are not the same and that it is a major error to treat them as though they are.

DIFFERENCES BETWEEN PRODUCTION AND RESOURCE ECONOMICS

In normal supply and demand economics, when a product becomes scarcer, the price rises. This increase in the price then increases the attractiveness of creating more of the product and after a short or long lag, the consequent increase in supply will normally bring the price down again. Whether the new price, after the change in demand, is higher or lower than before depends on complex interrelationships between the elasticities of demand and supply. It is, however, almost certain that the short-run rise in the price will be larger than the long-run rise.

In today's conditions where prices are largely controlled, supply and demand patterns work less freely than in the past because fewer goods and services are subject to market prices. But the basic tendencies remain and it is always true that an attempt to force a price above the "equilibrium level" will cause counter-acting forces to develop, both as people buy less of the product, and as others try to find ways to supply it or to invent alternative goods and services which can substitute for the need.

Most economists and businessmen seem to consider that the energy and non-renewable resource situation is similar to that which exists for goods and services. To a certain extent this is true: there will be decreases in demand and increases in supply as the price of a non-renewable resource does rise. For example, some analysts point to recent changes in the price of copper which rose to such a level that it made it attractive to mine different types of ore. This caused a slump in prices from which we are only now emerging.

It is this pattern on which Norman Macrae of the Economist, and others, rely when they forecast a glut in energy supplies in the eighties. They suggest, that the activities of a large number of people, all considering their own self-interest, will cause a fundamental change in the situation. It would indeed be unwise to ignore this aspect. For example, new technologies seem to promise very large increases in gas mileage and very large increases in the capacity to recover oil from wells which previously yielded slowly or were no longer yielding at all.

Paradoxically, however, real successes along these lines might be the worst thing that could happen for the long-run survival of the human race on this planet. This is where we have to look at economics more carefully.

LAND AND RESOURCE ECONOMICS

The key point made by Ricardo was that the supply of land was finite. He was aware that a small amount of land could be added to the stock and that the efficiency and effectiveness with which land was used could be changed. But in the main, he argued, the amount of land available could not be significantly changed.

Thus, he pointed out, when the demand for land went up, there was no chance of any significant increase in the supply. The increase in demand would therefore inevitably push up prices and the payments to land owners would increase more rapidly than the amounts of money available to labor and capital, the two other factors of production.

This pattern has, of course, been developing throughout the world. In Japan, for example, the prices of all land has reached "fantastic" levels. Costs have also been increasing in the United States recently and, indeed, in all the rich countries. There is, as a result, an increasingly popular theory that one of the primary causes of inflation is the very significant rise in land prices throughout the world which then become incorporated in all other prices.

How does this theory relate to the resource issue? Non-renewable natural resources behave similarly to land in economic terms. It is for this reason that many of those concerned with resource use are arguing that we should immediately take steps to limit usage so that those generations which come behind us will have the maximum opportunity not only for survival but for living in the best possible conditions. These arguments have so far not dominated our socioeconomic debate.

One of the reasons for the lack of acceptance of these ideas is that they challenge deeply rooted behavior patterns, but it should also be noted that there is an intellectual rebuttal. It

can be argued that we shall become intelligent enough to find totally new types of resources such as "anti-gravity," the ability to use the sun directly, etc. It is then stated that we both can and should use the now-useful resources of the earth prodigally at this point so that we can build a "bridge" to the period when we have become "gods" and are able to set up a high-level self-sustaining socioeconomic system on earth.

There is no effective way to compromise between the various arguments which are advanced by different groups for they emerge from completely opposed visions of the way the world works and should work. As you may know, people are writing fundamentally different scenarios for the future based on these varied views. One possible technique for any conference that you might want to convene would be to challenge people to think about the directions in which the United States can and should move in the next half century.

"We are the ciphers, fit for nothing but to eat our share of earth's fruits."

"It is not the possessor of many things whom you will rightly call happy. The name of the happy man is claimed by him who has learnt the art wisely to use what the gods give..."

- Horace 65-8 B.C.

"This statement is written in the recognition that mankind is at a historic juncture which demands a fundamental re-examination of existing values and institutions. At this time three separate and mutually reinforcing revolutions are taking place:

"The Cybernation Revolution: A new era of production has begun. Its principles of organization are as different from those of the industrial era as those of the agricultural. The cybernation revolution has been brought about by the combination of the computer and the automated self-regulating machine. This results in a system of almost unlimited productive capacity which requires progressively less human labor. Cybernation is already reorganizing the economic and social system to meet its own needs.

"The Weaponry Revolution: New forms of weaponry have been developed which cannot win wars but which can obliterate civilization. We are recognizing only now that the great weapons have eliminated war as a method for resolving international conflicts. The ever-present threat of total destruction is tempered by the knowledge of the final futility of war. The need of a "warless world" is generally recognized, though achieving it will be a long and frustrating process.

"The Human Rights Revolution: A universal demand for full human rights is now clearly evident. It continues to be demonstrated in the civil rights movement within the United States. But this is only the local manifestation of a world-wide movement toward the establishment of social and political regimes in which every individual will feel valued and none will feel rejected on account of his race."

- Ad-Hoc Committee on the Triple Revolution, 1963

"Consider the Ferret -

"The Black Footed Ferret, whose last stronghold is South Dakota, is unable to exercise any control over its environment and is on the decline. Tilled fields have displaced the once superabundant prairie dogs which are the ferret's prime food resource.

"Some energy resources, once thought limitless, now have known exhaustion dates. The dates may be years in the future but nevertheless have a grim finality. It is up to us, mankind, to exercise control and make the most efficient use of our resources together. Efficient use slows depletion ensuring that economical alternative energy production methods for electricity will be ready well in advance of the time existing fuel sources are exhausted. In the Black Hills we have an adequate supply of energy to use, even to share, but none to waste . . . use what you need efficiently."

- From an advertisement series by The Black Hills Power and Light Company

"There is endless merit in a man's knowing when to have done."

- Thomas Carlyle

6. TELECOMMUNICATIONS

Throughout the post World War II years, the drive toward microelectronics has continued with remarkably little societal attention to its short-run and long-run effects. Microelectronics will clearly be one of the most important and critical driving forces in the United States and the world over the rest of this century and into the twenty-first, although it is extraordinarily "invisible."

It may be revealing to look first at the reasons for the lack of visibility of this force which has already transformed our lives through the hand calculator, the computer and the growing flexibility of communications systems. What has hidden the effects of this extraordinary force from the general public?

Issues of Science and Scientific American published in the last two years both commented on this relative invisibility but failed to explain the reasons for it with any great success. Here are two possibilities. First, we are used to perceiving change in terms of buildings and structures but the very nature of the telecommunications revolutions limits the need for structures. In fact, the development of fiberoptics, microwaves and satellites is making the cost and visibility of communications developments even less than in the past.

Second, and perhaps more critically, no group in the society has so far believed that its interests are severely threatened by the development of microelectronics. Different groups tend to look at the potentials it raises for them while ignoring many of the dangers. There have, of course, been some limited concerns about privacy and "big brotherism" but they have so far been marginal, although this situation might well change in the future.

Support comes from various groups for different reasons. Those who believe that high technology and high economic growth are the route into the future are convinced that only more sophisticated equipment, which must of course include computers, can permit the continued increase in supply which is essential. In addition, microelectronics is seen as the only way to increase productivity in many areas of the economy, particularly in "service" trades.

Those who believe that low technology and low economic growth are the route into the future do have some limited fears about computers but this is not normally a priority issue for them. Indeed, the conserver movement is itself divided on this subject: there are a very large number of people who believe that the best way to cooperate between communities, and also permit individuals within communities to work together, is through a computer-based teleconferencing system.

Others believe that computers can improve management systems in very significant ways. This group is interested in the new styles for structuring knowledge made available through more flexible and cheaper computers and the connections between them.

PROBABLE DIRECTIONS:

We are doubtless going to see the rapid development of microelectronic technologies. The only certainty is that the consequences will be startling. For example, there is growing discussion of the paperless office, and while it may well develop less rapidly than is sometimes assumed, it will have a major impact on the consumption of paper by the end of the eighties.

Why is it so difficult to get a fix on the likely directions of the microelectronic "revolution" - for this is not too strong a word? In part, the problems emerge from the very speed of development in the field - there is a saying among those most closely involved that if you go away for a month you may well miss a generation of equipment. While this statement is exaggerated, there is an important grain of truth in it.

In part, the problems of analysis emerge from the fact that the microelectronics technology can be used for so many different purposes. For example, the home video recorder can be used for improving education and to support a wild explosion of pornography. The video disc and cable television, the more effective automobile and teleconferencing, the giant computer and the personal computer, - and much more - all stem from this explosion of knowledge.

It is for this reason that the discussions now going on in Congress about the future of the telecommunications industries - indeed the knowledge industries - are so critical. People have obviously not yet understood that the historical divisions between computers and telephones, television and home entertainment centers, cable and network television, are steadily being whittled away by the progress of technology. Attempts to prevent competition between these various areas through regulation are therefore doomed to failure, although they may cause considerable confusion. Similarly, the effort to preserve the monopoly of the post-office or the cable companies for the sending of messages is like Canute trying to hold back the tide - the primary negative result will be to slow down the emergence of technologies and styles of decision-making which would help to manage our present crises.

"The search for new ways of communication is another characteristic of the present. This development can

be considered peculiar to our abundance era; indeed, the situation develops because of a super-abundance of "information."

"This overabundance of information causes saturation; saturation then leads to blocking, and the blocking disorients the thinking of men and societies. These processes of blocking and disorientation are visible at both ends of the society. At the bottom, the question is posed in terms of the coherence (and even the existence) of societies which are no longer controlled by will and design but appear to have developed their own dynamic. At the top, the question is one of power - those holding it seem to vacillate between a belief that they can impose order and an understanding that they cannot control the system which has now developed."
- Georges Gueron, France

"The free flow of ideas worldwide is needed if mankind is to solve the approaching global crisis of increasing population, pollution and dwindling resources. Marshall McLuhan understood the pivotal position of media in our time before most of the rest of us did."
- J. Edward Murray

7. CHANGING KNOWLEDGE PATTERNS

In recent years, there has been increasing discussion of the ways in which fundamental changes in patterns of thinking and organization of knowledge take place. There is now widespread agreement that the process takes the following form:

Knowledge structures come into being because they are found effective at a particular time. Because no knowledge structure can be complete or explain all the phenomena that confront it, exceptions to the overall structure will inevitably be found. The knowledge structure is then stretched to accommodate the exceptions. As time goes on, the exceptions become so large a part of the total pattern that the underlying organizing simplifications with which the structure started are almost lost to view. At this point, the search starts for a simplified model. If and when this is created, it may be adopted with quite startling speed.

Alternatively, the ideas which could support a new model may remain "invisible" for a significant time before the society is willing to consider them seriously. In this case, as in all others where creativity is involved, the choice of the proper moment is crucial. For if the society feels that it can still get by with the old theory despite its flaws, it is unlikely to submit to the vast upheavals which will inevitably be forced by the introduction of a new knowledge structure.

One of the primary intellectual questions today is whether we are indeed undergoing what is known as a "paradigm" shift: i.e. a fundamental change in perceptions. More and more people argue that changes are taking place and that these profound alterations in thinking styles will be one of the primary driving forces in the society over the rest of the century. We agree with this belief, although we know that there are still strong voices raised against this conclusion.

What is the nature of this new paradigm? What will it imply for American and world society? This is one of the questions which the government should be considering at the present time if we are to have any reasonable prospect of avoiding world collapse and living well in the twenty-first century. In considering this question, however, we need to distinguish carefully between the understanding which is possible of the forces which are driving us and the results which will follow if these forces are able to work themselves out.

Let us use a physical analogy. It is now possible to state the vectors which are driving us and the directions in which we shall move. But we cannot hope to know what will be the final shape of the society once these vectors have worked themselves out.

We can set out a parallel with the evolution into the industrial era. There were, at the beginning of the industrial era, a limited number of people who perceived the driving forces which lay behind the industrial system and the directions in which society would change. However, practically nobody was able to perceive the types of social, economic and political models which would develop as a result of these forces.

What then are the central elements of this new paradigm and how do they differ from the fundamental understandings which underpinned the industrial era?

1. There is a growing understanding that "everything is connected to everything else" and that analysis of part of a system without consideration of its interconnections is extremely dangerous. This implies that the disciplinary pattern of understanding which underlies the industrial era is now a cause of very significant error.
2. There is a growing understanding that it is impossible to act in a system or even to observe it without altering it. This implies that the belief in an "objective" world, in which truths are absolute and unchanging, is now a cause of very significant error.
3. There is a growing understanding that all decisions involve the balancing of uncertainties and risks. Our present social sciences - which either ignore or minimize the consequences of risk - are now a cause of very significant error. (It is not generally known, for example, that conventional economics has no theory of risk at all.)

The new paradigm takes these three critical realities into account. The most important conclusion which emerges is that there can be no absolute and immutable truths. The truth can only be found by comparing and contrasting various perceptions of reality as seen by different people who have had different life experiences and therefore necessarily understand their world in different ways.

This pattern implies, in turn, that we must develop love/trust relationships and win-win systems. Such systems are essential because people will not dare to share their fragile visions of the truth with others unless they are convinced that they will not be laughed at or taken advantage of because of their statements. (It is for this reason that the decline in trust throughout our society has such crippling results.)

The implications of this new paradigm are much broader, of course. How does one develop and make available knowledge when we can no longer state absolute truths? What sort of documents and

knowledge systems are required when we admit that all we can do is to state partial and contradictory views as honestly as we can. These then serve as a basis for ongoing dialogue in our struggle toward the truth.

Many of those who do believe that we are in the middle of a paradigm shift argue that this implies that we live in an a-historical period. There have, of course, been paradigm shifts in the past, but the speed at which this paradigm shift must take place if we are to survive - i.e. within a single generation - is totally new.

Past paradigm shifts have taken place as the old have died off and the young, with new visions, have taken their places. The present paradigm shift will require each citizen to rethink his own hopes and fears for the future and to work with others to achieve the most favorable results for all those involved.

"I am not an advocate for frequent changes in laws and constitutions, but laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances, institutions must advance to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain ever under the regimen of their barbarous ancestors."

- Thomas Jefferson

"We must regard ourselves as transitional men, not men of the past. As transitional men we have a place--as a link between the age that is ending and the new, and often mysterious, one that we are entering. I believe we have the vital task of ushering in the new era. It is our task to make available those traditional values which future generations may need. We must not be hurt, however, if our values are sometimes rejected.

"Few generations are privileged to usher in a new age. The hunting tribes who first started farming were one such generation. The farmers first to form a city-state were another. The Renaissance commercial giants of Florence, Sienna and the Hanseatic League were another. The great industrialists of Britain's 19th century were another. Now we are challenged, in my opinion, to join these privileged of history. Only together shall we be worthy of our time in history."

- Patrick Hartt

"Can we diversify without becoming trapped in contradiction, build a pluralistic society that will be able to maximize personal development and move beyond material abundance? Can we construct a society that will respect all persons and their diversity, and will be able to cope with the coming crunch of population (six to seven billion by the end of the century)? These billions are the ones who will undertake a rethinking of philosophy, ethic, and organization.

"In hoping that humanity succeeds in this collective task, let us be cognizant of the risks we run and, calculating the effects of failure, pay careful attention to the conditions for success. Should wisdom and tolerance become practical civic virtues instead of being the exclusive property of "great" men? Does our future depend on this?"
- Georges Gueron

8. Climate

We have less to say on this subject than on other driving forces but we are so convinced of the importance of this question that we believe that it must be kept in mind whenever we discuss the future of the United States and the world.

We have had a large number of discussions with climatologists. There are at least as many theories as there are climatologists. These range all the way from close-in trend analyses to those that seem to partake primarily of science fiction. We have also taken note of the popularity of a recent novel which deals with the triggering of a new ice age, and we remain thoroughly uncertain that any one person or group knows the truth in this area.

It is obviously possible that man's activities could at some point be of sufficient magnitude to affect the climatic patterns on earth. On the other hand, it can also be argued that humanity's total efforts for the foreseeable future will be trivial compared to what the earth can do in terms of hurricanes, earthquakes and other similar natural patterns.

As one looks back at the geological record, it is, of course clear that there have been major changes in the world's climate over time. It is also clear that we have neither the knowledge nor the power to reverse such a major change if it should begin to develop. The more appropriate question with which we must deal is whether we can learn enough to avoid triggering a catastrophic alteration through our own actions. Our skills and knowledge are still so limited at the present time that the only possible intelligent decision would seem to be caution, wherever there is any evidence of significant danger. Questions of what we mean by "significant" and the ways to measure "significance" are controversial and will become more so: one example is the ozone layer issue.

Apart from these long-run "catastrophic" set of issues, there is one other climatological concern which deserves attention. There seems to be considerable agreement that the basic climate of the last fifty years, both in the United States and on a world-wide basis, has been remarkably stable and benign. In other words, there have been less extreme climatological events than the norm and the patterns of weather from year to year have stayed remarkably "stable." (It may be difficult to believe this statement because the weather each of us experiences often appears as a series of extremes.)

If the forecast of greater climatological variation is correct, there could be very significant problems in the near future. Agricultural innovation patterns of the twentieth century have concentrated on improving yields within narrow ecological niches: this pattern has worked only because the climate has fluctuated within a relatively narrow range. If there should be a major

shift, then the yield of many varieties of crops would drop precipitously because of the fact that they were so narrowly adapted to a specific ecological niche.

A similar problem might emerge with diseases and pests which could increase dramatically because of changes in climates. The mono-cultures throughout much of the United States could provide ideal conditions for propagation of such pests and diseases.

We suggest three actions:

1. Alerting the American people to the importance of the climatological issue, this might prove an ideal area for education. It would inevitably teach the complexities of decision-making, for discussions of climate inevitably require an understanding of probabilities.
2. Allocating enough resources for intensive discussions between the most competent climatologists in order to determine what are the reasons for their disagreements at the present time. Efforts should be made to broaden patterns of agreement and to narrow down the causes of disagreements. We are excited by the new patterns of knowledge creation and transfer which have been developed for these purposes.
3. Making sure that this subject is covered effectively in any conference which you may decide to call to consider driving forces.

"Like other nature-related risks such as earthquakes, our ability to predict climatic changes is minimal. Predicting any future risk is difficult at best, but in the case of climate, that difficulty is compounded by gaps in our knowledge of the workings of the climatic system.

"Left to her own devices, Nature will gradually slide into the next Ice Age. It is due over the next 10,000 years. But many climatologists believe that something unnatural may be happening on the way to the next deep freeze - and it is happening now, not in thousands of years from now. The peculiar factor influencing the climate is people, who through their industrial and agricultural activities are competing with natural processes that determine climate....

"While it is clear that very few of the questions about future climate related risks can be answered with precision, it is equally clear that some decisions cannot be

postponed until very precise information is available. One example is whether to continue burning fossil fuels. Such combustion, which produces carbon dioxide, (CO₂) will likely affect the climate....

"The menace of CO₂ lies in the fact that it tends to absorb infrared radiation, trapping some of the earth's heat which normally escapes to space. This has been dubbed the "greenhouse effect"; it is analogous to a greenhouse in which the glass allows solar heat in but blocks its escape to the outside.

*"The greenhouse effect of CO₂ could raise global mean surface temperature about 1°C by the turn of the century and by 2-3° by the middle of the twenty-first century. These seemingly insignificant changes are sufficient to disrupt the earthly heat balance and approach the magnitude of the average global temperatures from warm epochs to the Ice Ages!"
- Stephen H. Schneider*

PART II

A L T E R N A T I V E S C E N A R I O S

47

INTRODUCTION

This section of the guide is meant to help you imagine yourselves forward into the year 2000 and to contrast various different visions of the directions in which people expect the world to move over the next twenty years. You will find four contrasting views here: a status quo scenario; a high-technology, high-growth scenario; a low-technology, low-growth scenario; and a management scenario.

You may well find it difficult to imagine yourself forward twenty-one years into the year 2000. So let us start with an easier exercise.

Imagine yourself backwards to the year 1958. How much cultural shock would you experience if you were suddenly back in the late fifties? How would your present attitudes mesh with those which you would discover among people living at that time? Would you be generally uncomfortable or very comfortable? What values, styles, attitudes, of this earlier period would you find most attractive, which most destructive, which most hypocritical, which most "surprising"?

Before you start to imagine the future, take time to think seriously about time travel into the past. If you're working in a group, share your notes. You need to recognize the amount of change which has taken place in the last twenty-one years.

Once you have done this, you will hopefully feel more ready to deal with future changes. The four scenarios you will study in this section are all dated in the year 2000, only twenty-one years in the future. To bring this fact home, remember that the child born this year will celebrate it's twenty-first birthday and "come of age" in the year 2000.

Nobody can predict the future. These scenarios do not pretend to do so. There are different ways of reading and understanding them.

One way of looking at the material is as different documents which could be written by co-existing groups in the United States in the year 2000. This might at first sight seem absurd: however, if you read today's publications, it is clear that people and groups observe the "same" reality and come up with totally different perceptions about what is actually going on, let alone what should be done to improve the directions of the culture.

Another way to look at the four scenarios is to consider them as the outside limits of the probable. They can be seen as containing many of the elements which could eventually be meshed into a more desirable future for the United States. Finally, of course, one can treat each document as a different "future history."

Before describing the various scenarios, it is essential to summarize briefly one set of scenarios which has been excluded from this material. There are a significant number of people who argue that a collapse of the world socioeconomy is already inevitable because we shall be unable to deal with the issues which presently confront us. Those advancing these views produce a broad range of arguments and scenarios which quite often seem compelling. The reason that collapse scenarios are not included here is that this guide is designed to help policy makers concerned with natural resources do better work in the future than has been done in the past. It is, therefore, a waste of time to examine those developments which would make it impossible for the society to function at all.

The four scenarios included are:

1. STATUS-QUO SCENARIO This is set out in terms of the President's State of the Union message for the year 2000. After severe problems in the eighties, the world has come back and slow but steady progress is once again being made. The major perceived problem is that levels of tension are still rising between the rich and the poor countries of the world and that no way out of this situation has yet been perceived.
2. HIGH TECHNOLOGY, HIGH GROWTH SCENARIO This is set out in a Wall Street Journal lead article of January 1, 2000, delivered to the subscriber's house by facsimile production. Once the United States regained its nerve, it proved possible to overcome the transient difficulties of the seventies and to increase the standard of living at a rate never achieved in the past.
3. LOW TECHNOLOGY, LOW GROWTH SCENARIO This is posted on a wall in a commune. The situation in the United States was turned around during the eighties so that the primary social drive became a desire for a more effective pattern of living within environmental limitations.
4. MANAGEMENT SCENARIO This report comes from the Terran Communication Center. It emphasizes the progress that has been made in developing skills to achieve better management. This scenario is heavily reliant on high levels of telecommunications and uses "appropriate" technology to achieve those goals which are seen to be desirable by the society.

As you work with these scenarios, you may want to criticize first those parts that do not appear coherent with the other ideas in the same scenario. You may want to discuss your criticisms with others. As you become more confident, you may want to write

your own scenario - either as a variant of one of those in this guide or in a completely new way.

In addition, you may want to compare the feasibility of the various scenarios. One way to do this may be to consider which of the driving forces set out in the last section are not taken account of. What would have to happen to make each scenario work? Does each scenario convince you that its parts hang together? Which scenario do you believe is the most feasible and the most desirable? And finally, how would you act to ensure its creation?

TRANSCRIPT OF THE STATE OF THE UNION MESSAGE IN THE YEAR 2000

My Fellow Americans,

I am delighted to give the State of the Union message for the year 2000 and to inform you of the directions in which I believe that we can and should move in the years to come.

As you are well aware, I am only the second President to serve a non-renewable six-year term as the result of the 30th amendment to the Constitution. My predecessor established a tradition which I believe to be valid and I shall continue. He set out the critical issues which he thought the next election debate should cover. Despite the fact that he was not of the same party, I am delighted to acknowledge that his lack of personal self-interest gave him a degree of credibility and effectiveness in his last year in office which was certainly not expected by the opponents on the six-year-term amendment.

My goal today will therefore be to draw a fair balance sheet of the state of the Union at this time. I am only too well aware that my position necessarily determines my perceptions and I have therefore asked two groups outside the government to provide very brief statements of their views and have included them as an integral part of my speech.

As always, we are confronted with very different views of the future. There are several groups which remain convinced that we could move into a bright new era if only their ideas were fully accepted. There are also pessimists who argue that we have passed the point of no return and collapse is inevitable. I submit that we should learn the lessons of the last decades and recognize that neither the extreme hopes of the technological optimists or the extraordinary fears of the social pessimists will be realized. We shall continue to survive although the tensions which have required large expenditures on armaments will continue at high levels for the foreseeable future.

Internally, our central problem is still the same as has plagued us over the last quarter century. We have created a society based on countervailing power. We moved in this direction because it seemed unfair to allow certain groups in the society to control others. Today when few groups are excluded from power, we have created a situation where it is extraordinarily difficult for policies to be developed on a coherent and continuing basis because there is no agreement between the varying pressure groups; fragmented adversary politics therefore dominate.

I am not suggesting that we should abandon our commitment to sharing power. I do believe, however, that we must look more

realistically at some of the consequences which have followed from this effort to ensure fairness in the society. As we all know, different groups continue to espouse fundamentally different visions of the world toward which we should struggle. There are those who feel that we could raise the standard of living far more rapidly if we were willing to commit ourselves to this goal through the use of high technology.

Representatives of this group have asked me to make the following statement in my State of the Union message:

"As you are well aware, there has only been a very slow rise in the standard of living in America, throughout the rich countries and indeed the world during the last two decades. This situation has been accompanied by significant rates of inflation which have gravely damaged social fabrics.

"We continue to believe that it is absolutely essential to use the potentials of high technology which exist throughout the various sectors of the economy. It is a sheer lack of nerve which prevents us from producing sufficient energy for all our needs. Only the fact that other countries have also suffered from a late twentieth century lassitude has prevented us from being in far worse shape than is now the case.

"We need to set the economy free from the various shackles that have been placed on it. All around us we see evidence of creative imagination and will power but we are like Gulliver bound by the Lilliputians. If you will curb the bureaucrats we can answer not only the crying needs of our own people but those in the rest of the world.

"We recognize that our rhetoric is 'overblown' but we believe that the beginning of a new century is the time for our nation to relearn the obvious truths which we have ignored for the last two decades. Mr. President, in your last year in office you have an unparalleled opportunity to show what can be done.

"We know that you are under pressure from other groups. We have tried to work with them but we have reached stalemate. Only inspired government leadership can break us out of our present situation."

From the other side of this debate, I hear calls for a firm move toward a realistic recognition of the peril of our planet and the need to plan in terms of ecological limits. Representatives of this group have asked me to make this statement to you:

"As you are well aware, the population of the earth is now at the 6 billion level and a further doubling is inevitable even if everything possible is done to minimize birth rates. At least a

million people a year find a way into the United States despite our redoubled technological efforts to close the Canadian and Mexican borders as well as our seacoasts.

"We are well aware that the standard of living has not risen in the last two decades. Indeed figures calculated on a reasonable basis, rather than using GNP models, show a major decline. It is our thesis that this result is inevitable and will continue. Only if we transfer our attention from the quantity of life to the quality of life can we meet our needs in the future.

"Even though we have been successful in holding down the extreme and absurd growth projections made in the early seventies, present patterns of ecological destruction are so serious that we must redouble our efforts to block further growth plans, and above all we must work against the extreme groups which are pushing for a return to a belief in high-technology routes into the future.

"Mr. President, we plead with you. At the beginning of this new century let us finally understand that humanity is part of the biosphere. Let us recognize that we may well be at the limits of what the biosphere will tolerate without rejecting us."

I could, of course, bring to this chamber other evidence of today's extraordinary splits. But you are as well aware of them as I am: indeed, that minority of you who will stand for a further term in the House or Senate are struggling to understand the cross-pressures.

Let me close by restating some of my own views. I wish that I could reintroduce the optimism of some of us who were in government in the early eighties. We thought that a new "management" pattern was being created which would break into the dangerous trends which seemed to be appearing. We thought that we might be able to restructure the society in appropriate ways which would open up new potentials for Americans and for all the rest of the world.

That hope was destroyed by the world's second great depression. It took all our skills to survive that crisis. Regrettably, insufficient thinking had been done to create effective change. We proved that it was possible for crisis to lead in unfavorable directions as well as favorable ones.

Looking therefore at the situation from my central position, and as one who is recipient of more pressures in the course of a day than it sometimes seems possible to manage, let me stress that I do not believe that either of the extreme views which I have reported to you earlier in this speech are either reasonable or politically feasible.

We have fought our way back from the abyss. The levels of endemic starvation in the poor countries of the world are once again at low levels although the areas of famine which result from destructive climate patterns continue to tax us to the limit.

We are once again making progress. We have invented new social institutions which have helped us to meet the needs of the society and to maintain the possibilities for a "free enterprise" style.

Voluntary service for young people - which now proves attractive to more than 80% of the population - has allowed us to care for people who need it, to manage the new biomass forests at reasonable costs, to restore the cities, to improve health and educational systems. While some fear that the "voluntary" system is becoming coercive because those who do not enter it will be deprived of various benefits later in life, this danger seems to me to be far less than the gains we are achieving.

We have managed to replace the need for much transportation through modern communication technologies. The remaining needs for transportation are being met, although less well than any of us would wish. For example, the requirement that no car shall be driven with less than three people in it produces grave hardships to citizens in certain areas. But the replanning of our communities and the help given to permit people to move closer to their jobs through house swaps is producing favorable results.

Education is slowly becoming more relevant to life. There are more and more school systems which mesh learning and living in creative and imaginative ways.

But I would be the first to agree that the long-run future is far from clear. Another doubling of the world's population, which does seem inevitable, will further increase the pressure on our borders. Desires for higher standards of living may not be able to be met. There are indeed serious questions about the stability of our total ecology.

I come to you therefore with no great plans and no clear cut message. We face a rapid aging of our population in the next twenty years. We have seen a worsening in the climate. We know that in a very real sense we have failed to come to grips with many urgent issues.

But we are still here. Some may say that we are only "muddling through." But it often seems to me that in a democratic society this is a compliment, rather than the insult which is intended.

What then do I hope from this election? Let us avoid high-blown rhetoric and unreasonable hopes and fears. Let us continue

to do the best we can, to settle for what our resources will support.

I suspect that 100 years from now a President will stand here and make a State of the Union message not too different from mine. Ladies and gentlemen, I give you the United States. Beseiged by problems, we survive. Long may we continue to do so!

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WALL STREET JOURNAL: ELECTRONIC DELIVERY SERVICE - JANUARY 1, 2000

Every day last week, Jim Smith woke up and read his personally produced edition of the Wall Street Journal, which contained just the information he had ordered. Jim always reads both lead articles as well as what used to be our "center column." He has listed a number of firms with which he wants to keep up and also a limited list of stock market prices. He also has specified certain country interests and general concerns: these can, of course, be changed at will.

Just recently Jim has been considering changing his job and he has asked for all the ads which might interest him, which are on file, and where positions are not yet filled. Last week twelve new ads were delivered to him over the breakfast table. When we talked to him yesterday morning, he told us that he thought he had found his new career opportunity. He will be working in the North Atlantic Weather Control Office, which has recently been expanding its operations dramatically, despite the rash of law suits which have plagued it in recent years because of the claims of various people that their interests have been damaged by its activities.

Why do we start a review of the last quarter of the twentieth century with this lead? Obviously, the electronic wizardry involved in this style of learning has become commonplace in recent years. Nevertheless, we tend to forget that there have been critical secondary and tertiary consequences which were not expected and are still not fully understood. For example, the movement away from a paper based society to electronic storage of information can serve as a symbol of the changes in patterns which are enabling us to sustain a far higher standard of living than in the seventies, without overstressing the resources which are available to us.

The movement away from paper dramatically shifted the forestry patterns in the United States by allowing the use of far more land for biomass needs and for recreation. In addition, and perhaps more critically, it dramatized to people throughout the world the possibilities of substitution through continued technological progress. The fears, and indeed paranoia, that had developed about the impacts of science and technology began to recede. The amount of money available for research and development began to increase in the mid-eighties and we are now seeing the fruits of this change in consciousness.

Obviously we have not yet recovered the years that we lost during the Neo-Luddite movement of the seventies, when many people echoed the thinking patterns of those people who smashed machines under the leadership of Ludd during the early nineteenth century in Britain. Several of the problems which plague us today would have been far better under control if we had used the seventies

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and early eighties to maximum advantage. Nevertheless, there is no doubt about the progress that we have made.

The fears and nightmares of the seventies and early eighties are now revealed for what they were - the classic responses which appear to afflict the human race at the end of each millenium. Our situation today is like coming out of the tunnel into the light. We see almost unlimited prospects. What are some of the reasons for this far brighter picture?

THE DEVELOPMENT OF TECHNOLOGICAL WIZARDRY

We have already referred to the central evolutionary pattern in the technological area over the last twenty-five years - the impact of telecommunications and microelectronics on the patterns of information movement and decision-making. It has proved possible for top management to regain control of decision-making systems, to obtain accurate up-to-date information, to involve the citizen in deciding on directions through instant polls, etc.

Tied into this new pattern has been the ability of micro-electronic systems to take over much of the repetitive mental work of the culture. The "working week" and "weekend" have lost their distinctness as the need to use limited leisure time facilities effectively has forced the development of patterns which ensure their use for the largest possible period of the year. The development of domes to provide "summer climates" during the extremes of winter has also been one of the important breakthroughs in meeting the needs of our increasingly leisure-oriented culture.

The acceptance of what would have been called "pornography" in the seventies as part of the culture has also been startling: the seeds of this development were, however, laid in the seventies. The spread of pornographic material and the later acceptance in the large cities of group sex showed the direction in which we were moving. It is now accepted that this is an appropriate way for many people to fill part of their leisure. As a related trend, families tend to survive for shorter periods but the new technologies provide ways to deal with the custodial and emotional needs of single-and-multi-parent children.

Central to the last two decades is the revolution in the energy picture. Only a few people realized in the early seventies that the high cost of fuels would inevitably result in the development both of radical conservation measures and the creation of new types of fuels. The time-scales for changes were drastically over-estimated - the prospects for synergy between various scientific fields were not understood. It became clear by the mid-eighties that fusion was a feasible, low-cost technology and the monopoly enjoyed by oil began to crumble in anticipation. We are now at the point where we can anticipate an effectively unlimited supply of

energy: this will allow us to mine low-grade ores, where this is a necessity.

The other major energy development has been the solar space stations which actually had a direct impact earlier than the fusion options. The contribution to world power needs became substantial in the early nineties despite growing fears of what could go wrong. Despite one significant accident, it is generally agreed that the costs outweigh the risks.

This availability of sufficient energy and the consequent "solution" of non-renewable resource problems is less critical than once expected because we have developed the ability to substitute on a far larger scale than seemed feasible twenty years ago. We have substituted computer storage for paper, fibre-optics for copper, decentralized solar systems for electric power and distribution systems, etc.

In addition, we have found ways to limit dramatically the need for various scarce items such as fertilizer, pesticides and water through computer-controlled monitoring of agriculture. This is just one example of the way that information has become a substitute for resources.

THE RISING INCOME FLOOR

Probably the greatest surprise of the last twenty years has been the speed with which population growth has come under control. The breakthroughs were, as usual, technological. For example, ways were found to limit the viability of male sperm so that conception was impossible if a male used a skin implant, this was effective for a full year. The failure rate is miniscule and the side effects minor - although there have been some reports of nausea.

In the poor countries, there is still a feeling in many areas of the world that birth control is the responsibility of the woman. Here again extraordinary technological progress has meant that most women have possibilities available to them which are also culturally acceptable. This does not mean, as we are all too well aware, that the tensions between the rich and the poor countries have vanished or can be expected to be eliminated in a brief period of time, but it is true that the end of the population spiral is now in sight.

The dramatic rises in the standard of living almost throughout the world, caused by a combination of slower population growth and more rapid innovation, have proved that fast economic growth, so often derided by liberals, is indeed the best way to pull up the standard of living in the poor countries of the world and the poor areas of the rich countries. The gap between the very rich and the very poor is now perhaps wider than ever but the standard of

living of everybody in the world has risen considerably. The only exceptions are what are sometimes known as the "international basket cases", which seem unable to move toward self-sustaining growth but their weight in the world are limited.

There is a growing recognition, of course, that a ceiling to growth will develop at some time during the coming century, but it is confidently expected that this level will not be reached until the standard of living throughout the world reaches at least the levels that prevailed in the rich countries in the nineteen-seventies.

Because of technological breakthroughs, both in the United States and the rest of the world, the prospects of famine have vanished finally from the face of the earth. The fears that the United States might have to overcrop its land to feed the hungry no longer exist. The assumption that supply and demand forces could, indeed, prove effective in allocating land has been totally vindicated.

THE ROLE OF THE MULTINATIONAL

This revolution away from pessimism and toward real hope has been driven by multinational corporations which have proven to be the only force capable of breaking through national and international red tape and moving the engine of progress forward once again.

We reached this point because the conservative movement which manifested itself clearly in the United States in the mid-seventies burgeoned rapidly, supported by changes in other governments such as Britain in 1979. The fetters which had been developed to limit the capacity of business to do what should be done were steadily reduced throughout the eighties. By the nineties a great deal of economic freedom had been restored.

Freed by this development and encouraged by the new patterns of public opinion, business launched out once again both into research and development and into entrepreneurial activities. Theoretical and practical barriers, which had been thought absolute, were broken so that today we live in a time of euphoria which approaches that in any previous period of history.

Indeed this euphoria could be our Achilles' heel. Although the pattern of the last twenty years has been far more favorable than the editors of this paper would ever have been willing to guess, it seems paradoxically appropriate to raise the type of questions which were seen as critical in the seventies and which we may be in danger of forgetting.

From the ecological standpoint, what are the limits to the capacity of the environment? The fact that we have not met any

Limits yet does not mean that we will not do so. We are today more aware of the long lead times involved in the appearance both of new individual health problems and environmentally systemic issues. The waves of innovation of the past years will certainly cause some new problems to develop.

The nature of the challenges confronting the human race are continuing to evolve with dizzying speed. To take one limited example, our bodily structures apparently are quite different when we are brought up with an adequate diet than in the past when most people had only just enough to eat. What does the combination of ever increasing heights with ever-increasing leisure imply for the future? What about the insight that all foods may be carcinogenic?

The human race has always flourished on challenge. For a significant proportion of the human race, the possibilities have never been greater. But it would be irresponsible to fail to recognize that many people do not have the capacity to meet the types of challenge which now exist. Could this situation have serious implications for the societal morale in the twenty-first century?

Present patterns seem set fair. But there are enough historians among our staff, who have cooperated in the development of this lead article, to cause us to worry about periods where dangers have apparently vanished. We would be interested in any letters to the editor which would inform us of the problems that might be hiding behind the sun.

But for the moment let us wish you a happy and prosperous twenty-first century in a world where there are at present no wars, no famines, no plagues. Let us hope that the Four Horsemen of the Apocalypse have indeed been banished for ever.

WALL POSTER - GREEN FORKS - JANUARY 1, 2000

As the new century emerges, I want to remind myself and others of the extraordinary victories that we have achieved in the last two decades which have moved us toward a sustainable, low growth, limited technology world.

During the second half of the seventies, it seemed impossible that we were going to control the juggernaut of economic growth and rapid change. All too often, citizen reaction to the impact of oil and gas shortages, as reflected by the media, seemed to be a demand for high technology solutions. Pressures built up to achieve efficient ways to produce more energy, particularly through the use of coal and nuclear power.

Those who tried to point out the need to consider the implications of these patterns of behavior on local and national ecology seemed to be losing ground. The possibility of overheating the world and thus flooding huge coastal areas, the possibility of cooling the earth and thus causing a new ice age, the dangers of destroying the ozone layer seemed to us to be largely ignored both by those who made public opinion and by the average citizen.

I was one of those who struggled through the increasingly depressing dark days of the late seventies. But the tide changed with the major nuclear accident in Pennsylvania in the late spring of 1979 and the gas shortage of the same period. The arguments of those who defended nuclear power as an essentially riskless technology were shown up as the hollow shams they actually were. The nuclear option was, as a result, rejected by the American people.

This backlash against nuclear power fortunately carried over into all the high technologies. We began to recognize as a society that it was essential to cut back on the "insults" made to the environment. We saw that we had been going along the wrong route and that it was essential to move back to a closer contact with nature and to limit the size and the impact of the man-made environment on the human person.

The change was extraordinary and dramatic. By the middle of the eighties we were set firmly toward the concept of a conserver society. Political leaders were no longer able to push for high technology or high economic growth without committing political suicide. Pressures were toward the decentralization of power and the reintroduction of community decision-making which, in turn, implied largely decentralized technologies.

As we all know, we did not find it easy to make the necessary changes in the society. The eighties were a time of great turmoil, both within the United States and many other rich countries which

followed the same route that we did. World patterns also changed dramatically as the United States ceased to consume as large a proportion of the world's resources as had been the case in the post-World-War-II years.

It would be pleasant to be able to say that we succeeded in anticipating the problems that emerged as we convinced people that they should use less resources. Unfortunately, as we look back on the patterns of the eighties, it is clear that our failures of understandings did cause much unnecessary suffering.

Much of this suffering developed from the fact that we were surprised by the speed and extent of the change in the culture: we were therefore not ready to cope with it. But, in addition, we did not listen to the knowledgeable people who were working with us and tried to warn us of some of the obvious secondary and tertiary consequences of the patterns that were developing. Nor were we as aware as we should have been of the depth of the socio-cultural changes which were developing and the consequences that would necessarily follow.

For example, conserver society patterns turned out to be linked to stable family structures. Some people returned to industrial-era nuclear family styles - more people moved into extended families as the architectural styles and zoning laws of our society changed and it became easier for large groups of people related by interests - if not blood - to live together.

A more serious surprise for most of us was the way in which the economic system began to unravel when people started to buy less goods and services. We had not really understood the implications of the Neo-Keynesian economic system which was based on the requirement that most people should have a job. Within such a system, jobs would only be available if there were sufficient demand for goods and services. As demand fell off, job availability was inadequate to provide jobs to all who wanted them.

There were many crises - personal, geographical and activity-oriented - as we moved away from the industrial-era types of activities which tied people to the speeds and styles of machines and toward the neo-natural communities of today, which operate on more organic time-scales. Large numbers of extremely poor people were unable to meet their food, fuel and housing bills. Indeed, as early as March 1979, the Wall Street Journal contained a lead article which reported on the number of people who were killed by the cold/starvation in the previous winter.

Today, we provide opportunities for work to all those who are willing - those who work have enough resources to live with dignity. We are still plagued with those who believe that the world owes them a living but there are ever-fewer places where they can hide and live without effort.

Internationally, the picture is very mixed, of course. Just as the increase in demand in the rich countries led to unexpected difficulties, so the decrease in world trade caused great disruption. However, the theories of Francis Lappe and others proved out in many cases: the decrease in demand from the rich countries freed up local economic potentials which existed in many of the developing countries once the depression of the eighties had been overcome.

There are still a large number of countries with very serious problems. We now know, however, that it is impossible to solve the difficulties of other communities than one's own, let alone the problems of other geographical areas than one's own. It is possible to be aware of other areas' problems but one can only help in ways that do not interfere in the natural feedback processes of nature and societies. This was the mistake that we made in the fifties, sixties and seventies and we are resolved never to move in this direction again.

There are some alarmists, of course, who are arguing that the end result of this approach will be to cause the more desperate countries to decide to take over North American resources. I do not believe that this result is probable but there are people who want to join Canada, Mexico and the United States together in a mutual defense pact. There would fortunately be extraordinary difficulties in implementing this proposal given the degree of decentralization that now exists.

Fortunately, however, I believe that there has been a continuing decline in the impact of ideologies and an ideologically-based conflict between various parts of the world now seems almost impossible. People throughout the world are so well aware of the difficulties that we have in staying within ecological bounds that fights about theoretical questions seem impossible. It seems extraordinary, from today's vantage point, that the primary concern of many analysts at the beginning of the eighties was the fear of a war between some unpredictable combination of the Russians, the NATO block and the Chinese.

What then of the future?

I am personally satisfied with where we are today because we have made so much more progress in the last twenty years than I would have believed possible. I cannot be as nervous about the next twenty five years, as some of the younger people are. It all too often seems to me that they are creating problems rather than perceiving them. But I do teach young people and I do recognize that their worries are real to them.

Last week, I asked some of our interns to write an essay on the twenty-first century for me - here are some of the quotes:

"Our community is very crowded and so is the world. Where am I to find the space that I feel I need?"

"We have been told by those who have lived through the last twenty years that we are using far less resources than in the past. I cannot believe it - we all seem to be so wasteful compared to what we could live on."

"What is the point of life? What are we meant to do with our existence? Why is it worth making an effort every day?"

"The Asian people have been asking for part of the North American continent because they are so much more crowded than us. They argue that it was our failure to help them to reduce birth rates at the same time as we reduced death rates in their countries that got them into their present precarious situation. As I try to be a leader in the twenty-first century, what is the right response?"

"Everybody says that we don't use high technologies. But I do not think this statement is true. Surely we should either get closer to mother nature again or we should recognize how much we still depend on high technology and take advantage of the inventions of the last twenty years."

I suppose that it is this last comment that shocks me most. I thought that I had convinced my students of the directions in which we are moving. Did I fail? If so, where did I go wrong?

Your comments on this wall poster are solicited. Please message me through the teleconferencing system - number 227 - and I will respond to you.

A happy new century to you!

04

TERRAN COMMUNICATION CENTER, JANUARY 1, 2000
(File F GET, MAKE, 2000 Evaluation)

Like many other people, I have been trying to write up my perceptions of the world as we enter the twenty-first century. I'm offering these summary perceptions and ideas to those of you who know me because you have asked about my feelings.

As you will remember, I was fortunate enough to get an Orwell Fellowship in 1984. These fellowships were founded in gratitude to Orwell for his body of work and particularly his book 1984. He forced us to think about the dangers of high technologies, particularly in the area of microelectronics. As a result of his warnings we were far more effective in searching for the positive potentials of these technologies. A couple of years ago, I joined the Terran Communication Center which is responsible for improving knowledge throughout the world and thus enhancing our capacity to make effective decisions.

The success of the Terran Communication Center is based, of course, on the understanding that decisions must be made on sapiential grounds - i.e. must be based on competence and knowledge rather than on power and position. As you will certainly remember, the shift away from power models and toward competency models in the eighties and early nineties created enormous tensions. This style does now seem to have been largely accepted.

But there are still dangerously high tensions in the world as we try to resolve the problems which developed because of failures of decision-making in the period between the end of the second world war and the beginning of the eighties, when the process of positive change became visible and effective. We have still not overcome the widespread deprivation - and limited starvation - in the poor countries although there are some viable reasons for hope for the first time.

Birth rates in the poor countries of the world have dropped very rapidly in the past twenty years. This change was due to technological breakthroughs, particularly in the area of male contraception, and also to more creative meshing between the cultural norms of various societies and the birth control technologies made available to these cultures. In addition, the socialization and reward process of most of the poor countries has been changed so that it accepts and benefits small families.

The drop in the birth rate has also permitted us to get ahead in the educational area for the first time. Throughout the sixties and seventies, in the vast majority of the developing countries, each generation of children was less well educated than the previous one. Now we can see a significant improvement in the competence of young people although definitions of competence are changing rapidly.

There have been several reasons for this improvement, besides the decrease in pressure because of less rapidly growing population cohorts. First, it is no longer assumed that the western industrial-era model of education will necessarily be appropriate in the poor countries. It is increasingly understood that the educational/socialization process must fit the realities of each particular area's situation. This better mesh between the specific needs of each area and the styles of education used has greatly increased the potential of most human beings.

Second, we are using microelectronic and communication potentials - particularly those in the oral mode - on a continuously intensifying basis. Critical to this change have been the patterns of knowledge restructuring, such as the problem/possibility focuser, developed by the Terran Communications Council.

Now let me list some of the changes which strike me most as I look back on the period since I was born in the early sixties:

-- The concept of personal and community growth has largely replaced that of "economic" growth. We have realized that the economic statistics on which we previously set such store were highly biased and created serious distortions in the decision-making process. We now look at different measurements than we did in the past and we are interested in resources primarily as they help or hinder our processes of individual and community growth. (From my earlier comments, you know that poor countries still face critical resource issues.)

-- Our growing ability to do more with less has been critically related to the abolition of the distinction between the "week" and the "weekend." Work and recreational resources are today used as intensively as is feasible without arbitrary time distinctions. Thus schools and churches, office buildings and theatres, fishing and hiking trails, are far more appropriately managed. (While we have moved to abolish arbitrary time distinctions, we are, however, far more conscious of the needs to work with daily, monthly and annual personal energy cycles.)

-- People who were born a decade or two before me still feel that their life styles are heavily restricted by the reduction in personal mobility that has occurred during the last twenty years. Most of us no longer feel justified in taking long-distance vacations, except under exceptional circumstances, as the cost in non-renewable resources is too great. Perhaps I should add that people born when I was, or afterwards, find it difficult to understand why people want to move around so much because we hate to leave our friends and our community. When we have to move our places of work we find ourselves adapting to new community styles with great difficulty.

-- There is today much greater movement in and out of leadership roles in the society than there was in the past. It is now considered pathological for a person to dedicate himself or herself to

service for the society for their whole lives. Rather, people move into and out of leadership roles in a far more flexible way than has ever previously been the case. As a result, we have found that the leadership pool is far larger than we had ever believed.

-- Pressures to keep oneself healthy have greatly increased in recent years. In most communities, there is very considerable pressure against irresponsible behavior likely to damage one's body or those of others. This style sometimes threatens to move over into "coercion" and there are crucial worries about this danger in certain of the health problem/possibility focuser groups. But the improvements in health patterns have been so great that almost everybody feels that the gains have been worth the costs up to the present time.

-- The increase in community pressures to maintain one's health is felt by most people to be more than counterbalanced by the decrease in the pressures around the legal area. By the end of the seventies, the fear of law suits was a major constraint against any form of creative action. The dangers of being sued had increased to the point that many people were not willing to take on social responsibilities. However, a reverse move to replace legal action with arbitration and mediation had been quietly gathering strength and burst out in the eighties.

-- Interestingly, I find that I have so far left out the incredible changes in the economic system over the last twenty years. We, of course, no longer operate under the Keynesian model which forced up consumption in order to provide jobs for all. Today, the system is worked from exactly the opposite end. We ask how much resources are needed for the operation of the society. We then try to ensure that people will do the minimum amount of toil and also ensure that people spend the greatest possible part of their lives doing the things which they believe are important for themselves and for their communities.

-- We have learned to understand the conceptual differences between renewable and non-renewable resources. We are more and more careful of those resources which, once used, are lost. We have, on the other hand, made extraordinary strides in growing and developing our renewable resources. The productivity of our forests has been rising at a 3% rate over the last twenty years and the rate has been increasing rather than declining.

In addition, and critically, we have been able both to preserve significant wilderness areas in the various parts of the country and to augment the effectiveness of joint use patterns. We are now reducing our needs for oil and gas at a pace which should ensure a relatively painless transition to a solar/biomass strategy. However, many of the issues around the importance that should be given to the high-technology model, as opposed to low-tech-decentralized styles, have not yet been resolved. For example, the first

solar space station which beams power down to earth has been completed and works but it has not yet been decided whether this is a desirable model for the future. On a related issue, questions are once again being raised about the amount of resources which should be used for deep space exploration; it is argued that now we are able to work with each other, on a planetary basis, there may be enormous advantages in going out into space in a cooperative effort.

If an observer from the seventies were jumped to this beginning of the twenty first century, I suppose that the most dramatic changes would be:

1. Extreme poverty does not exist in the United States, although some people still manage to waste resources to such an extent that they are quasi destitute.
2. Polls show that almost everybody uses themselves as having a higher quality of life than a decade ago although they recognize that they have fewer goods and services available to them.
3. Energy use is no higher than it was in the late seventies despite the increase in the population.

Now let me try to guess: what a member of the Terran Communication Center looking back on us from the 2025 might say in terms of our successes and failures:

1. Significant progress had been made by the year 2000 in developing a world management system. The creation of the Terran Communication Center still seems an almost miraculous event even from our perspective.
2. In 2000, there was far too little understanding of the implications of the dramatic aging of the population between 2000 and 2025 in the rich countries and between 2025 and 2050 in the poor nations.
3. While discussion had started by the year 2000 of the need for meshing logic and intuition in education and management, little real progress had been made in setting up effective systems.
4. Even the Terran Communication Center did not recognize in 2000 how much movement of the world's populations between continents would be needed. The large in-migrations from the overcrowded regions of the world to North America, Africa and Australia - the world's remaining open spaces - produced new strains on social fabrics when they had begun to settle down at the turn of the century.

As you will see, I think that we are still at the beginning of our challenges. But we have come this far, and we have turned some corners which previously seemed impossible. This should surely give us the courage to continue.

As always, I'd love to get your reactions to this document, message me here. The work that I am now doing makes these perceptions critical to my work and if they are wrong, I urgently need to correct them.

PART III

FUTURE DISCOVERY TECHNIQUES

76

INTRODUCTION

Having gotten this far in this guide, it may be useful to stop for a moment to consider how futurists work and think. All of us who use this label try to find out how to help ourselves and others understand the range of directions which may develop in coming years, decades and centuries.

As you might expect, there are very different styles of futurism. This guide uses certain assumptions about the appropriate form of teaching and learning in this field. Specifically, it is believed that:

-- the future is created as a result of our actions and the relevance of these actions in terms of the realities we confront.

-- there are many futures being promoted by different groups which are in conflict with each other. It is relevant and necessary to struggle to understand the assumptions which lie behind each of them.

-- not all futures are equally feasible: if society fails to discern what futures can, in fact, be brought into existence this could have disastrous results, given the power that the human race now has over its own evolution.

Where are the crucial differences in perceptions of the future? -- First, people disagree about the extent to which the future can be changed by the activities of those involved in it. Some view the future as essentially fixed - others view it as almost totally fluid. The attitude expressed here is that change is feasible but that it will only occur as the result of considerable imagination, care and effort.

Second, people disagree as to the patterns of behavior which we should expect from human beings. Can people be taught and helped to act in ways which will support the society or must they be coerced into doing so?

In order to become more skilled in looking at some new problems and possibilities, we have reprinted here some future discovery techniques which were first developed in 1973-74. If you find any of these interesting and would like to correspond with any of the authors you can write to them % Robert Theobald, P. O. Box 2240, Wickenburg, Arizona 85358.

1994 Auto-Bio Short Form

NOTES FROM ROBERT THEOBALD AND J. M. SCOTT

In 1969, while writing *Teg's 1994*, we realized that we needed a biographical document which would (a) be more self-evaluative than a regular curriculum vitae and (b) demonstrate changes in Teg's personality attributable to her experiences during her year of travel. (See *Teg's 1994* in Additional Reading?)

This material ultimately took the form of two similar documents, dating from the beginning and end of 1994. The second auto-bio is reproduced here.

Vocabulary: some new terms are used in *Teg's 1994*. LIFE PERIOD: first life period, birth to six years; second, seven to 13 years; third, 14 to 27 years; fourth, 28 years onward. These ages are not firmly fixed. People do not pass automatically from one life-period to the next according to chronological age, rather a RITES-DE-PASSAGE ceremony is performed when a person is ready. INTER/SITUATIONAL/OUTER are three language styles within any language. INTER is used for interchanges on any subject for which goals and conditions are already known. OUTER is used for interchanges where participants are voicing thoughts about new perceptions which are not yet fully understood. SITUATIONAL is used for interactions about ongoing situations; the syntactics chosen are common to all those involved in the situation, whether this be a time limited project or the evolution of a whole community.

Prepared: December 1994

Born: Arizona, 1974, August 3

Rites-de-Passage:

- 1st life-period to second: Quebec.
- 2nd life-period to third: Quebec.
- 3rd life-period to fourth: Quebec.
(January 1, 1995)

Major strengths:

- Good cross-cultural communication
- Ability in gestalt communication

Languages:

- Excellent English
- Excellent French
- Excellent Chinese
- Excellent Spanish
- Some Portuguese

Communication styles:

- Practice in OUTER, particularly OUTER-INTER conversations.
- SITUATIONAL, learned in Quebec City, but with wide experience of adaption to other communities.

Travel:

- Multi-community

Major life-events: I moved from Arizona to Quebec at the age of five. This left me with a tendency to emotional excesses which I have now learned to balance, having completed a period on Pill 2.

My socialization took place in Quebec. I was primarily introduced to the assumptions and activities of the invisible college, particularly those in biology/ecology. However, the community is balanced, and I gained experience in many other skills and interests.

My apprenticeship was with a synergist in Quebec. During my apprenticeship with him I became concerned about possible entropic implications of the societal decentralization of the '70s and '80s. He nominated me for a 1994 Orwell Fellowship which enabled me to explore the area.

I am just now completing my Orwell year. I am now convinced of the existence of critical terran entropies.

Area of interest: Creation of joint terran synergy myth. (Unavailable as facilitator unless directly concerned with work outlined above.)

Life-plan for beginning of fourth life-period: It is my intention to create a comprehensive interaction group to define the nature of the present entropies and determine the appropriate action-patterns for producing a joint terran synergy myth. The interaction group will have a preponderance of people in the third life-period, but there will be several people in the fourth life-period.

I anticipate that this area of interest will be time-limited, it seems to me that the reversal of present entropies must be sought in the "Terran Rites-de-Passage" between the second and third millennia.

NOTES FROM KENNETH DAVIS

In 1972, I used the model of Teg's auto-bio as one of a package of Future Discovery Techniques in my Utopia Game. My own auto-bio is reprinted on the next page.

It follows the Teg model closely but obviously covers the longer period of my own life. How wide is the possible application of this technique? Would a collection of auto-bios (a) show a representative sampling of ideas about the future, (b) demonstrate differences in views of the future between sexes, age groups, occupations? Or is this a tool best suited for self-analysis?

A FUTURE DISCOVERY
TECHNIQUE

Davis, Kenneth Wayne

1994 Auto-Bio Short Form

Prepared: September 1994**Born:** Iowa, 1945, June 22**Rites-de-passage:** Third life-period to fourth: Michigan**Major strengths:**

Good educational facilitation skills
Background in literary and dramatic arts
Ability in gestalt creation

Languages:

Excellent English
Some Spanish
Some French
Some German

Communication styles:

Practice in OUTER.
SITUATIONAL, learned in rural Iowa,
but with wide experience of adaption
to other communities.

Other community experiences:

Des Moines, Iowa; Nantucket, Mass.; New York, N.Y.; Baltimore, Md; Ann Arbor, Mich.; Washington, D.C.; England.

Major life-events: My socialization took place in an Iowa farming community where my parents were somewhat removed from the prevailing life-style by their occupation, the publication of a weekly newspaper.

My first major reorientation occurred during four years at Drake University, where I developed interest in literature and worked toward a BA in English. Among my activities during the period were a literary magazine, the student-faculty government, and the U.S. National Student Association. I was also active in organizing such academic-reform projects as the experimental college, course-and-teacher evaluation, and pass-fail grading.

My second major reorientation occurred during the following three years with my service in the U.S. Army as an enlisted man. I was assigned to the Army Intelligence School in Baltimore, Md., first as a student and then as an instructor. During off-duty hours, I served as education director for the Post Chapel, organizing both a theater company, for which I directed and acted, and the Chapel College, which I believe to have been the Army's first "free university."

During this time I met my wife, Bette, and was married to her in November 1970.

Following discharge from the Army, in 1971, and as a result of my decision to shift my problem/possibility area from literary research and criticism to educational facilitation, I entered the University of Michigan to work toward the PhD degree in English and education. During my first year at Michigan I taught freshman English and a creative writing course at Southern Michigan State Prison. During May and June 1972, Bette and I were interviewers for the National Survey of Youth.

During the remainder of 1972, I continued my course

work at Michigan and developed and facilitated the first session of the Utopia Game.

Late that year, our first child was born. I celebrated rites-de-passage into my fourth life-period in 1973.

I received my PhD from Michigan in 1974 and accepted a position as a Woodrow Wilson Intern on the faculty of a small college in the South, where I was in charge of the program preparing secondary teachers of English. In addition, I taught courses in myth and literature, continued the development and facilitation of the Utopia Game, and taught occasional English classes in local high schools. Our second child was born in 1976.

From 1977 through 1978, I served as administrative assistant, in Washington, to Representative Ralph Brown of Iowa, a long-time friend. In 1979 and 1980, my family and I lived in England, where I again headed a small-college program in English education.

In the fall of 1980, we returned to the U.S., where I took a dual position as Director of Des Moines Community High School and Professor of Education at Drake University. With the major reorganization of Drake in 1982, I became a member of its new Steering Committee.

In 1983, I was among those who met in San Francisco to organize the P/P Institute in Education, and I was elected to a five-year term as Institute Interaction Facilitator. During my term, we continued living in Des Moines, with the exception of frequent trips to attend Institute meetings and facilitate various local transition efforts.

Since 1988, we have lived in Nantucket, where I divide my time among serving as facilitator to several third-life-period apprentices, facilitating occasional sessions of the Utopia Game (such as the 1994 session in Ann Arbor), developing learning systems and materials, and working with the Nantucket arts/education consensive.

Areas of Interest:

Design and organization of alternative educational systems.
Development of educational facilitation skills.
Mythic patterns in literature, the mind, and society.

A FUTURE DISCOVERY
TECHNIQUE

Prepared: Fall 1972 by Kenneth Davis, 1120 McIntyre, Ann Arbor, Michigan 48105. (313) 761-7851

FUTURES CONDITIO
APRIL

1980 News Stories

Environmental Policies Change Threat to Planet's Survival Lessens

October 24, 1980

While the environmental threat to the future of the world cannot yet be stated to be under control, a panel of scientists was cautiously optimistic at the conclusion of its meeting this week. Their hopes were based less on hard evidence of a change in trends—although such evidence does exist—than on an alteration in the way in which the environmental and ecological issues are being viewed.

The group stated that several realities now appear to be accepted throughout the world:

- stabilization of the population at the lowest possible level consistent with the free choice of individuals is essential. The problems of preserving the viability of the planet are made more difficult by overcrowding and by the demands on scarce natural resources which grow with population.

- the gap between the countries living in abundance and those suffering from scarcity cannot be closed unless the abundant countries reorganize their cultures so as to use the smallest possible amount of raw materials consistent with meeting the needs of their citizens. They noted, in this connection, that there had been a decline in the importance attached to material goods in many areas of the world.

- waste is largely the result of failing to recycle resources or failing to use the waste by-products of one process to advance another.

- the regenerative power of the earth and the land are inherently limited although nobody can be sure about the precise danger points. Because it is impossible to know the exact position of the limits, it is essential that we avoid all unnecessary pollution.

In effect, the scientists argue, there has been a quiet revolution in the way the countries of the world look at the development question. At the beginning of the '70s it was believed that there were no limits to growth. Today it is recognized that the survival of mankind on the planet depends on his ingenuity in using his finite resources in a way that will provide adequate resources to all.

Is Death of Seas Now Inevitable? Question Posed by International Scientists

October 24, 1980

The destruction of all life in the seas could occur in the immediate future. Such a development would cause the death of mankind. This was the conclusion of an international group of scientists meeting under the auspices of the United Nations.

Questioned at a press conference following the release of the conclusions, a spokesman for the group stated that only immediate international agreement on radical measures would confront the danger. "Effective techniques for dealing with some of the most severe threats are still not known," he said.

"The progressive deterioration is now so severe that it is no longer a question of whether we will survive in the absence of corrective measures but whether the most extreme policies which we presently know how to take will be sufficient."

The extent of the threat to man's reserves of water began to be recognized in the late '60s. By this date, large bodies of water, such as Lake Erie in North America were losing many species of plant and animal life. At this point in time most of the damage was believed to be due to the consequences of excessive dumping of industrial and human wastes and the destruction caused by long-lived pesticides such as DDT.

Some limited efforts were made to get these problems under control in developed countries during the '70s but, on a global basis, these efforts were offset in large part by the rise in population. In addition, the agricultural green revolution which did succeed in preventing widespread famine in the '70s depended on new varieties of grain which required heavy applications of pesticides such as DDT, thus worsening the problem.

The '70s have proved that the problem of pollution is far more complex than was originally believed.

In 1970, the United Nations published a booklet, *The Challenge of a Decade: Global Development or Global Breakdown*. Contained in it were newspaper stories dated in 1980. Half of them assumed that we should fail to launch the required global partnership and half that we should manage to subordinate our ancient quarrels. One negative and one positive story are reprinted here. If you want to obtain the full booklet see "Additional Reading?"

A FUTURE DISCOVERY
TECHNIQUE

The Learning Web of Puget Sound came into being in 1985. Ten years of what we then called "planning" had finally created some awareness on the part of certain segments of the massive knowledge services—mediapersons, teachers, librarians, recreation professionals, museum curators—that they did share common goals. Earlier efforts at creating webs had been less than successful because they were limited usually to only one segment of the information field.

For example, in 1972 the five major libraries in the region had formed a cooperative that a few years later became the first genuine regional library network in this state. Concurrently, the breakdown of the educational system, coupled with heavy use by younger people and by the increasing hordes of senior citizens, was placing an inordinate strain on these public libraries. The school library, along with the school itself, was becoming obsolete.

Today in the year 2000, that earlier development, called "de-schooling" by a writer of the period, is complete. The Learning Web is not a "library," not a "museum," not a "school." Rather it is an almost totally pervasive communications system to which everyone, by choice, has access.

Of course we are still constantly fighting the problem of preserving individual rights to privacy, and we must build in safeguards to the system whenever we can, but this problem is endemic to this over-populated world today and not limited to our field (as broad as it is). In fact, one looks back with nostalgia to the age when the "disadvantaged" were those without access to information. Now an alarming number of people suffer from too much information. These "Overloads" must retreat temporarily, sometimes permanently, to sheltered communities.

Looking back, it is difficult to pinpoint the time when I became aware that the institution we called the library could no longer function in isolation from

other related service delivery systems. I believe it was in 1971, when I began to study the problem of measuring the effectiveness of our systems. (I'm still at it.) Our early premonitions were soon verified by the Taxpayers' Revolt of that decade, one of the first truly bloodless revolutions of recent history. It was the citizens who made it abundantly clear to the professionals in several related services that they would no longer con-
tenance the support of overlapping educational system.

By 1980, the tax dollar, as it was then known, was no longer capable of being subdivided further. The Disaster of 1981, of course, turned priorities to solving the massive environmental problems that had almost wiped out some societies. Continued growth of these separate "knowledge systems" was no longer feasible.

Though I plan to retreat someday to a Shelter, I find participation in this Learning Web, both as a weber and as a user, a fascinating experience.

Just today I plugged into the Web to contact some individuals interested in a current research passion of my own. Three likely prospects, one in China, one in Oregon, and another a colonist on the Moon, are open to query. If we can communicate by video, we will call a seminar via the Peer-Matching Network to bring in others who are interested, and one more learning group will be formed. Though I don't always know my next-door neighbor, my personal community is most satisfactory as well as infinitely expandable, thanks to the Web.

Let me describe this ingenious system more specifically. People who formerly were called librarians are now called rewebers. They provide reference services to educational objects such as books or data bits, as well as to objects in laboratories, museums, and even farms. They also access educators-at-large, as well as assisting in their selection by polling or consulting their

It is generally agreed that the style and content of all types of work will change dramatically before the end of the twentieth century. The following sketch was developed by Agnes Griffen, King County Library System, 300 8th Avenue, Seattle, Wash. 98109 FUTURES CONDITIONAL would like to see similar narratives depicting the futures of other types of work so as to throw light on the ways in which activities may change and appropriate educational patterns may alter.

FUTURE WORK

2000
LEARNING
WEB

former clients. "Teachers" are now called edwebbers and are largely responsible for operating the Skills Exchanges and the Peer-Matching networks. The mediawebers concentrate on facilitating the electronic transfer of ideas and images.

All of us focus our skills on communicating the record of the past and present reality, through all media including the person-to-person realm. We do not see ourselves as "helpers" for that assumes a patronizing approach to people, but as fellow-scholars and learners and information-sharers.

Yes, we do have facilities. Our Weblets are located everywhere. The Standards state there should be one every square mile that is populated, but this is flexible. You will find a Weblet next to a theater, at a collection center for the Metransitsystem—wherever people wait for anything you will be enticed by samples of our wares.

You may find softbooks, instant videotapes and players, learning games, and of course the ubiquitous terminal that ties it all together. The staff members are certified only as "human communicators," chosen for their ability to interpret the stories, poetry, history, ideas, works of art, to the passing crowds. We worry less about loss than about overstock, for we fight the growing apathy that can come with overabundance of information. (The old guard Social Responsibilities types are now calling for a halt to information production.)

Our "stacks" are all on microfiche in a central storehouse, instantly accessible by anyone through his own personal transceiver or through the terminals in the Weblets. Of course, each home has a Webtube....

A FUTURE DISCOVERY
TECHNIQUE

We believe any group can be creative. We work in schools, festivals, jails, colleges...usually with amateurs. Three or four of us help them invent a theme, cast it, and then play into it or direct it. Or both.

We believe any group can celebrate common experiences—by exploring them, defining them. Always dramatically—through roleplay: trade memories...trade information.

We believe that when a group projects a roleplay into the *future*, that's "myth." Modern myth. Created by a group.

"Myth?" you may ask. "That's not myth."

Let's look closer. One improvisation we've done suggests:

There will be a nuclear disaster soon.
 Only two people on the globe will survive.
 They will both be men and therefore unable to reproduce themselves.
 They will also be unable to cooperate in survival because they hate each other.

To me, this is as rock-basic as the myth of, say *Prometheus* that we read in school. *Rip Brown & Archie Bunker* as the dead-end of our species—that's as relevant a myth for our children as *Cupid & Psyche* or *Orpheus & Eurydice*.

Depending on how the idea gets cast, directed, and played, (in group creativity), the improv could also take

a positive shape. The teenage writers might be pleading, "What does it take to make Man cooperate—global death?" They might be protesting: "The death of Mankind is too high a price to pay for the pleasures American men take in prejudice and hate."

I can't say whether this myth expressed belief in death or a plea for love, because it was never chosen to be played by this particular group. If you play it out, please let us know exactly what it means to your group.

There are two ways in which we carry out our roleplaying process:

A group of people *together* may ask for an idea to be played out. We call this "group writing." For instance, at Riverhead High School, we were asked by four teenagers to do

WHO _____ *boy*
 WHERE _____ *park*
 WHO ELSE _____ *girl*
 WHAT'S HAPPENING _____ *smoking*

Alternatively a group of people one after another may direct an improvisation so that a myth emerges. We call this "group direction." For instance, one "director" may ask a boy and girl to break the law in an improvisation—say by smoking pot. Another "director" may ask for a cop to enter the action and bust them.

Let's look at this myth, which was cast, played, and directed by several groups. It appears to be a quiet sort of

CREATING MYTH

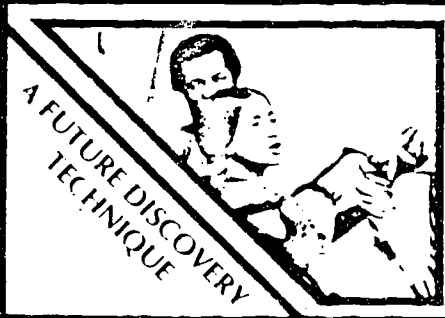


One night, after the captain has been turned on, the audience cast *me!* as chief of police. So I entered the action to add my stern note of reality...and found myself hoisted onto the shoulders of five tall teenagers, carried out of the room where we were playing, and dumped very gently onto the floor outside in the hall.

Fantasy! Self indulgence! I muttered to myself.

OK. But behind this childish myth lies a plea for:

- a new breed of teenagers able to communicate and share with policemen;
- a new breed of policemen able to communicate and share with youth;
- a future in which the energy of authority meets the energy of youthful freedom in some kind of social communion—not violence.



scene request. Either two of our players, or two amateurs, would volunteer. Invariably, somebody in the audience would call out, "Hold it! Now they turn on the cop."

Then someone would call out, "Cut! The precinct captain strolls by." Somebody was always ready to play the captain.

"Cut!" the next direction would emerge: "They turn him on, too."

In fact, this myth, shaped alternately by voices of restraint and rebellion, is an answer to the first myth about the end of the world.

Contact David Shepherd, Group Creativity Project, 344 West 36th Street, New York, NY 10018. Photographs courtesy of Monroe Litman, 465 West 125th Street, New York 10027, NY.

FUTURE CITIES

The process of inventing the future (IF) has been developed to assist citizens, government officials, civic and professional leaders to think clearly about the kind of future they want and intend to bring about. Its aim is to release the capacity for social invention through an imaginative development of alternative goals and the formulation and analysis of public policies which make the achievement of these goals more feasible. In a time of drift, when many people feel both helpless and hopeless, IF is a way of engaging the imaginations and intentions of people to invent a better future and to figure out how to make it happen. IF puts people at the center of public policy formulation.

Inventive planning attempts to transform the goal-setting process into an activity which immediately engages the participant as person. In the first exercise, participants were asked to formulate goals to which they were prepared to offer personal commitment by taking action in the present to bring that goal into existence in the future. For the purposes of the workshop, the future was defined as 1990 and the goals were for the specific policy domains which had been determined in advance. Participants were asked to write their goals as to concrete specific intentions, rather than vague general statements of value, and to identify two indicators which would demonstrate that the goal had been achieved.

The group was then asked to move into the future, assume their goals had been achieved and consider the consequences. The transformation from goal to occurred-state-of-affairs provides practice in meeting two criteria central to the futures-invention process. The first is the task of continuously transforming the general into the specific in the interest of clarifying the meaning of the goal. The second is to

develop the facility to move back and forth, rapidly and easily in one's imagination, between the present and the future, so that participants become accustomed to imagining themselves in the future they want to bring about. In identifying the consequences of their goals, participants were asked to consider non-beneficial as well as beneficial consequences.

At this point in the workshop, the process of personal goal formulation became translated into a policy-formulation process. Each of the goals was a candidate for top priority based on participants' analysis of how enhancing or inhibiting any other person's goals, if achieved, would be to the achievement of their own goals. The technique employed in the analysis was the Cross-Purpose Matrix. Each participant was given a Matrix form and asked to consider his goal in relation to the other goals in his particular policy domain.

Now that each policy group had a priority goal for 1990, its indicators and consequences, it was time to ask how the state of affairs had come about. Working backward in time, rather than forward, each participant set forth a series of plausible events which were linked to each other from the occurred goal back to the present. Using their "memories of the future," participants selected four events, one for each time period -- 1989-85, 1984-80, 1979-75, 1974-73 -- which could sufficiently explain the achievement of the goal by 1990.

The next step in the process transformed the future history into a strategy moving forward from the present to the future. Participants were told to look upon their 1973-74 event as a strategy goal and write three tactics designed to bring about the event. A critical analysis of the tactics was called for and the noting of a consequence for each tactic was included in

the assignment.

Policy groups then met to complete their scenarios. Each group now had a policy goal with indicators and consequences, a futures-history, and a strategy leading to the goal's achievement. These were posted on large sheets of paper around the walls for all to view.

In an attempt to determine the most powerful goal, each participant considered his policy group goal in relation to each of the others, working with a cross-purpose matrix. Individuals then gathered in their policy groups to tabulate their responses and arrive at a consensus of the impact the goals would have on one another.

Returning to the plenary session, each group reported the degree of positive and negative aspects for each goal and the information was recorded on a master matrix sheet. No policy priority was evident in the final tabulation.

In the final discussion, the group was told that a purpose of the process was to reveal to them "where they were" and asked the participants for comments. Some suggested that the results showed that change was necessary in all areas and that Memphis' problems were too interrelated to determine a priority goal. Others remarked that the group was idealistic; that individuals were too polite and compromising so that minority opinions did not get expressed; that some of the most exciting and innovative ideas were lost; and that, in reaching consensus, they proposed goals which were too general. They also wished for more diversity of opinion in the sub-groups.

The process was tried out at a goal setting workshop inaugurating The Center for the Study of Alternative Futures. For more information write: May Maury Harding, The Center, 2000 North Parkway, Memphis, TN 38112.

A FUTURE DISCOVERY
TECHNIQUE

CREATING ACTION

The Environmental Education Center at Portland State University is convinced that people need an opportunity to see the relevance of larger systems to their decisions and thus to become effective systems thinkers. The EEC has been exploring this in rather an indirect way by arranging practice sessions in holistic thinking as part of the Expo 74 Local Environment Awareness Program.

Fifteen citizens, already interested or involved in local environment affairs, were invited to participate in a two-day NASA-sponsored conference on the Earth Resources Technology Satellite. (ERTS is a satellite which circles the globe and takes detailed pictures of the Earth from space. For more information, see *Science News*, June 24, 1973.) The purpose of the NASA conference was to provide information to agency and industry officials on the possible uses of this new technology for assessing land, geologic, and renewable resources.

During the following four weeks, the fifteen participants met for lunch once a week in the relaxed atmosphere of the Environmental Education Center to react, digest, and relate the ERTS possibility to the Oregon environment. The stated tasks of these meetings were to:

- brainstorm possible uses of ERTS technology;
- suggest ways of conveying holistic views on environmental problems to the public at Expo and in Portland.

The unstated but more basic purposes of these meetings were to provide an opportunity for fifteen people in related interest or working areas to discover each others' relevance, and to provide an opportunity to practice more holistic thinking about the environment.

Several characteristics of these meetings encouraged the accomplishment of these basic purposes:

1. The tasks listed above were de-

finied to stimulate group thinking and to create a sense of group purpose, while providing a minimal structure for the group meetings.

2. Through Expo funding, money was available to the group should it choose to plan a community education effort of some kind, but production of a "product" was optional.

3. Group leadership was facilitative rather than directive, thus ensuring a relaxed atmosphere.

4. Most important, the ERTS, the starting topic for discussion, was a possibility. It seems almost essential to choose a possibility rather than a problem if one is to create a free discussion space. When a group meets around a problem, the area for discussion is to a large degree already defined, and the participants' roles are pre-structured around this. Therefore, the solution or product itself is necessarily limited, and probably already determined. Groups usually meet when a problem becomes so obvious that they can agree on its nature and find it imperative to discover an immediate solution. Often the one-dimensionality of these solutions is strengthened because individuals from a single profession or experience have defined the problem.

Most issues restrict choice and the possibility for holistic problem-solving even further because each issue usually resolves itself into only two sides. Often the choices are stated in such a way as to eliminate all but one of the options, i.e. "Shall we build this freeway through this lovely park or through this ugly slum?" Our citizenry is presently only able to be involved in societal planning on this narrow issue basis.

The ERTS photographs were, in this case, the possibility around which the group met. They had concrete relevance both to environmental problems and the inspirational magic associated with the view of the Earth from the Moon. Since no one had previously thought about ERTS, participants

didn't associate it with environmental issues or problems.

Asking people to practice thinking in relationships around a new possibility poses difficulties for some. In unfamiliar situations, they fall back on their roles as organizational representatives. They feel uncomfortable in a situation where they must invent the relevance of their group. Often, people's skills in thinking are limited to problem-solving techniques and are appropriate only when the problem is already defined; when they try to interact around an undefined possibility, they feel uncomfortable.

Viewing one's work from an entirely different perspective—in this case from 900 kilometers up—can suggest a range of problems, options, and variables which an individual can't invent through his present work, interest, or experience structures.

This group did complete the two stated tasks of the seminar, and some of them continued working together on an associated Portland environment education project relating land use and energy. Perhaps the best sign of group success was that more than three-quarters of the participants attended each of the meetings. In order to evaluate whether group participants were able to relate the whole environment to their daily decisions as a result of the experience, we asked each what had been useful about the seminar. Most replied: the contact with other participants and specific ERTS information, including pictures of Oregon land; some said that the most important result was the broader view of the environment that the group developed.

Like all meaningful future discovery techniques, it is highly improbable that duplication of this idea will be effective. Those who would like more information so that they can adapt this idea to their own needs should contact: Laura Williamson, 3725 S.E. Francis, Portland, OR 97201.

A FUTURE DISCOVERY
TECHNIQUE

PART IV

S O C I A L I S S U E S

INTRODUCTION

A sharp distinction has been made between "driving forces" and "social issues" throughout this report. A "driving force" is a pattern whose fundamental thrusts are likely to continue largely unchanged regardless of the directions of policy in the United States and in the world. A "social issue" is one which can take on fundamentally different shapes dependent on policy choices.

This section of the guide considers a few of the most crucial social issues. In examining these social issues you are asked to imagine yourself into the following situation.

You have just received the following material from a television producer. You are personally interested in the critical social issues but you are also a realist. You know that you must convince those around you that serious programming will not "bomb."

To give you more latitude, you can choose any role in which you might have received this letter. You can think of yourself as the head of a network who has received a letter from a previous colleague. You can think of yourself as somebody in middle management who has received a letter from a subordinate. You can choose to operate in the commercial or the public broadcasting sector. You can think of yourself as being in the White House, which has asked for a proposal in this area. Or you can think of yourself as the Secretary of Agriculture who might have concluded that agricultural policy cannot be made without a greater understanding of the overall issues of the day.

Here is the letter you have just received:

"Dear Mr. Smith,

As you will remember, we have talked several times about the possibility of creative television programming which would enable the American people to understand more effectively the types of issues which are going to emerge in the eighties. We have both regretted the fact that there seems to be no way in which it is possible to reach large numbers of people through patterns which will enable new thinking to take place.

I have been so concerned by this apparent reality that I decided to write up a proposal so that we can decide whether the position is as hopeless as we have tended to assume in our on-again, off-again conversations. I must admit that as I have developed this material, I have come to believe that it would indeed be possible to create suitable programming. I therefore await your reactions hopefully.

Let me start by restating three of the assumptions which we have talked about together and which underlie the rationale for this effort:

1. There is growing conflict between the goals of various people and groups in the United States. This conflict, unless it is better understood, is likely to lead to increasing difficulties in decision-making. Thus, meshing the desire for equity and the drive toward economic growth may well need different sets of policies today than in the past. Similarly, educational policies and the styles of jobs which will be available in the future may also be out of phase. Examples of this type of conflict can be multiplied many times.
2. The conventional wisdom assumes that people in the United States are not ready to consider fundamental change. This viewpoint is certainly supported by some of the polls which have been taken in recent years. But there are contradictory polls which show a willingness to look at totally new directions. What are we to make of this contradictory evidence?
3. In our conversations, we have suggested at various times that there is a gap between what people really believe and what they think they "should" say or "can afford" to state within their role models. I have told you about some of my positive experiences. I have been able to work with groups in far more fundamental and creative ways than their public image would appear to make feasible.

I am convinced that there is already a felt personal and community need for better information. There is also obviously an urgent need for more complete knowledge if governmental systems are to remain viable. This would suggest that a mesh between the two desires should be easy. Unfortunately, as we both know, this is not the case. What then is the block to new styles of television programming and other styles of information movement? I believe that it can be relatively easily identified.

We all know the figures which demonstrate the precipitous decline in trust in various institutions - and those who represent these institutions - in the United States over the last fifteen years. We remember, less often, the inevitable corrolary of this situation - that people are unwilling to believe the statements of leaders who they are sure have failed to level with them in the past. Any TV programming, based on information which emerges from these distrusted people and institutions, is essentially doomed to failure before it starts. It cannot possibly receive the fundamental attention which it must have if it is to affect significantly established dynamics in the United States.

This would seem to bring us to a dead-end. Fortunately this is not the case. Several people and groups have been trying to

discover new ways to structure knowledge. The new styles they are creating make it possible for individuals to understand the differences which exist between the views of various people and groups on a specific subject and to help them to understand the reasons for their differences. I attach to my letter a document describing the "Problem/Possibility Focuser" format which shows the styles now being developed.

I am arguing that it is essential for any programming on these fundamental issues to accept and clarify the existence of very different views on topics and the reasons for these disagreements. I am convinced that it is only in this way that the general public will make the effort to try to learn the complexities of our present situation. People are now highly confused by the different points of view that are being advanced and they want, above all, to learn new ideas to enable them to make sense of these apparent disagreements.

Recently, for example, on the "Good-Morning America" show, David Hartman asked two senators how each of them and the President could confront the same set of "facts" and reach such different policy conclusions. Similar pleas to help the public understand the reasons for differences are heard more and more often. We could effectively help the public with new style programming using the problem/possibility focuser approach.

What sorts of subjects am I suggesting we examine: here are some ideas although the order in which they are placed is random.

1. THE BABY BOOM ECHO The number of women in child-bearing ages is continuing to rise and will do so throughout the eighties. This has not so far caused a large increase in the number of births. Will this situation continue or may new trends develop which will cause people to want more children or less? Will rights to abortion be limited? This program could help people understand the interconnections of economics, values, attitudes, and birth rates. (I have set out each of these social issues at somewhat greater length in an appendix to this letter, but I am summarizing here so that your colleagues may have a shorter document to which they can react.)
2. STYLES OF EDUCATION As you know the "back to the basics" siren song continues to be heard in the land. It is certainly having some effects, many of these seem favorable to people who grew up in the industrial era. The question which we would need to take on in this program is whether the basics for the twenty-first century are the same as those we teach today. (I wonder if mothers with children being born this year realize that they will not leave college until the twenty-first century.)

3. LEVELS OF MORALE Is it possible for a society to function with present levels of morale? What could be done to bring back trust? Do we need truly different patterns of knowledge and leadership than we have had in the past?
4. ACCEPTABILITY OF HIGH TECHNOLOGY Obviously the citizens of the United States are being whiplashed between those people who feel that only high technology will save us and those who fear its consequences. The recent problems with nuclear power have obviously made the issues far more acute. What are the real options open to us in a world with 4 billion people now, and at least 8 billion before population stability is achieved?
5. ECONOMIC SYSTEMS We have accepted the neo-Keynesian economic mode. It has worked very badly for us during the past decade but there has been no effective challenge to it. Where are the new economic thinkers? Given the nature and extent of the challenge, why have there been so few new significant ideas? Or have there been new ideas and the transmission belt to the public is missing?
6. LAW OR MEDIATION/ARBITRATION It is clear that we have become a litigious society. Why? Is this pattern tied, as many people believe, to the decline in trust, the feeling that one has probably been cheated and one should get compensation whenever one can? If this is the case, how could the trend be reversed? Are there real possibilities in the field of arbitration and mediation or are they chimeras?
7. EQUALITY VS DIVERSITY We have been moving toward a more "equal" society for a long time. Now a backlash is developing against the idea. Did we misinterpret the idea of equality? What can we learn from the Bakke case? What lessons should we learn from the fact that ecological systems seem to need diversity? Does this mean that human systems need it also?
8. LEVELS AND STYLES OF DECISION-MAKING We are very well aware today of the demand for more local autonomy. However, there are also people who believe that more centralization is essential for the effective running of the United States at the present time. We can expect to see very tense discussions, and probably, confrontations around this issue in coming years. We need to look at the world differently - how can people be introduced to this idea successfully?

This letter has already run on too long. But I must add that it will not be enough simply to produce and air these shows. We

would have to produce a whole series of locally-based efforts if we are to reach people effectively. I hope that you can make suggestions as to the ways to do this, building on previous follow-up promotional efforts.

I look forward to an early reply,

Sincerely yours,

Jane Brown"

8/2

Letter to Jim Smith - Attachment 1
Problem/Possibility Focuser

SUMMARY

Our patterns of knowledge creation and distribution are derived from the norms of the industrial era. This is one of a number of documents which I am developing to propose new means of learning and teaching, of creating and distributing knowledge which will be suitable for use in the emerging communications era. All of these tools and techniques have been used on various occasions and have proved workable but there is a need of improvement both in their application and their development. Any and all feed-back will be appreciated.

Many people seem to believe that it is impossible today to gain an overall picture of the nature of the problems and possibilities in any of our fields of concern (e.g. energy, food, climate, health, education, economics, etc.). It is argued here that this situation results directly from the styles and values of the industrial era because the accepted form of behavior is to propose policies without clarifying the values and assumptions which lead to the policy proposal. An alternative form of knowledge creation and distribution is proposed here which would be designed to clarify on a continuing basis why people reach their conclusions and to give citizens a chance to determine whether they agree or disagree.

1. The Issue Viewed From the "Extrapolist" Viewpoint.
 (Extrapolist thinkers are those who do not anticipate much change in current patterns.)

One of the most startling realizations of the second half of the nineteenth century was the extent of the disagreement around today's critical issues. In the last two years the patterns of consensus which have made it possible to govern the United States and other Western nations have largely disappeared. Various politicians today have rallied the different classes about the nature of the problem which confronts us, the values which we should structure our society, the types of behavior which we should expect or have brought about in the past, the types of solutions which should be pursued.

The present political situation is a direct result of an increasing polarization of the population into two camps and beliefs which are diametrically opposed. The two camps have been defined in terms of their attitudes toward the future. One camp has desired a continuation of the present patterns of behavior and the other has desired a radical change in the patterns of behavior. The two camps have been defined in terms of their attitudes toward the future.

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to convince Congress that there are self-evident realities within which policy should be made. It is now clear that many members of Congress, much of the public and a large proportion of the special interest groups do not share the vision of the President. Passage of any coherent energy policy is thus literally inconceivable.

Unfortunately, there is a built-in vicious circle which results from failure to keep up with changing circumstances. As people become more concerned about any area of policy, they become shriller in pushing for their alternatives. Those at the center of the decision-making process therefore find themselves undergoing ever-more intense pressure: the facts, data, values and theories which led to the policy suggestions of various groups are harder and harder to discern because they are buried under deeper and deeper piles of rhetoric. This in turn leads to power, rather than reality, having more and more impact on the decision-making process.

We are moving rapidly in this direction in all the most critical areas of our society. The pressures around the issues of employment, energy, food, ecology, housing, water, etc., etc. are so intense that it is almost impossible for even the most concerned citizen or decision-maker to sort out the realities. This is true also for any of the sub-issues within a field: for example, it is extremely difficult to understand what the real issues are in terms of the potential of solar, geothermal and nuclear energy.

Many of those in the industrial-era decision-making system are only too well aware of their situation but they see no way to break out of it. The inertia and the survival instincts of all those within systems tend to reinforce their pathologies and to overwhelm the small and hesitant steps taken to change the dynamics which presently exist. Indeed, the central assumptions of the industrial-era system make it impossible to pay serious attention to communications-era concepts which emerge from a fundamentally different pattern of thinking.

There are two key assumptions in industrial-era decision-making. First, it is believed that there is a right answer to any question and that this is known by the most expert individual or the most expert group. This approach results from the concept that it is possible to look at any situation objectively, to perceive all the realities within it and for the person who is most skilled to give the right answer. It is this assumption which leads to the ever-growing conflict between "expert" testimony. Second, it is assumed that it is possible to consider the results of policies and actions in one field without thinking seriously about their interconnections with other areas of the socioeconomic system.

The Committee structure which exists, for example, in the National Congress and State Legislatures, is set up so that it is possible for people to consider energy policy without a systemic

look at the consequences on ecology and the economy. President Carter clearly presented his energy policy before he had been able to work out even the primary implications for jobs and ecology. It is seldom recognized that there are secondary and tertiary results of policies besides the desired primary effects! As people and systems become more sophisticated they are learning to respond in ways which limit or palliate the negative effects of any set of legislation on them. This is the reason why most types of control measures, for example price control, are necessarily ineffective.

It is fascinating that both positive and negative extrapolists (i.e. those who see the certainty of improvement and catastrophe) are willing to trust the same information structuring techniques. While their conclusions about the future are diametrically opposed, the ways that they structure their thinking are very similar. To use a games analogy, those holding both viewpoints are willing to play baseball - although they differ about the way the game will come out.

2. The Issue Viewed From the Romantic Viewpoint (Romantics are people who believe that the primary issue is changing the ways that human beings behave.)

For the romantic, the ultimate reality is the individual's or the group's view of what exists and is happening. There has been little concern about the issues of societal governance with which this piece is concerned for the broad question of how to create societal consensus is either seen as automatically soluble by goodwill or ignored. Nevertheless, and paradoxically, the shift in thinking caused by the romantic vision can be the first step toward new patterns of understanding.

3. The Challenge Viewed From the Communications-Era

Given these serious difficulties with our present decision-making system, why are people still so confident of our survival and success? The reason stems from another hidden assumption of the industrial era: that we can think about our socioeconomic system as a machine which may break down but which can always be mended. Thus, it is assumed that although there will be sticky moments we shall eventually "muddle through."

But people who have learned system theory know that this is not an appropriate model. Systems oscillate: one can see this clearly in such natural cycles as coyote-rabbit interactions. However, cyclical behavior is apparently present in almost all systems including complex natural systems and we should therefore ask ourselves whether the patterns of oscillations which exist at the present time in our society are healthy.

To do this we must recognize that systems behave in three ways: they have oscillations which decrease in magnitude, or they increase in magnitude or they are stable. (Systems are, of course, far more complex than this but this statement is adequate for this purpose.) Think of a pendulum: If it swings the same distance each time it is a stable system; if it swings less and less each time it is a damping system; if it swings further and further each time it is an expanding system.

Systems which have increasing oscillations are instable and will break down: the only question is when. Most system analysts would agree that the industrial era is suffering through cycles of increasing magnitude and it is for this reason that people who think in communications era terms cannot accept that it will be possible for us to continue to "muddle through."

Some examples may be useful. The first World War came about because the current world order was dramatically instable. The shooting of a relatively minor figure (in an "unimportant" part of the world) was sufficient to upset a system which appeared to most participants in it to be not only stable but essentially eternal. Similarly, the great depression was triggered at a time when everybody "knew" that prosperity would continue forever. A growing number of people are afraid that the present national and international systems are equally instable: the way in which the breakdown will develop will, of course, not be known until it develops.

One useful image is an avalanche. It is poised ready to descend from the shifting of one stone, the firing of a shot, a slight change in climate conditions. It is not useful to search out the exact factor which caused the avalanche: rather one must be aware of the quasi-certainty of the avalanche and act to minimize its effects either by avoidance if possible or by setting off the destructive energy in a way where the consequences will be least damaging.

In effect, therefore, it is urgent that we recognize the instability of present systems and start to find ways to minimize the dangers which result from this instability. We also need to begin to create new information systems which defuse the current instabilities which presently exist by helping people to gain different visions of their self-interest in the light of the new conditions which are emerging. An effective community needs to be recognized as one which can deal with its problems before they become acute and can recognize possibilities while they are available. The problem/possibility focuser is one technique designed to move us in this direction.

4. The Response

A. General Description

The problem/possibility focuser approach is designed to focus on the questions which need answering rather than to suggest that there is a unique set of policy answers which can be immediately and effectively applied. It is appropriate for use when there is no agreement about the real issues which are critical in a particular area of concern. Its use could therefore be effective today across a broad range of concerns.

A problem/possibility focuser gives a picture of the status of the debate on the subject under consideration on a continuing basis. Those engaged in producing it recognize that they will necessarily disagree: they try to find what can be understood and agreed which will clarify the nature of the real issues involved. Instead of looking for a technological fix, there is an acceptance of the need for continued "messiness" in the culture.

The problem/possibility focuser approach can be applied at various geographical scales and for any subject of real concern. For example, one can think about problem/possibility focusers on the water problem in Tucson, the educational issues in the central areas of Detroit, the nuclear power issues in the United States and the global food problem. Problem/possibility focusers, however, are also suitable for use within any institution: a business could use the technique to determine whether it should enter a new activity, a church could use it to discover what their attitude should be to poverty, an educational institution could use it to determine how to deal with the possibility of declining enrollments.

The existing conception of the problem/possibility focuser which is, of course, still evolving, has four parts:

- 1) The first section describes the agreements which exist around a particular issue, especially the factors which cause people to accept that this is an issue which deserves continuing attention. Taking examples from the field of food one would list, among other issues:

the mal-distribution of world-wide food resources, the growing evidence of climatic shift, the existence of chronic malnutrition and some starvation and the loss of arable land to bad farming practice and to building.

- 2) The second section describes the disagreements which exist around a particular issue, the reasons for the disagreements as best they can be determined and the type of knowledge which would need to be developed if agreements were to be reached. Again in the field of food one might list among other areas:

- a) the degree to which the climate is actually shifting - a technical issue.
- b) fundamental disagreements about the impacts of land reform - a values issue and a disagreement about human behavior patterns.
- c) the potentials of controlled agriculture - a technical issue.
- d) the viability of triage and lifeboat ethic strategies - a value and human behavior question.
- e) the impacts of the energy question - affected by facts, technological and human behavior questions.
- f) the growing understanding of the ecological impacts of fertilizer and pesticide intensive farming - a technical and value issue.

(Obviously the distinctions between facts, human behavior, technical and values issues is to some extent arbitrary: for example, if any issue is pushed far enough it becomes a values issue for any accepted behavior is always based on cultural norms.)

- 3) The third section sets out the scenario implications of the various models being proposed and suggests the policy measures which would be needed depending on the various views. The different scenarios can then be challenged by those who disagree with them. Thus, to continue with the global food problem there are some people who would argue that we need to take immediate large-scale measures to avoid world-wide famine and others who would argue that existing patterns of agriculture will make it possible to improve world wide nutrition without "heroic" measures. There are some people who argue that our only hope is to abandon large parts of the world-wide population to starvation and others who claim that such a stance is both immoral and ineffective.
- 4) The fourth section would state the resources available for further understanding. The most important of these resources would be the people and groups who are working on various parts of the food issue - and related subjects. In addition, print, video, audio and computer-based information would be included.

B. "Translation" of Problem/Possibility Focusers

As the previous section has shown, the idea behind a problem/possibility focuser is to create a document which reflects the

current state of the debate on any particular topic. As such it would contrast with the present situation where there is a continuing struggle between the proponents of different policy options.

An important benefit of the problem/possibility focuser technique is that it is ideally suited to take advantage of the potentials of the new electronic technologies. As we shall see later, it will be possible for the problem/possibility focuser to be updated rapidly as new information becomes available. This type of document will therefore tend to limit the problems which exist with present publishing techniques and result in most information being severely out-of-date.

However, the problem/possibility focuser would have only a limited effect if we did not deal with the different ways in which people learn. We would need to begin, as a society, to make provision for the "translation" of different types of media: this is required because the initial statement on a problem/possibility focuser will be made at a level which will not be easy for the general public to understand. We must therefore take steps to ensure that the knowledge we gain is made available to all levels of understanding from kindergarten upwards and also learn to use the various media in ways which are effective.

Moving to achieve this goal will be far more difficult than we presently understand. During the industrial era we believed that people received the message that was sent to them: that there was a tidy correlation between the teachings we aimed to make available and the information that people received. We now know that people's receipt of messages is mediated by an immensely complex screening process of the sense organs and the brain. We still understand far too little of the implications of this reality.

Some pioneering work has been done, of course. For example, Piaget has shown that there are some apparent patternings in terms of the ages at which children can learn certain skills and knowledges. Some work has been done on sensory inputs. But in general we still pay very little attention to knowledge regarding the process of translation from the sent message to the received message.

C. Uses of Problem/Possibility Focusers

If an innovation is to have a chance of being significant, it should be demonstrated that there is a felt need for it. I do not think that it is difficult to meet this criterion in this case. The frustration with existing methods of structuring knowledge, the extraordinary difficulty in conducting research, the grotesque overload of published material all point to the necessity of fundamental change in knowledge patterns.

Such a blanket statement may, however, be inadequate to vince people of the validity of the proposed approach. It may

therefore be worthwhile to point out some of the ways in which information structured along these lines could be useful to public decision-makers, private decision-makers, educators, the media.

I have already pointed out that the public decision-maker is so overwhelmed by the noise of special pleading which exists around all important policy issues that it is almost impossible for him to gain any grasp of the really key possibilities and problems in any area. Assumptions and values are hidden by a frantic lobbying effort to achieve the goals which have been set by each group. I have discovered in personal conversations, the interest legislators would have in new forms of knowledge structure which would provide some handles for decision-making.

The private decision-maker is equally in need of good information to determine the directions to which he should turn his attention. The manufacturer who continued to turn out buggy-whips long after they were a declining market is an example of a failure to reconceptualize the market in which one is active: if the buggy-whip manufacturer had thought of himself in terms of being in the transportation industry he might well have survived. My discussions with corporate planners have shown me how difficult it is to get top management to take a look at new societal directions: problem/possibility focusers could play a role here.

One of the greatest gains would, of course, occur in education. At the present time most of the material which is available - whether in print, audio or video form - is at best obsolescent and is quite often obsolete. This is inevitable given present patterns of publication. A computer-based problem/possibility focuser can, as has already been stated, be kept up to date on a continuing basis. In addition, instead of it being necessary for an individual to read or see several different presentations in order to get a perception of the extent and significance of the existing difference in views, the necessary information is all contained within a single document. Indeed, it seems reasonable to see the problem/possibility focuser as the base for the communications-era encyclopedia.

Finally, this whole approach to knowledge would necessarily have an extraordinary impact on the media and methods of reporting. The media are presently trapped into the need to report major stories in a fragmentary way. Each day they interview somebody who has a different slant on the story and they dutifully report what they have learned to their public. Unfortunately, the overall impact of this style of reporting on the reader or viewer is to leave him or her increasingly baffled.

Wholistic, large-scale stories are outside the capacity of most of the media. Even when "in-depth" reporting is attempted it is within an objective frame. The viewer is told that he is only seeing "factual material." However, there is nearly always an

implied or expressed conclusion -- a slant -- with which the public is expected to agree.

The problem/possibility focuser could alter this situation. It could provide people with an overall perception of the real differences that exist, the reasons why people disagree and could also suggest the tools people could use to be involved in thinking about their own futures.

Obviously, these patterns of mass would change the socioeconomic and political system of the country. Problem/possibility focusers would enable people to have a better perception of the real issues which face us. We pay lip-service to a well-informed democracy. Whether we are able and willing to take steps to create such a well-informed democracy is the issue which lies behind the problem/possibility focuser model and will determine the success of this mode.

D. Necessary Personal Skills

There are, of course, many possible objections to the problem/possibility focuser model. The primary question which nearly always emerges, however, is "Where are you going to find the people who are willing and able to work with knowledge systems in the way you describe? Obviously, everybody will try to distort the picture to ensure that they gain the maximum advantage."

I find this reaction fascinating. Any response to it must have several parts. First, I deny that I expect to set up a perfect system in which we shall know all that we need to know about any subject. I am not arguing that the result of a problem/possibility focuser system will be a pattern of knowledge which will answer every question we need to ask: "I am stating that it should be within our competence to determine the relevant questions that we need to be considering at this time when humanity is controlling the evolution of the earth.

Second, within this context, I state that we (all those involved) will choose the best people we can find for the initial work on any problem/possibility focuser. Obviously, the initial group will not be the final group: people will move in and out. There is no need to worry excessively about people staying when they cannot contribute because one must be working with competent people who always have more to do than they can manage and who are delighted to give up any activity when their help is not needed to make an effort successful.

Third, one will be working with people who have changed their perception of their self-interest. The group will consist of people who have recognized that their own development, the long-run success of the individuals and the institutions with which they are

associated and indeed the survival of the human race depends on fundamental changes in values and patterns toward more responsible behavior. Given this reality, it is not surprising that the people involved in the creation of problem/possibility focusers are prepared to try to understand the real issues rather than to set forth their narrowest self-interest.

Nevertheless, we must always remember that any movement toward a problem/possibility focuser format not only involves a shift in ways of structuring knowledge, it also requires fundamental changes in patterns of behavior. The shift from the industrial era to the communications era will demand alterations in perceptions and action patterns which are at least as far reaching as those which took place during the shift from the agricultural era to the industrial era. Thus, we are necessarily considering a different pattern of skills than those which were taught by industrial-era societies - not merely an extension or addition to those which are already known.

E. Computer Implications

IBM has recently taken out double-spread ads in a number of magazines announcing that we are entering the information era. I find this significant at two levels:

1. It has long been a commonplace that the bulk of the income of the rich countries is generated through the information sector of the society. For IBM to make a fuss about this point at this late date shows that this will be an effective sales point at this time.
2. More importantly, IBM is still clearly working out of industrial-era models and assuming that there are "facts" and "data" to be communicated efficiently rather than there being a need for interactive communication. As one looks at IBM realities it is not surprising that they are caught in this pattern - indeed, my experience with other computer companies shows the same difficulties - but this does suggest that it will not be the computer experts who understand or bring into existence the true implications of the technologies they have invented.

In effect, we are still treating the computer as if it permits us to do the things we wanted to do in the industrial era better and faster. We are not recognizing that computers are forcing us into recognizing new authority patterns: computer-based knowledge systems are making it impossible for decisions to be imposed on the basis of power rather than knowledge. It is therefore somewhat amazing that many people concerned about social reform and change see the computer as a block to achieving a more democratic society rather than as the prime route toward it.

This does not mean that the required transition will be easy but it does mean that if we come to accept the basis of the communications era rather than the industrial era - we shall find that our society will be forced into a democratic mode. The problem/possibility focuser will be both chicken and egg in this process: helping people to see the possibilities and at the same time providing the structure for an alternative form of society.

Indeed, I have suggested that the problem/possibility focuser will be the basis for a new form of encyclopedia: using the word encyclopedia in its basic meaning of a way of organizing knowledge. In a sense each society and culture has to find a way of organizing knowledge which fits its conditions: I am suggesting that the problem/possibility focuser is the type of format which will be needed for an on-line real-time system.

The development of a problem/possibility focuser model is urgent because of the speed of introduction of the new technologies which is now inevitable: the nation will be wired by 1984. Very few people seem to be aware of the realities or the implications of this situation and fundamental thinking is very sparse.

F. Methods of Drafting

The suggestion which follows is an idealized statement of the way in which early problem/possibility focusers can be drafted: the patterns and norms will necessarily change substantially as networks are established and the efforts are more fully computer based. It is assumed that a significant amount of face-to-face contact will be necessary for early problem/possibility focusers.

Step 1. Find a number of people who represent the various views about the issue under consideration and who are willing to work within the problem/possibility focuser format. It is suggested that the number should fall between eight and twelve in order to meet what we know about small group interactions. As already stated the group will not be "ideal" and we may well expect to see movement in and out of it. "Expertise" is not a condition for membership in the group but passionate interest and willingness to learn is.

Step 2. Bring together problem/possibility focuser creators and staff for a three day session. While work would certainly be done at this time to try to begin to understand the patterns of agreement and disagreement, it would be recognized that a great deal of the time would be taken up getting to know each other and establishing a SITUATIONAL for the group. Thus, play and games would be part of the first meeting: those people who did not recognize the need for good personal relationships in work of this sort would not be able to achieve a successful role in this over-all effort.

One possible approach for the work portion of this first meeting would be to ask each person to make one statement that she or he thought would be acceptable for the whole group. This could lead to one of two results: either there would be people present who would disagree, thus beginning to define the area of controversy or there would be genuine agreement and this statement would then form part of the agreement section of the document. Another critical goal for the meeting would be to define some areas in which staff could start to do research and think.

It would seem to be essential that one of the participants in the creation of the problem/possibility focuser could devote very significant effort to creating it so that it would be possible for him or her to work with the staff.

Step 3. If at all possible, staff and participants would be linked at all times through a computer-based telecommunications system. The contact which would thus be possible would increase both the work and the relationship potential of the group. However, the success of early problem/possibility focuser creation does not depend on the availability of teleconferencing.

Step 4. After a period of time for reflection - say two to three months - the group would come back together again. The purpose of this second meeting would be to create the first draft of a problem/possibility focuser which people would be prepared to have commented upon and criticized. If this goal could not be met at the second meeting, it would have to be put off till the third but I believe that it would be both important and possible to begin to see some written results after the second meeting.

Step 5. Comments, ideas, responses would be solicited from those most competent in the field: circulation would be kept relatively limited during this period to avoid overloading all those involved. It would be expected that it would be difficult for many people to understand the difference between the problem/possibility focuser and existing methods of knowledge structuring: efforts would have to be made to ensure that this understanding was achieved for otherwise many of the comments would be useless. During this period efforts would also be made to contact media, publishers and "translators." Further meetings of the group would take place.

Step 6. Feedback would continue. Plans would be laid for initial publication and translation.

Step 7. The problem/possibility focuser would be approved for wide-spread publication. The feedback and revision process would, of course, continue as long as the issue was important.

There is at least one other way that first drafts of problem/possibility focusers could be achieved; i.e.:

Through taking the results of hearings and showing the range of agreements, disagreements, scenarios, etc. that are advanced. I have tested out this approach using the Arizona Governor's Water Hearings in Tucson and a surprisingly large range of the critical issues surfaced. This technique would lead to a different approach during Stage 3 above: those at the meeting would be asked to react to the tentative problem/possibility focuser created from the hearings rather than start from scratch. This could be a successful technique which might cut into the longer time-lines proposed above.

Letter to Jim Smith - Attachment 2THE BABY-BOOM ECHO

We are now becoming aware of the consequences of the peak in births in the late fifties and the early sixties and the subsequent decrease so that the birth rate in the seventies has been consistently more than a million below the peak level. This "bulge-in-the-snake" is going to lead to constantly changing social priorities as different age groups become the largest one in the population.

We have, so far, spent little time looking ahead into the eighties. The number of people in the child-bearing ages has been rising consistently throughout the seventies and will continue to rise throughout the eighties. It will decline again toward the end of the century. There has not yet been an important rise in the annual number of births because marriages have come later, a significantly larger percentage of people than in the past are stating that they will remain single and desired family sizes are far lower. (In analyzing birth rate patterns, it should be remembered that there are still a large number of teen-age births, including illegitimate teen-age births, and that far more young unmarried mothers are deciding to keep their children rather than making them available for adoption.)

What is going to happen in the eighties? The number of births must rise - the real question that needs to be considered is the extent of the rise. Let us look at some of the forces that may impact the birth rate.

1. The cost of bringing up a child continues to increase. This is a substantial disincentive for a number of people. If a recession or depression should develop, the desire to keep down the number of children will be even greater.
2. Birth control and abortion information is far more widely available, although there are widespread cultural pressures to reduce this flow of information.
3. There has been a rise in "hedonism" in the seventies with more people looking toward their own personal gratification rather than thinking about how they can help others. As the raising of children is costly in terms of effort and time taken away from one's own personal desires, this too has tended to lower birth-rates.
4. There has been, at the same time, a loosening of family ties because the industrial-era styles have split parents and children as they grew up.

5. The religious base for the family has been eroded over the last century.

The impact of many of these factors may in the process of changing significantly, possibly dramatically. Certain scenarios for the future would lead to a far more fundamental religious approach to life, in which the joy of family living might again be extolled. In addition, the mobility of the industrial era seems certain to decline as the cost of energy compared to other goods and services continues to climb.

We might consider dramatizing this issue by showing different types of possible family life in the nineties. We could ask viewers to vote for which seemed most and least attractive to them. It would be possible to use a format similar to the "national drivers test" for this show. Indeed, this format might have relevance to a number of the shows I am suggesting for your consideration.

STYLES OF EDUCATION

There is considerable concern today about the educational system. A number of "objective" indicators suggest that there has been a precipitous decline in the ability of schools to educate according to industrial-era norms. Other indicators show serious breakdowns in discipline in the schools, assaults on teachers, high levels of vandalism. It is increasingly agreed that something is going seriously wrong and that changes must be made - as in so many other areas, however, there is no consensus about what should be done.

Finding new possibilities is very urgent because there is clear evidence of a type of "battle-fatigue" among teachers. The best teachers are leaving because they do not feel that they are achieving their goals.

(It would be important in this show to remind people that although declining numbers are a critical problem in many parts of the United States the education system does not face a decline in numbers throughout the country. There are geographical areas in the south which are still growing and therefore requiring new school buildings. Because of the general acceptance of the idea that managing decline is today's critical issue, these school and college districts are finding it increasingly difficult to get attention from their peers and from the institutions which should be helping them.)

As is natural, schools confronted with this pattern of breakdown are reacting with an attempt to return to the last period when they appeared to be successful. This leads to the "back to the basics" approach which has gathered so much support, at least on

the surface. Such a move might, of course, be effective if conditions were the same as they were when the schools were last successful, unfortunately changes have been so great that new directions are obviously necessary.

But it might be possible to meld some of the needed new ideas with the pressures which lie behind the "back to the basics" movement, there is truth in the complaint that we have developed more fringes around education than we can well afford. Education, along with all other parts of the society, is going to have to give up some of the luxuries which it gained in the expansive period of the sixties and learn to work more effectively with more limited resources. (The challenge is not confined to education, of course, it seems only too probable that we have built more capital stock throughout the society than we can afford to keep up given the increasing cost of both energy and materials.)

Maybe the key question for the show should be: "What are the twenty-first century basics?"

We could ask different groups in the society to set out their ideas about what educational efforts are absolutely necessary and we could again ask viewers to vote on what they saw. We could approach the Daughters of the American Revolution, the American Educational Association, a couple of classrooms of kids, teachers being trained at a teachers college, an effective Parents-Teachers Association. We could provide each of these groups with a wide range of tools for presentation of their ideas through improvisational theatre, computer graphics, videotape presentations, etc.

We could also talk to a number of people who are working at the frontiers of their disciplines. We could ask them what a kid, born this year, should learn in order to live well in the twenty-first century. What types of skills will be required? Where will the opportunities and the challenges be? Is our present educational style a hangover from the industrial era as some people claim or not? What would a communications-era educational style look like?

LEVELS OF MORALE

There have been substantial declines in the level of morale in America and indeed in almost all the rich countries of the world. This show would start with the evidence of this trend, probably presented in graphic terms.

After laying the groundwork, the show would look primarily at two sets of issues. First, what are the causes of the decline in morale. We would explain the various ways in which different types of thinkers have seen the problem.

1. There are those who believe that we have been going through a temporary time of troubles and that the morale problems which have resulted from these patterns will decrease as we move out of the current difficult period. In other words, one recipe for the future is to sit tight and to wait until the problems go away.

2. A second model would suggest that the problems have arisen because we have lost our nerve and have ceased to strive. We have not made the necessary effort to struggle for the available increase in the standard of living. Those holding this view argue that we shall not resolve the morale problem until we get back on a growth track for the socioeconomy.

3. Still others would suggest that morale problems reflect fundamental realities. It is argued that we are moving inexorably toward a collapse and that the people who are worried see the inevitability of the collapse without knowing what to do about it. Those holding this view claim that one should do as much as one personally can to prepare for the crash but that it is too late to do anything at the social level to prevent it.

4. Another group argues that the frustrations of the present time are arising because governments at all levels are unable to see the profound changes in directions which are necessary. Government should be moving us as rapidly as possible out of the high technology and high growth patterns of the past and into a situation where we can "live lightly" and in accordance with ecological realities. From this point of view, morale problems result from the recognition by the public of the need for fundamental change and the failure of the government to be supportive of the required changes.

5. The final group that we would deal with in this show argues that the central problem emerges from the confusion which exists at the present time. It claims that people are so confused that they no longer have any sense of how they can be effective either in their private or their community lives. This causes people to withdraw into privatism. This in turn leads to a sense of frustration and bafflement. One possible end result would be a search for a dictator.

The voting pattern in this program would have to be set up in such a way that people could demonstrate, if they wished, that they supported more than one of the views listed above. This would take account of the reality that people have different visions of appropriate futures when they are with different groups. This multiple schizophrenia can be highly destructive.

ACCEPTABILITY OF HIGH TECHNOLOGY

Until the mid-sixties there were few doubts in the United States about science and technology. Growth was good and science and technology were the way to achieve it. Today the situation is far more mixed. There is evidence of a significant neo-Luddite movement which aims to stop or slow the spread of modern technology - this group is named after Ludd who smashed machines in Britain in the first half of the nineteenth century.

It is often quite difficult to remember how much attitudes have changed in the last fifteen years. At the beginning of the sixties, murals at the Du Pont Company depicted smoke stacks throwing out clouds of smoke and this was seen as a sign of prosperity. By the beginning of the seventies, it was perceived as evidence that Du Pont were not ecologically conscious: the murals had to be changed.

What had happened? It had begun to be understood that the secondary and tertiary consequences of science and technology were not necessarily favorable. Technology assessment and environmental impact statements were introduced to provide a better measure of the implications which might follow from the introduction of new ways of doing things. Unfortunately, it now appears that the capacity of these techniques to provide unambiguous answers to highly complex questions is far more limited than had originally been hoped.

A number of people have therefore started to talk about "appropriate technology." Indeed there are today a number of different movements which all use the term "appropriate technology" but mean very different things by it.

For most people "appropriate technology" means far lower levels of technology than have developed in recent years. It is argued that the present levels of technology are both too complex and too centralized. It is proposed that we should find ways to live more simply and to decentralize decision making as much as possible.

This group is confronted by another which argues that the only hope for the future is the development of all the available technologies. Much of the argument on the nuclear question is at this philosophical level.

The potential synthesis for this argument appears to be in terms of a true understanding of the term "appropriate technology." We need to ask what is appropriate for what purposes at what times. Those who hope for this type of discussion no longer accept that science and technology are automatically good or that they are automatically bad. This group is seeking for new conceptual tools

which might permit society to make motivated decisions about the choices which lie before us.

The way into this show might be to remind people of what the automobile was thought to imply for the society and then to show what developments were in fact created: in other words to contrast the expected and unexpected benefits and dangers which resulted from the car's spread throughout the total society. One might then demonstrate some other possible technologies which could spread throughout the society in the same way and ask people to consider some of the possible secondary and tertiary consequences of such developments. One could also ask people when they expected certain developments to take place given varying sets of priorities in the society. Obvious candidates for these questions would be tele-communications, biological interventions and space exploration.

ECONOMIC SYSTEMS

We tend to forget all too easily that the economic system within which we now live is only fifty years old in conceptual terms and less than forty in its practical applications. Given this reality, the idea that the neo-Keynesian economic system will survive forever seems to be naive and indeed dangerously irresponsible. Keynes himself, in a classic essay entitled "Economic Possibilities for our Grandchildren," pointed out that it would be necessary and highly desirable to change the economic system so that it could be both more just and more humane. He argued that the economic system, as then organized, was necessary for his time but that it should be changed just as soon as possible.

The failures of economic planning and policy-making over the last decade have indeed proved that the present socioeconomic system is neither understood nor controllable. The harsh reality is that the tools that we now use are unsuitable for the conditions in which we live. Our methods of counting gross national product, of determining income distribution, of measuring unemployment, of considering developments in different industries are so inaccurate that we must necessarily draw wrong conclusions from the data we have available to us.

Why, given these circumstances, are we unable to generate new ideas? We are paralyzed by a model whose chains must be broken before anything can be done. The idea of full employment, which today means the commitment to provide a job to anybody who wants one is warping the socioeconomic system out of shape. It prevents us from ensuring optimum production with minimal use of non-renewable natural resources.

What is the evidence for this statement? When people concerned with increasing productivity get together they will normally

agree that as much as 25% of the labor force in many organizations could be fired without decreasing productivity. But as there is no place for these people to go, they are retained. Similarly, a growing number of educators see the college as a holding place for young people who would swamp the labor force if they were released into it.

We need to rethink the purpose of today's economic system. Our basic original idea was to produce the goods and services needed for a satisfactory life-style with the minimum amount of toil. If we maintain this goal, we should now conceptualize the goal of "full unemployment" where the maximum number of people would act in ways which they felt would improve their own lives and enhance their communities and the minimum number of people would be engaged in toil which they felt was destructive of their self-development.

Imaginative examination of employment/economic considerations is clearly urgent at the present time because the impact of microelectronics, the computer and teleconferencing is going to be far more dramatic and rapid than is presently realized. Just as the factory has been revolutionized by automation, the office and all forms of brain-work will have their basic patterns changed in the next decade. The impacts on living styles will be dramatic. (Television games and home computers are only the very beginning of this process of change.)

This program should give people different visions of the socioeconomic system in the year 2025 and permit people to vote on the ones that they liked and disliked. We might consider having the different visions produced by science fiction writers. The aim would be to broaden people's ideas and to make them aware that the world of the twenty-first century may be very different from that in which we presently live.

LAW VS MEDIATION/ARBITRATION

We have become an extraordinarily litigious society. The costs of this situation are greatly increased by the fact that legal processes rarely lead to conclusions satisfactory for all those involved. The law, with relatively rare exceptions, creates win-lose situations rather than win-win patterns.

Our continuing drift into the courts seems to reflect, at least in part, our deep pessimism about the behavior patterns of other human beings. For example, if it is suggested that a no-fault, no-lawyer divorce pattern might improve human relationships, one is reminded of the horror stories which developed because all contingencies were not legally specified.

Another difficulty with developing legal patterns is that one can be sued for practically anything at practically any time. More

and more people are therefore steering clear of situations where they might be exposed to legal liability even though their failure to become involved may reduce the possibility of effective initiatives taking place. All of us know of activities which would have been tried if people and institutions had not been advised that this might put them at risk. For example, today, all major - even minor - corporate activities are cleared by lawyers.

There is a fundamental issue behind much of this legal activity. Let us take for example, the problem of medical malpractice. (Legal and educational malpractice suits are also developing.) It is no defense to argue that one did one's best with what was available at the time. Even less is it a defense to argue that one made an honest mistake.

But we now know that striving for zero risk situations is infeasible at best and dangerous at worst. It follows then that suing people for mistakes or misjudgments will necessarily gradually reduce the willingness to take chances. This will be surely disastrous in a society which needs change.

We could start this show with some "Perry Mason" dramas which are based on the assumption that Perry is able to pull a miracle out of the hat during every show. Then we could go on to show the less glamorous and frustrating side of the law which the average citizen never really perceives unless involved in them himself or herself. We could point out the number of cases where the differences were not really "legal" but rather resulted from people living close to each other and trying to use limited space in conflicting ways where compromise is required.

We could then introduce people to the concept of arbitration and mediation and the effort made by people using these techniques to try to find "space" where everybody can gain from any agreement. We might even be able to set up a case where the viewer would be able to "arbitrate" a mock case: the results in the arbitration could be part of the feedback process on the show.

DECISION-MAKING?

People are beginning to question the types of planning which have been used in the past. These have often assumed that it is possible to determine exactly how all the steps in a process could be put together, to anticipate all the events which could take place, to make the "best" set of decisions.

There have now been enough failures using these types of planning process that real fundamental questions are being asked about the viability of the models that are being employed. For example, we act as though it is possible to plan national and world economies but every year the directions which emerge are very different

from those planned. We also act as though it is possible to determine how land use should be planned but unforeseen events continue to destroy the careful directions that have been set.

This program would try to determine whether the failures in planning emerge from the fact that people are not bright enough to use available tools well or whether the tools themselves are inappropriate for use in a complex, interconnected society. It will be suggested that "planning," as it is presently understood, is an industrial-era technique which is inappropriate in today's conditions.

It would be fun to show on the home screen the planning games which have been used to teach people the strengths and weaknesses of the planning process. We could demonstrate that very different perceptions of self-interest which are inevitable between individuals and institutions must make events uncertain. Indeed, this is merely an enlargement of Heisenberg's famous uncertainty principle which show that merely observing an event will alter it - obviously actions of people who see their self-interest affected by planners will have an even more powerful influence on events.

One response to this set of criticisms about the "planning" process has been to develop a new rhetoric which suggests the desirability of an extreme form of "participatory democracy." But just as it is impossible for experts to plan for the people in acceptable ways, it is equally impossible for people to know enough about technical issues to make good choices without help.

We need to look for a synthesis between these two extreme views. A great deal of the theoretical work now being developed in various subject areas deals with this issue. The challenge will be to present the available material in ways that catches the attention of the viewer.

We may, however, have the necessary "hook." All too many people are now well aware that there is a failure of decision-making throughout the society. A show, which promises to illuminate this issue and to suggest even the beginnings of ways to break out of this problem, might well get the attention of people at various levels of the society. The management issue is as confusing and frustrating in a small town in Iowa as it is in the Congress of the United States.

ARE THERE LIMITS TO EQUALITY?

One of the main drives of federal policy in the seventies has been to equalize conditions in so far as this can be done. Thus there is a requirement that women athletes in college should have equal possibilities with males, that handicapped people have equal access to education, etc.

It is easy to show that such a policy can have absurd results when applied in real conditions. There has been pressure, for example, to permit wheel-chair athletes to compete with runners in marathons; there have been times when the wheel-chair "runner" has won.

On a different level, the requirement that all educational establishments be open to handicapped people of all types has placed, and is placing, enormous cost burdens on educational institutions at a time when their financial situation is increasingly difficult because of the dual impacts of inflation and the decreasing population using educational facilities.

Could this type of policy be further extended? There have been arguments that recreation facilities should not be restricted to those who are hale and hearty - some of the opposition to wilderness areas comes from the fear that older, sicker people will be excluded.

On the other hand, more and more people are arguing that the costs of "equality education and legislation" may well exceed the benefits. For example, it is not clear that the blind child, integrated into a classroom with sighted people, will do as well as a child in a classroom with other blind students: always assuming that we were prepared as a society to make sure that the needs of blind and other handicapped students were treated appropriately. It is our unwillingness to commit ourselves fully to the diverse needs of various populations which drives toward an extreme "equality" model in the United States at the present time.

We must face hard choices which are based on difficult philosophical arguments. Some of the issues that we need to consider are:

Is there a right to risk and to fail? Does the attempt to make everybody "succeed" have a damaging effect on those individuals who would normally drive the society?

How much of a safety net can one build to protect the failures of the society without both encouraging further failure and preventing the success of those who are willing to strive?

Can the damaging effects of societal safety nets be changed by altering the process of education and socialization which goes on in societies? What sort of approach is needed in the United States to deal with our present conditions?

How can we make up for the effects of past injustice without causing new patterns of injustice? The inability of the Supreme Court to resolve this issue in the Bakke case shows the dangers that may develop in this area, particularly as the

white, middle-class male sees his chances limited by the attempt to promote women and minorities. The post World War II baby boom will also have significant impacts.

It is clearer and clearer from system theory that diversity - the acceptance of different life-styles and patterns and behaviors - is a requirement for a functioning society. Just as an ecological system requires a diversity of organisms if it is to survive stress, so a society requires a variety of different ways of seeing the world if it is to be able to manage the process of adaptation to change.

Indeed, there are some social thinkers who argue that one of the greatest threats at the present time is that there is too little variation in the perceptions of those making decisions about the future of the United States and the world and too little understanding that real differences in views are reasonable. The challenge of the subject will be to create ways to visualize these issues on the screen.

YOUR REACTIONS

You are asked as participants in this guide to decide how you would respond to this letter and its appendices in terms of the role you have chosen for yourself.

Is the idea feasible? Is it one that you should work with? Is it one that you can do? What proposals would you make for changes in the ideas? What are the snags? Would you opt for different subjects? Would you want different emphases? (Before you can answer these questions you need, of course, to read the appendices.)

Now, returning to your own activities, how could the groups with which you are associated in real life support such a program if it were set up? How could you help? What difficulties might you have convincing people this was a good idea - assuming that you think that it is? At what levels of the organizations you belong to would you encounter most difficulty and where would you meet the most enthusiasm?

PART V

N A T U R A L R E S O U R C E I S S U E S

INTRODUCTION

Up to the present time, we have been examining the overall context in which the subject of natural resources should be considered. In this section of this guide, we need to look at how we can ensure that better decisions are made in terms of natural resource questions.

The responses which follow are the answer to the following question which was asked of all those who attended the Conference on the Future of Renewable Natural Resources: it was also sent to some colleagues interested in agricultural questions who could be expected to have significantly different viewpoints, thus enlarging the mix of issues which should be considered in making renewable natural resource policy. The question was: "Please provide one paragraph, up to 250 words, about the problem/possibility/issue that you would most like to draw to the attention of the Secretary of Agriculture."

As might be expected, the types of questions raised are very different from each other. People are clearly envisaging different sets of problems as the key to the future. Some people believe that we must deal with the immediate pressures on natural resources which exist now and will continue to develop if we have high rates of economic growth. Some consider that we must deal with the structural issues of agriculture and forestry which prevent producers from providing resources for the country. Some believe that nothing effective can be done until the management systems in the Department of Agriculture - indeed throughout the whole society - are improved.

In dealing with this material, you may want to respond in varying ways. First, you may want to write your own paragraph (or paragraphs if you are acting as a group). Alternatively you may feel that one of the paragraphs which is already in the material expresses your point of view sufficiently exactly that you do not need to do this.

Another level at which you might want to react is to consider how you would respond if you were the Secretary of Agriculture. Obviously the various comments are so different that you are going to have to sort them out and begin to prioritize your consideration about the various problems/possibilities/issues that have been raised. While it is, of course, up to you to decide what is the best way for you to proceed, if you were indeed the Secretary of Agriculture, here is one process which you might want to follow.

But before setting this out, let me remind you what Bob Bergland said at the National Farmers Union Convention in Kansas City on March 12, 1979.

"I am here to open what I hope will become a full-scale national dialogue on the future of American agriculture. I am here to ask you to begin thinking and thinking hard about what kind of agriculture you believe would be in the ultimate best interests of farmers and the nation. And I am seeking your advice on what we should do to get that kind of agriculture.

"I ask you straight out if the farm policy decisions both government and the private sector have made in modern times - and the farm programs that implemented those policies - are still in our long-term interests."

You should not therefore assume that things must proceed as they have. The question is not if changes are required but what changes are required. How then might you proceed?

First, you could consider which vision of the future those writing each paragraph believe. Do they think that the future will be much like the past or that the primary task is to cope with a crisis when it comes or that there is a need to promote high levels of economic growth through technological innovation or that there should be a low-growth decentralized system or that the primary problems are those of management. (You may decidé, of course, that some of the authors are operating with confused assumptions about the future or that the questions that they raise would be of equal importance in several types of future.)

Once you have completed this process you will need to try to find somebody with whom you can compare your conclusions - this will be easy if you are in a meeting or if you have access to the teleconferencing version of EIES. If not, you may have to find a colleague whom you can challenge to take the time to work with you on this effort.

Let us assume that you have reached a point where you believe that you have sorted out the various types of proposals into those relevant to different types of futures. The next step is to consider what types of proposals have been left out and should be included if the most relevant problems/possibilities/issues are to be covered. At this point, therefore, you will be beginning to decide for yourself the primary issues which would be critical in the renewable natural resources area for various future scenarios.

One way to do this, in a meeting format, would be to get several teams working on the various possible futures. This would enable some concentrated attention to be given to each future and for a better picture to be gained of the specific problems which will be most critical for each of the scenarios.

The effort can stop here with a sharing of the learnings but the really important step comes next. It should now be possible

to see which of the policy issues are relevant to all the likely futures, which of them cover several futures and which are only crucial for one or two scenarios. It will then be feasible to determine the degree to which it is possible for USDA in particular, and the decision-making process in general, to hedge its bets and determine the degree to which it is essential that a decision be made as to which future(s) are likely and desirable.

It should be stressed that this last effort will not just be a case of catching up with what is known by the "experts." No fundamental work has been done in this area and it is for this reason that the American people are so hopelessly confused about the directions in which they can and should move through the next decades.

The aim of this section of the guide is to create new knowledge which will help decision-makers to see new possibilities and gain new understandings of the future. This material is not designed to provide you with a known, coherent body of knowledge about the future. Rather it aims to enable you to join in a beginning exploration of some exciting, and very difficult issues, which will determine the direction in which America and the rest of the world will move during the next fifty years.

What may be the reactions of those who work with this material? Long experience suggests that many of you may be frustrated because there are no hard conclusions which may be learned. This is not a report that leads either explicitly or implicitly to a firm set of answers to today's immediate questions.

If the material which has been presented in this guide is realistic, however, this result is inevitable. Not only are we in the middle of a transformation from the industrial era to the communications era but the new era will itself be far less structured and clear-cut. We are going to have to cope with uncertainty and risk in new ways which were largely excluded by the patterns of the industrial era.

The world we are entering is going to be profoundly different. Not only our policies but also the ways that we make policies will change fundamentally. Thus, if this learning experience is to be effective, it too must be changed.

Natural Resource Concerns

Comments

"The demand for goods and services from the nation's forests and rangelands is increasing more rapidly than the supply from these lands. This projection is based on the assumption that management of these lands will continue somewhat in the future as it has over the past years, and that population, economic activity and disposable income will continue to increase. This outlook has some important and adverse economic, social, and environmental implications."

"The United States apparently still has sufficient unused renewable resource productivity to allow a major expansion in national reliance on goods and materials provided from this resource base. However, converging forces related to energy and material needs now threaten the overuse of our forest and agricultural resource base within an exceedingly short period of time. Increasing cost for energy in all forms (imported petroleum, nuclear power, and domestically produced coal) combined with the increasing energy intensity of mining and refining nonrenewable material feed stocks will dramatically enhance the demand for forest and agricultural fiber during the next two decades. Opportunities exist for stimulating increased renewable resource productivity; these should be explored and implemented where the benefits will outweigh the combined social, environmental, and economic costs. The time is at hand, however, to design, test, and evaluate policies aimed at preventing overuse of the forest and agricultural sectors which would result in a subsequent decline in the availability of raw material from this important resource base."

"The magnitude of resource problems is not fully recognized because of constraints to full understanding of context, perspective, and priorities. If it's not a clear and present crisis it's a backburner issue.

"Let's take the problem of soil erosion. Soil scientists speak of tolerable losses from soil erosion. Tolerable loss is an amount expressed in tons per acre that a particular soil type may withstand and still continue to be productive over time. Tolerable limits or losses are seen as the price of doing business or acceptable in terms of the resource base. Soil loss tolerances are developed from something less than pure or adequate knowledge. Additionally, they are sometimes a compromise between what the soil scientist believes and what society is seen as being willing to accept.

"In spite of the accomplishments in soil conservation over the past 40 years, soil losses from accelerated erosion in the United States still exceeds tolerable limits. In the context in which tolerable limits are set, soil erosion losses are more

serious than generally believed. We have euphemistically cushioned the shock of understanding the magnitude of the problem.

"USDA's Soil Conservation Service is the agency with the primary responsibility for stopping soil erosion in the United States. The 'Conservation Operations' budget for SCS in fiscal year 79 is some \$264 million and is proposed at \$253 million for fiscal year 80. That's a mere 5% of the U.S. commitment to the Egyptian-Israeli peace accords - a dollar for Egypt and Israel and 5¢ for an investment in our own soil resource.

"In a nation historically blessed with abundance, can we recognize the coming scarcity while preventive action is possible or must we wait until scarcity is upon us before attempting to effect a cure? The answer, through the budget process, seems to be give the problem an aspirin and come back in 25 years."
- John W. Garrett

"Long term changes in productivity from agricultural and forest soils. Farm and forest production practices remove progressively more biological material from the production site and consequently suffer progressively greater loss of nutrient materials. Long term changes in soil productivity will be complexed and even masked by climatic cycles and by other long term phenomena, such as: acid precipitation, CO₂ filtering, and normal soil genesis."

"Energy Issues of Concern in the Food System -- The U.S. food system used about 16.5% of the nation's energy and forestry requires another 5 or 6%. United States agriculture is energy intensive and as a result productivity per unit of land or labor is high. This fact has contributed to low food prices relative to income.

"But uncertainties lie ahead. Energy prices are likely to continue to increase. Occasional curtailment of energy supply is likely because of scarcity of certain energy forms and imperfect distribution systems.

"The impact of higher energy prices and/or energy short falls on the U.S. food system and on food prices is of grave concern and needs to be examined. Research is needed to forecast impacts and to devise policies and procedures to minimize adverse effects. Agriculture should develop greater flexibility to substitute different energy forms if short falls develop. Technology must be developed to substitute plentiful or renewable energy forms for those in short supply.

"Agriculture and forestry as a source of energy (Biomass, Gasohol, etc.) must be explored. Less energy intensive agricultural systems should be evaluated. Processing, storage and transportation systems for food, feed and fiber should be reevaluated in the context of current and future energy supplies and prices.

Natural Resource Concerns

Comments

"The USDA needs improved internal coordination of energy programs and better external communication as well. USDA should also strengthen its energy research and extension capabilities and its relationships with other federal departments regarding energy programs." - B. A. Stout

"American agriculture is closely tied to American eating culture; the consequence is a quadruple jeopardy. It is our custom to ingest a diet which includes 40 to 45% fat; all we need is 5 to 10%. We take in an average of 600 to 800 mg. of cholesterol per day; a safe level would be 50 to 100 mg. per day. To support this eating culture, we convert grain to meat; this multiplies the agricultural land base required for our population, and multiplies the energy input required per capita. Therefore we are (1) using up our topsoil and (2) exhausting our fossil fuels unnecessarily. This senseless waste becomes patently insane when we also recognize that (3) the high fat, high cholesterol diet contributes heavily to degenerative diseases such as diabetes and blood vessel deterioration, which in turn reduces both the length and enjoyment of life and (4) costs us a bundle in health care expenses. The above states a problem; here is the possibility. A shift to a higher proportion of grain, vegetables and fruit in our diet would reduce energy consumption, reduce land depletion, increase health and longevity, and reduce health care costs. Agricultural policy could be developed to steer our economy toward these objectives; the Department of Agriculture is in a strategic position to initiate a quadruple benefit to end the quadruple jeopardy. The supportive changes in cultural attitudes in regard to diet will be more difficult." - Harding Vowles

"The public must understand the relative productivity of land farmed with smaller-sized machinery as opposed to the giant agricultural business types. Also, ownership of farmland should be readily available - so that farms can be seen as investments rather than ways of living." - Bethe Hagens

The whole world is in the throes of transition to an age of New-Ruralism. We have seen the failure of high technology to bring either equity to the most affluent nations or peace between nations. We have seen the failure of large cities to produce a quality of life acceptable to any. We have seen the failure of the nation-states to bring peace and world order. People in all parts of the World have given up faith in big government, big science, and big cities. They are now searching for a revival of local self-reliance. The future is seeing a decentralization

of all aspects of life. People are beginning to enjoy creating more of their own basic needs. Wealth is coming to be viewed as one's ability to provide for himself rather than his accumulation of ownerships. The future is becoming a two level existence in which each person is less dependent on outside forces and is more concerned with his own body, mind and soul. Nation-states fade as people and communities build non-governmental transnational bridges.

"The Secretary of Agriculture should be playing a major role in this transition which is highly dependent on new forms of high yielding small plot agriculture in 'rural cities' as well as the countryside." - Bill Ellis

"There is an opportunity offered through the implementation of P.L. 95-306, the 'Renewable Resources Extension Act of 1978', to increase and enhance production of commodity and non-commodity products on privately-owned forest and rangelands in this Nation. The Nation needs the wood, clean water, forage, fish and wildlife, recreation, aesthetics, and other benefits that these lands can produce.

"The United States has 740 million forest acres (59 percent in private ownership) and 817 million acres of rangeland (63 percent in private ownership). It is estimated that these lands are producing about one-third of their potential. Thus there is a tremendous opportunity to provide educational programs that will enable individuals to recognize, analyze, and resolve problems and opportunities dealing with renewable natural resources and the variety of products and recreational opportunities provided therefrom." - Merrill L. Petoskey

"The overriding issue involving natural resources in the country today is the implementation of comprehensive long-range land and resource management to meet the desires of the American public.

"For the 70 percent of the country's area in forests and rangelands, the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) provides the planning mechanism. And RPA, as amended by the National Forest Management Act of 1976, insures the public will participate in the planning for both public and private forests and ranges.

"The RPA Assessment of the 1.6 billion acres involved makes it clear that future needs for wood, forage, water, outdoor recreation, fish and wildlife at reasonable prices can be met with more intensive management. The RPA Program shows how it can be done. Now, an adequate, orderly and predictable flow of goods and services from the nation's forests and rangelands depends on early and sustained investment to meet future needs in an

Natural Resource Concerns

Comments

environmentally sound manner, while responding to the nation's needs now." - Office of Information - Forest Service

"Any adequate evaluation of the future of mankind, focused on the 'productive' capacity of the environment, should force people to think seriously about the terms 'renewable' vs. 'depletable' resources. The energy crisis should make us understand that our economic, political and social systems cannot be undergirded with the 'quicksand of depletable resources.' In 2 to 3 decades, most of our petroleum reserves will be exhausted. A shift to coal, even with the estimated 300 to 800 years of supply, is still ignoring the fact that we are living on an exhaustible base. Our approach to many minerals is similar. Thus, the emphasis must shift to wise management and utilization of renewable resources -- land, water, and vegetation.

"Man lives in a delicate natural balance with other organisms and the physical factors of the environment. As more people are added to the population base, as the developing nations adopt modern technology, as man continues to deplete nonrenewable resources, we move closer and closer to the ultimate limits of the environment. No one yet knows where those limits lie, but it is our responsibility, as we examine resources for food and living, to be conscious of the fact that decisions made today may be critical to future generations of mankind." - Gerald W. Thomas

"Control Data Corporation is preparing a major move into small-scale agriculture. Its key feature will be to provide data and data-processing services relevant to growing and marketing operations; the consequence will be to establish small farmers not only as permanent information-clients (dependents), but also as a 'captive' market for other production-related materials and services. If the move works, it will be a colossal theft -- for cybernetics is progressing so rapidly that the same data-processing technology and capacities will be available more cheaply, and without the other sorts of clienthood the CDC plan involves, to non-commercial cooperatives of farmers organized as decentralized networks (and also to complementary networks of food-consumers in urban areas). Decentralized cybernetic information systems hold great potentials for productive/distributive efficiency and social health, which CDC's program cannot develop fully (and will likely inhibit and distort). Yet farmers and similar groups will not be able to develop these potentials for themselves unless they are helped to understand the sudden emergence of cybernetics as 'appropriate' technology, utilizable without the high concentrations of capital and skill CDC represents; and helped to organize the cooperations necessary to develop them. Both possibilities will be foreclosed if CDC's program pre-empts the occasion.

Federal and state agricultural agencies would do well to commission adequate study of the available technological/social alternatives; and to help farmer's implement such studies' conclusions."
- Michael Rossman

"Once in the vanguard, the Agricultural Extension Service and its support, the agricultural engineering programs in the universities, have become a bastion of conservatism. Rather than bringing new and cutting edge practices to the farmers, the emphasis is on the safe and sure but often inefficient. A paradigmatic example from the past is hybrid corn which extension fought. Currently, it is solar energy and bioconversion technologies. Even the FmHA is having trouble promoting energy from within the USDA. While the universities and the research centers are hedging to cover themselves, FmHA is struggling to find ways to allow the more progressive farmer to finance these pioneering ventures which are crucial to our country's continued prosperity.

"Nature promotes diversity to maximize stability and survival, not production. Mixed farming, as exemplified by the small family farm, paralleled this model. Solar and bioconversion technologies can strengthen and promote this activity without high technology and the past capital intensive models. These mixed operations with anaerobic digesters and alcohol plants will bring to fruition the concepts exemplified by Amory Lovin's "Soft Energy Paths". They are diametrically opposed to the concepts promoted by the USDA's Agricultural Extension and the present "agribusiness community" which operates on capital and energy intensive models." - Tom P. Abeles

"There is a continuing need for the strong cooperative relationship which characterizes the 'USDA-Land Grant University System.' The Cooperative Extension Service and the State agricultural experiment stations are funded in part through formula funds by the Smith-Lever Act and the Hatch Act respectively. They require 'matching' funding from State and local sources. A major problem is to use innovative thinking to improve the relationship and to assure adequate responsiveness of State units to national goals and vice versa. All of the parties to the system need to be involved in setting priorities." - C. Beer

"It would be a step backwards for conservation, forestry and public use of our national resources to transfer the Forest Service out of USDA into a new Natural Resources Department. Our cumulative energy would be much better utilized in strengthening the Forest Service and its traditional effort to carry out its many missions." - Hyde H. Murray

Natural Resource Concerns

Comments

"Situation: An expanding world population will significantly increase domestic and global food and fiber needs. Present food and fiber production - consumption patterns are based on technologies that use significant quantities of non-renewable resources. The use of present technologies to meet swelling future demands will have increasingly negative environmental consequences and/or treatment costs. In the past, man's ability to meet such new and/or increasing demands has depended on his ability to adapt - to change.

"Problem: The extent to which domestic and global institutions can change to meet the above situation is questioned. More specifically, the ability of the USDA to change its own policies and programs to positively influence domestic and global institutions is questioned. Although change will no doubt take place, the timing of such change is critical and questionable. Can man, his institutions and, more specifically, USDA change enough, and in the required time, to meet future needs without severe human and/or natural resource destruction?" - David Ostermeier

"The problem which will require the most creative leadership within the Department and its agencies is the changing of entrenched procedures and programs to respond to futurist thought. This is much more than making individuals aware of the range of possible futures. The institutions within which the individuals work must be changed to not just allow, but actually encourage these individuals to act on their new awareness. One of the factors holding back action to be overcome is the upper management time-frame, where most energies and resources are devoted to day-to-day crises. Next year's budget becomes the long term, and the budget after that seems like the distant future. The leadership of the Department must take time to examine the future, and then develop strategies for including the future in programs and day-to-day decision-making. The tendency to make important decisions, such as budget allocations, along functional lines and according to historical shares must be fought even harder than it is now. Budget and program analysts must be forced away from their limiting assumptions to work in a world where major changes will take place in the future. We must be willing to say 'I don't know, and I can't find out now.' Having said it, managers must act recognizing this uncertainty; striving for a desirable future, but being prepared to respond to a number of alternative futures. Action oriented programs and managers will have to be convinced that they must examine the timing of their decisions with as much care as the decision itself. It will be hard for some to hold back on the tendency to settle issues once and for all, and instead live with uncertainty and conflict in order to protect future options. In short, my belief is that as much effort and creative leadership will be required to decide what to do about the future and then making it happen within existing institutions,

as will be required to make people aware of futurist thought and to discover the possible futures we face." - Ed Thor

"There is a constant, continuing clash over the short versus long run, over present needs over future requirements, and personal needs versus those of society. It has always been thus and always will be. Every examination of the past shows the lack of likelihood that it saw the future well or clearly. But man continues to hope and search for it is a part of his make-up. Small shifts in society's direction are to be preferred to large and massive changes because corrective action can be more readily achieved. In the span of man's existence this past century has been one of those periods of massive cataclysmic changes - walking man reached not only every corner of this globe in a few hours but even into space, fossil fuels and machines changed his whole capacity to alter his life. And he did. Peoples bind together into Nations and their well being is both independent and interdependent of the rest of man. In the long run, Darwin's principles will determine how we fare and in the short run private and public leaders will have a modest impact. Each generation will thus jiggle the current course and in doing so will affect the future. Forecasting the future is well nigh impossible. Harnessing the billions to march toward a perceived desired future is confounded by man's inability to see it - or even agree on what it may be. But man will persevere." - R. E. Wolf

"I see the 'management of uncertainty' based on the expectation of the unexpected as one most critical problem. Forestry policies, planning, and practices, largely, have been based on an assumed future certainty. Natural disasters including fire, insect and disease attack, 'harvest' as much timber as commercial logging. Economic fluctuations affect the highly elastic supply and demand for timber. Major social values had to be brought to legal action before the need for change in policy: planning, and practice was recognized. As we approach fundamental questions such as 'how much of the world's land area should be dedicated to forests and how much of that land should be preserved for natural ecological succession', we recognize issues which are affected by uncertainty. They include: the balance between needs of future generations and requirements of the present world population; the balance between global and national needs on one hand and local community needs and desires; the balance required to work at the cutting edge between economic growth and the quality of life. Scientists working on theory and concepts of managing uncertainty need to be recruited into forestry. Uncertainty consciously must be brought into planning models and into considerations of policy and practice. The 'Futures Challenges'

Natural Resource Concerns

Comments

workshop and its follow-up are first steps, though obviously they represent far less effort than the complexity and immensity of the problem dictate." - Keith Arnold

"The United States Department of Agriculture needs to develop a full blown analysis of the potential contribution the nation's commercial forest and rangelands could make towards solving an array of national problems and meeting certain national needs -- for replacing high process energy requiring non-renewable industrial raw materials; for providing a higher level of exports -- particularly pulp and paper to Western Europe and perhaps China; for replacing non-renewable fossil fuels until such time (if ever) that fusion or some other ubiquitous and inexpensive source or sources are developed; for providing low supplemental energy requiring forage for livestock; for providing employment in rural areas and for young people in YACC and Job Corps. This should be done at several levels of investment and intensive type of management with attendant schedules of costs and benefits by sources." John Gray

"The United States needs to develop and publicize a long-term, comprehensive national agricultural policy. This requires the formulation of goals, the recognition of problems, and the design of consistent strategies. The policy must be broad enough to encompass issues ranging from land use planning to nutrition and recreation. Furthermore, it is imperative that such a policy be firmly rooted in the political-economic realities of the increasingly interdependent world of today and tomorrow." - Richard Drobnick

"No more significant problem exists in the area of public natural resource management than the need to relate public resource agency program development to alternative futures. Public investments in resource programs are necessarily long-term, and are directed toward some set of assumptions about the future. Once implemented, such programs are often irreversible. Therefore, it is of paramount importance that programs be developed in response to a clear set of goals that are related to realistic assumptions about the future. This future must be evaluated and program goals defined before action programs are initiated. Future scenarios must be developed to guide organization of natural resource management plans and programs. Such scenarios should be developed for low, medium, and high levels of optimism and assumptions on the future human physical and social condition. Given these alternatives, programs should be developed to respond

at some minimum need level, while preserving the resource and future management flexibility to realistically accomplish this long-run approach, the function of 'futures thinking' must somehow be built into the management organization. Sufficient resources and autonomy must be given this function to allow development of scenarios that are free of political pressure. Once completed, such scenarios should serve as a basis for beginning program development; not as the ending point as is too often the case at present." - Robert E. Buckman

"There is a compelling need to devise means for coupling the four year cycle that governs the world of the politician and the much longer cycle of at least 20 years that must be taken into consideration in the planning of resource supplies and use patterns. The Resources Planning Act is a start in that it does have a minimum cycle that is longer than four years. However, memories are short, people are fickle in their interests and concern when the pay off or the predicted disaster is a long way off in time or place. We need to institutionalize constancy of purpose in the resource planning process. It is not only a future challenge, it is a now challenge.

"Lacking improvements in the process we meet three big scarcities, scarce food, scarce energy and scarce materials just that much sooner when our chances of solving the scarcities will be that much less."

"The Department of Agriculture, consequently the Secretary as principal responsible officer, has no reward structure within the department's bureaucracy to promote or stimulate any kind of futures orientation or risk taking. To examine the future, and to attempt to seriously engage it, is risky. Yet the bureaucratic rules operate to preclude, forbid, or punish risk taking. The case with almost every major agency is that 'no good deed will go unpunished'. Until the Secretary is prepared to deal very directly with that question, attempts to engage the future and deal with change are empty aspirations or superficial gestures." - Joseph F. Coates

"The story is told of an earlier Secretary of Agriculture, Orville L. Freeman, being briefed on what was ahead for the decade of the 1970's. Many pressing problems that would require the Secretary's personal attention and decisions were outlined. These included commodity supply and demand, prices, foreign aid and international trade, rural development and obviously many other important problems.

Natural Resource Concerns

Comments

"One esteemed long-term counselor, Dr. George Selke, was reported to have advised that of all the directions that resulted from the Secretary's actions those related to strengthening the renewable natural resource programs of the Nation would be longest remembered. He also predicted they would bring the Secretary the greatest honors because creative conservation would most benefit those generations that follow--we who now have leadership roles and responsibilities have that obligation.

"As we near the decade of the 1980's, we believe the major thrust should be implementation--getting things done.

"The 1970's featured a heavy emphasis on planning and programs that helped people organize and decide what was needed to maintain and conserve resources. In the 1980's, the impetus must shift to helping people organize their time, talent, energy, and money to accomplish their goals. Conservation agencies and organizations with whom they work must address this task.

"The shift from planning to action requires new attention to how we can better organize ourselves to accomplish tasks. The technical answers are not all known. Far from it. But many known answers are still not being applied. We must address the question: 'How can we better accomplish that which we know needs to be done?'

"This switch from planning to action will require a hard look at government organizations at all levels. Which level does what best--and at the least cost? How do we decide what are truly national problems requiring Federal action? How can state and local governments cooperate in solving national problems without being swamped by the size and complexity of the Federal establishment, and without losing responsiveness to their own citizens?

"Therefore, there must be a higher national priority for the conservation of the Nation's productive soil and water resources. Conservation is essential to maintain the resource base to meet our long term food and fiber needs, fight inflation, meet environmental goals, maintain a favorable balance of trade, protect our national security, and maintain our standard of living." - Norman A. Berg

BIBLIOGRAPHY

If you become interested in futurism, it will not be difficult for you to find additional books, articles, etc. to study. Thus, the purpose of this single page is merely to provide you with a few starting points for further discussion and thought.

Future Shock. Alvin Toffler. Random House, New York. 1970.

I am fairly certain that if a list of citations were made of how often various books appear in the literature, Future Shock would win going away. It is the futurist book which the general public has read and the one which it still makes sense to start with.

The Next 200 Years. Herman Kahn, William Brown and Leon Martel. William Morrow, New York. 1976.

Herman Kahn is widely seen as the individual who promotes the high-technology, high economic growth scenario. This book will give you a sense of what a highly intelligent, optimistic vision of the world can be. This vision is still seen as attractive and feasible by a very large number of people.

New Age Politics. Mark Satin. Whitecap Books, West Vancouver, Canada. 1978.

A fundamental critique of the present patterns of operation of the present set of socioeconomic patterns in America and throughout the world. The subtitle of the book: "The emerging new alternative to Marxism and Liberalism" suggests the overall tone of the volume.

Prospects for Growth. Edited by Kenneth D. Wilson. Praeger, New York. 1977.

A number of "authorities" put forward their views about the patterns and limits to growth in coming decades. Sponsorship of this volume by the Edison Electric Institute, and the wide range of views which they were willing to include in this publication, makes the book worth careful reading.

Futures Conditional. Edited by Robert Theobald. Bobbs-Merrill. 1972.

This volume uses science-fiction, cartoons, poetry, etc. to show why there are different views of the future and what the implications of these views may be for ways of behaving.

APPENDIX I

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131