

*Technology Assessment: Creative Futures:
Perspectives From and Beyond The Second International Congress*
Series Volume 5
Prepared by Mark A. Boroush, Kan Chen, and Alexander N. Christakis
North Holland Press, New York, 1980, pp. 240-260, references pp. 306-311

Chapter 4: Method: Perspectives on Doing and Using TAs

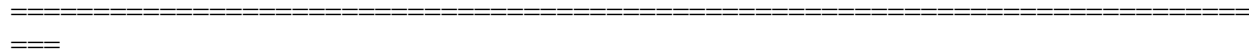
**4.2 PERSPECTIVES ON THE ASSESSMENT
OF SOCIAL IMPACTS**

Editors comments:

The importance of the social dimension—the political, the cultural, the institutional, the legal—in assessing the long-term effects of technologies has been recognized from the earliest stages of TA.
p. 240 II. Technology Assessment at the Second International Congress

The interest in the topic has grown considerably over the past several years. A parallel idea of "social impact assessment" appears to have gained an identity unto its own (Finsterbusch & Wolf 1977). It is particularly significant as well to note that within many circles "environment" has come to mean the experienced social field as well as the physical and the ecosystemic. Yet the development of methods to measure social impacts continues to remain quite problematic. Just as the appropriate way in which the analysis of the social dimension might best be codified into a science has remained a topic of considerable dispute for over half a century (Frankfurt Inst. for Social Research 1972, Riley 1974, Winch 1958), many of the same issues fall squarely on the development of the means to do social impact assessment. In consequence, the growth of the useful assessment of social impacts with TA hinges on the resolution of problems that have proven to be conceptually very difficult.

A series of ideas and viewpoints on the state of social impact assessment were developed in a number of the Congress sessions. The following presents the commentaries of Peter Jessen and Peter Miller on the topics of TA, social impact analysis, and the social dimension.



Editors' abstract of Peter Jessen's paper

Peter Jessen examined the features and interplays of technologies, impacts, assessments, and planning in the social dimension during his presentation in the "Social Impact Assessment" session. His lengthy and wide-ranging remarks emphasized the importance of recognizing how value-laden are the outlooks and interpretations that direct inquiry into the social sphere. He offers a series of recommendations toward the genesis of a social impact assessment methodology that recognizes these inherent subjectivities and their relevance to future social decision making.

We need to address two theses regarding unintended consequences of technology in any TA or social impact analysis (SIA).

1. Unintended consequences will always result from implemented policies, no matter how rigorous the TA's used in the decision making process by those ultimately responsible for doing so. This is as close to a social "law" as we can come.
2. A particular kind of ethics of assessment, the elements of which will be presented later, can contribute

to minimizing the negative social aspects (i.e., "painful" societal and individual disruptions, physically and/or cognitively) and can maximize positive impacts (i.e., "meaningful" to the society and individuals involved).

To attempt to create a better future, to try to predict what will happen when new technologies are introduced into society, to assess in an anticipatory mode, is almost to deal in the legerdemain of creating a fabled social science crystal ball. It is truly the "new frontier" of intellectual thought, the state of the art of which is dynamic to the point of being "explosive" in its development (Wolf 1956).

My focus will be first to assay the predictive enterprise itself and then to suggest a matrix by which the concerns and meanings of people might be studied within the framework of the mechanical templates of technology. I will then briefly discuss a General Systems addition to our methodology and finally an outline of how the predictive enterprise might be enhanced by carefully dividing the levels of implementation in the body politic of both the anticipatory and evaluative aspects involved.

Caveats regarding the cornucopia of methods and promises (predictions) about what different methods can and will produce should be addressed. They do not arise from negativism, but they rather reflect our willingness to admit to the need of tissue with which to clean the specks and dirt off our various lenses of perception as we attempt to deal with social reality, technology, prediction, and the unintended consequences that are missed along the analytic road to "a better future for humankind." What Weber and Merton call the "unintended consequences" of plans and/or actions parallels what Jay Forrester calls "counterintuitive thinking" (Forrester 1971), and that which Moore would articulate as the need for being able to "predict discontinuities in social change" (Moore 1964). All of these points are important to keep in mind when we discuss methodological approaches for dealing with the tension between short- and long-range planning. We can do so by exchanging the Platonic dualism of "either/or" for the more flexible "both/and."

The question before us, as we seek to improve anticipatory research, is that of how technology assessment, social impact analysis, social indicators, etc., can be used to promote gains in the quality of life (QOL). How do we define good quality of life? How can we create a society that is just and effective for all its members and still remains viable in the world community of nations and within the ecosystems of the planet Earth? It is within the context of these questions that we begin our journey toward an understanding of how a "better future for mankind" might be perceived and developed.

Technology assessment and social impact assessment lie at the crossroads of tension between the value-free (properly translating a modern problem in technological and human terms) and the value-laden (implementation consequences: bridging the gap between findings, policy recommendations, and political actions to carry out the policies).

At the outset, we must admit to certain key limitations. We must not fall into Durkheim's cul-de-sac, in which he believed that science can tell people how they should live and societies how they should be organized, nor into Marx's, in which he believed that science can tell humanity what its future is. Do we then abandon the predictive enterprise? No. What we do is sharpen our reflexes to be better prepared for and more humanely sensitive to the resulting unintended consequences.

Thus, the task is to sharpen our methodologies so that our subjectively conditioned frames of reference are followed by procedures of universal validity. The task is also to utilize those two inexorable parts of modern society, rationality and bureaucracy, which are valueless in isolation but which can be used to liberate people rather than turn them over to the "prince." Hence, we must manage our values in the midst of our scientific analyses.

Underlying my discussion is the recognition of the empirically verifiable reality that there is no real alternative to the megastructures of modern human society, nor to the bureaucracy and technological rationalization accompanying them. Most of us would die without them to provide food, energy, medicine, and the life-styles that enable us to live off our minds and not just our hands.⁷ The task becomes one of ascertaining the limits of technology and the limits of being able to assess that technology vis-a-vis the values and meanings of the individuals who make up society as a whole and the possible linkages between the megastructures and the people at the local levels of society (i.e., communities and neighborhoods).

PREDICTION, ANTICIPATION, AND ASSESSMENT

Much work has been done over the years attempting to solve the perplexing riddle of prediction. Not until recently, however, has there been such a willingness to at least entertain the idea of breaking out of the Cartesian categories that disdain values and humanistic insights—such categories as total commitment to objectification and the linear reductionist, inductive, rationalistic, quantitative, logical, positivist forms of cognition (Henderson 1975).

Values are far from being peripheral concerns. Indeed, they are the "dominant, driving variables in all human systems, whether technological or social" (Henderson 1975). In other words, we professionals who use only the narrow, specialist training of sterile quantitative methods, without taking into consideration the qualitative aspects and the broader understandings and insights of citizens regarding their world view in their own situational complexes, cannot adequately define the problem and therefore cannot adequately provide prognoses to accompany our diagnoses.

By definition, to "seek a better world" is as much to deal in public policy as it is to postulate policies and a vision of the world in which such policies should be established. At that very point we are value-laden and are deeply involved in politics, although many would deny that reality by stating a different reality definition, namely that of being involved in objective policy science.

Weber believed that the scientist qua scientist could evaluate the probable consequences of courses of action but could not make value judgments about them and thus could not offer an answer to the Tolstoian question of "What shall we do?" Those involved in such tasks as TA, SIA, QOL assessment, etc., are making a fundamental break with that notion. Time has not yet judged the value, effectiveness, or correctness of such a bold move.

Strictly speaking, prediction refers to "assertions about future outcomes based on the observed regularities among consecutive events of the past" (Scheussler 1968). But TA and SIA are different. They immediately become unscientific when they become part of the public policy domain, for predictions are potential instruments of social action enabling a group either to facilitate or impede an outcome deemed either favorable or unfavorable, tolerable or intolerable, positive or negative, desirable or undesirable (as many of the scientific studies and experiments of the Third Reich so ably demonstrate).

Although predicting the future has been a goal of human beings throughout their history, each generation trying to produce its own oracle, the first "scientific" attempt to foretell trends of the future through analysis of technological innovations was that of Ogburn in the 1940s; he attempted to ascertain the social impact of aviation (Ogburn 1946) [also he had earlier dealt with the subject in the 1920s in a more theoretical framework (Ogburn 1934)]. It is interesting to note that although the 1968 edition of the *International Encyclopedia of Social Sciences* discusses prediction, including Ogburn's work, there is no reference to technology assessment or to social impact assessment as we are discussing it at this Congress—more evidence of the "new frontier" of knowledge in which we are engaged (Scheussler 1962, p. 418).

⁷From remarks made by Peter L. Berger to the "Sociology of Knowledge" Seminar, Rutgers Univ., New Brunswick, N.J., on May 19, 1976.

Although one of the concerns fostering the development of sociology was prediction, few empirical studies have been specifically concerned with producing prediction, partially because of the "uncertainty of American sociologists over their goals and priorities" due to the tension produced between models based on physics (scientific laws and prediction) and history (social and political movements and implications for social planning) (Scheussler 1977).

Over the years we have moved from Moore's "discontinuities" to Schuessler's "continuities" in social prediction. The attempt to predict has been an integral part of the work and study of those trying to ascertain what the results would be to people and to society as a whole of new technological and organizational inventions and innovations. But, as Schuessler points out, the dearth of forecasts and the underdeveloped state of forecasting are due to the nature of social change, the problems in measuring social change, and the absence of dependable indicators or variables whose change is in question (Scheussler 1968, p. 310). The statistician would point out that predictions about alternatives of choice are all well and good, but that the probability of accuracy is going to be determined by the values employed in setting up the model to be determined by the values employed in setting up the model to be used in the anticipatory research design and enterprise (Scheussler 1968, p. 312).

Much of the predictive focus between 1920 and 1950 was based upon personal adjustment in specific social situations (Scheussler 1968, p. 324). The various models of social process (whether by probability chain or linear equations) have not produced much in the way of predictive knowledge up to the beginning of the 1970s. Berelson and Steiner inventoried findings in 1964 in an attempt to provide "valid generalizations to explain and predict the actions, thoughts, and feelings of human beings (Berelson & Steiner, 1964). Much of their information does not deal with technology, but it does give many insights into how people will respond given certain situational changes, providing a reference, at least, for extrapolatory prediction in anticipatory research, especially in the section on social change. Finally, in 1961, Nagel noted that "in no area of social inquiry has a body of general laws been established, comparable with outstanding theories in the natural sciences in scope of explanatory power or in capacity to yield precise and reliable predictions" (Nagel 1961).

This brief overview sets off, by contrast, the remarkable development in the efforts to deal with the predictive aspects under discussion in the 1970s.

My concern is to contribute to the sharpening of our awareness and insights into how to deal with what Shields calls "people impacts" of anticipatory research (Shields 1975, p. 260), particularly as we seek to inform public decision making and as we follow the quest to advance our knowledge and understanding of society. As Land and Spilerman have noted, the rationale behind social reporting is the prediction of future social events and social life (Land & Spilerman 1975, p. 14). They offer us a social life cycle and life space attributes paradigm; but, except in the abstract, they do not really include values of specific individuals, only of society as a whole. The problem of explaining without being able to predict future events and of being able to predict without being able to provide any understanding of the causal processes involved is still with us (Spilerman 1975). Thus we still grapple with demographics, institutional displacement and relocation, economics (incomes, employment, and taxes), community cohesion, and life-styles (Shields 1975), as well as such possible unplanned impacts as costs of planning, concentration of services, high school divisions, and other educational problems, two-way traffic flows, participation myths, incomplete assimilation, exclusivity, etc. (Kelly 1975).

Laughing at us all the while are the muses of knowledge, who know that knowledge does not dictate which policy will be the most effective in solving even very specific problems, even though knowledge is

relevant to decision making (Lazarsfeld & Reitz 1975, p.45). This brings us back once again to the definition of the situation and the consequences of that definition, as "the preliminary assumptions which one makes concerning the nature of the data that any given science investigates determines not only the kinds of interpretive hypotheses which can be verified, but also the rational and empirical principles and processes which must guide scientific inquiry" (Jensen 1968).

Bronowski underscores the need for better predictive and anticipatory skills when he reminds us of what we know all too well: The side effects of technological innovation are more influential than the direct effects, and they have the rippling effect of a pebble hitting water; they spread out in ever enlarging concentric circles throughout a society to transform its behavior, its outlook, and its moral ethic. What we often fail to recognize in all of our deliberations, even those concerning values, is that "morality is an organization of life that grows spontaneously from activities and not a formula taken ready-made from somebody else" (Bronowski 1969).

What about these unintended effects? Merton (1968)⁸ calls intended action the "manifest," or anticipated consequences, and unintended action, "latent" or unanticipated consequences. The former are the official explanations of a given action (the content), while the latter includes a sociological explanation of a given action (the process) (Cuzzort 1969). This relates to both social and technological innovations or to social change fostered by the organizational changes of a given technology or interaction of different technologies. For example, the Protestant ethic, with its ideal-typical expression of the value attitudes basic to ascetic Protestantism, was a collectively held cultural value that gave rise to two concepts otherwise inimical to its basic manifest intent: capitalism (as in Weber's analysis) and science (as elaborated in more detail by Merton from Weber's more sketchy comments). Here the unintended consequences are those of an idea. Yet those latent functions would later under-score the acceptance of science and technology in such a way that for a long time they would not be critically assessed, either in evaluative or anticipatory modes, a wholly unanticipated consequence of the scientific ideal itself.

There are numerous examples of how our values unexpectedly influence outcomes we have not anticipated. Quite often we then use cognitive "gymnastics" to legitimate the unintended outcome, even though it is theoretically in opposition to what was originally stated or believed, causing a kind of transformation in our own minds, so that we see the consequence as other than it really is. For example, propaganda campaigns designed to solicit money for political candidates clamp subtle constraints on democratic political ideology. From fears of the loss of freedom come repressive measures to assure that liberty will be preserved (as witnessed by the "Houston Plan" of the Nixon administration and other such activities well documented and known by now, many now revealed as being *de rigueur* in American foreign and domestic policy for much of this century). The "manifest" function of antigambling legislation "latently" creates illegal empires for gambling syndicates. Christian missionaries bent on converting the heathen wind up helping to destroy the indigenous tribal cultures. In Russia, the Communist Party's control of all sectors of social life is "manifestly" to assure the continuance of the revolutionary ethos and the Marxist-Leninist world view, while "latently" creating a new class of comfortable bureaucrats who are not only bourgeois in their aspirations, but who are increasingly disinclined to-ward the self-denial of Bolshevik dedication (Berger 1963). The same process occurred in China, where the cultural revolutions of the late 1950s and later 1960s were to combat similar tendencies—tendencies we might predict will gain ascendancy in the post-Mao era.

As we attempt to hone our assessment skills, it is important that we consider the various "lenses of perceptions" involved, including those of the assessor, the assessee, and those who will make use of an assessment in the application or implementation stages. These hidden functional aspects we've just discussed must be considered also. Such considerations move us into the arena of ideology and the sociology of knowledge, an approach that can be used to analyze the ideas by which people explain their

actions. It is also a humanistic question to inquire into the latent functions of the men and women who pursue the quest to identify the latent or unintended consequences. The question is thus double-edged: Do the people thus engaged in the task of assessment, questions that follow from the

⁸See especially Chapter III, "Manifest and Latent Functions."

purpose of this Congress, to seek "a better future" for humankind, jeopardize or threaten the tenuous hold that official interpretations of reality have on the members of society and thus contribute to the dissolution of the social bond (an unintended consequence of the anticipatory research mode itself)? How can we positively aid in the development of insights into the understanding and comprehension of our most serious irrationalities?

These remarks may seem far afield to some, but they are at the heart of our task. How we view the direction of society will be how we interpret what we are analyzing vis-a-vis policy formulations and recommendations. This follows W. I. Thomas' conclusion that however a society defines any given situation, whether that definition is correct or not, the consequences will be real.

As Sheldon Wolin has pointed out (Wolin 1960), much of what passes as "predictive knowledge" is better viewed as a "product" created and processed by organizations that attempt to legitimate their product as "real." Such organizations are not communities but structures of power and interest (be they General Motors or the National Science Foundation). Quite often, such modern predictive knowledge, as Wolin again reminds us, is often in the form of concealed political instruments appearing to be scientific as they dress in the clothes of mathematics.

And although predictive knowledge, especially surveys and opinion polls, can be accurate for the very short run, their reliability when extrapolated over time vanishes. Yet we use the short-run knowledge as a definition of reality and make long-term plans with it. Indeed, social scientists over the years have made gigantic errors in prediction, because of this continuing myopia of equating the short-term "reality" with the long-term "reality." Thus, we have been treated to such pronouncements as the following:

The fundamental problems of the industrial revolution have been solved. Bureaucratization means a decline of the arbitrary power of those in authority and more freedom.

In 1962, not long before the incident in Selma, Alabama, and the movement sparked by that incident, Paul Lazarsfeld, the dean of American sociological methodologists, announced that the data showed that the black-white race problem in America was over.

All of this forces us back to the question: What is reality in public affairs and in personal relations? Reality is more than we think and more than we can imagine. It is a questioning of axioms; it is going beyond prudence; it is inconclusive and can be the basis not only of despair but of hope. If we can take the risks of creative imagination and action, it can become an area of the possible. We can enlarge our perspective to make the humanly possible real (Lynd 1975).

AN ETHICS OF ASSESSMENT

All of this has important ramifications for our Congress' stated purpose of helping to foster and develop a more adequate methodology. This is crucial, for methodology implies ways of approaching problems (ways variously referred to as *modus operandi*, tool kits, rules-of-thumb, overall bias, etc.), "rather than a comprehensive doctrine or *summa* of universally applicable principles" (Hardin 1973). If we are to pursue a humanistic perspective, our methodology should be "open-ended, always subject to revision, operative

'until further notice,' " and be, in a word, "a safeguard against rigidity in thought or practice" (Oka 1975).

Therefore, one of the tasks as professional social scientists that we might consider as we work to refine the methodologies of TA and SIA is the development of an ethics of assessment. This leads us into the arena of moral responsibility, which, although beyond the purposes of this paper, is the context within which it is written. It would do us well to occasionally reread Max Weber's distinctions between the "ethics of attitude" (also translated as "ethics of absolute ends") and his "ethics of responsibility." In the former, it is the moral attitude of the actor that is important, not the consequences of his actions (e.g., the American statement about Hue, South Vietnam, that "we had to destroy the city to save it"). The latter is the so-called dirty hands approach, requiring theoreticians to come down from their ivory towers to seek to effect the most humane consequences possible in the difficult choice between competing alternatives. I recommend to you Peter Berger's

new book, *Pyramids of Sacrifice: Political Ethics and Social Change*, in which he outlines a humanistic approach for pragmatic analyses: i.e., he offers us a "calculus of meaning" and a "calculus of pain," which he uses to marshal his argument and evidence for asserting that policy decisions, from a moral perspective, should be long on meaning and short on pain, anywhere applied (Berger 1974), be it in the first, second, or third worlds, or in what are now called by some the fourth and fifth worlds, the location of the "bottom billion" (Time, Dec. 22, 1975). The elements of an ethics of assessment are listed in Table 4.8. These elements are important to our assessment enterprise, for, as Berger illustrates, despite the long-held fashion of fostering the posture of detachment as scientific observers, the very personal aspects of assessing the social impacts of technology and corresponding social changes cries out for both reason and passion (Berger 1974, pp. 198, 215, 227).

TABLE 4.8. Elements of an Ethics of Assessment"

A pragmatic calculus

- Calculus of meaning
- Calculus of pain

Pragmatic nay-saying

- Saying no to policies that intentionally produce or are found later to unintentionally
- produce a low level of meaning for people and a high level of pain.

No to policies with these outcomes

- Hunger
- Pain
- Sacrificing people for putative theories/goals
- Anomie of self from self and others
- Alienation of self from society and institutions
- "Homelessness" of mind
- Substituting imminent eschatologies for discontent and disappointment
- Merging political and economic institutions into one umbrella institution
- Merging public and private "spheres"
- People advocating adoption of other societies' ways in which they have not lived, and conditions under which they have not lived
- Reinterpreting evidence to fit ideology or policy

^aBased on Berger (1974).

As Berger pointedly expresses it, "All material development is, in the end, futile unless it serves to enhance the meanings by which human beings live. This is why it is so important to be careful about riding roughshod over traditional values and institutions" (Berger 1974, p. 221). It is easy to see, then, why nationalism is so abrasive to many non-Third World analysts; yet, for those in the Third World, it serves as their brake against outside influences as they seek to protect their traditional values. In assessing the social impact of technology so as to arrive at policies regarding choices of competing alternatives, the methodology must be politically viable in order to win assent from people and interest groups with quite different ideological presuppositions. A methodology based on pragmatism and not ideology, within the perspective of the calculi of meaning and pain, provides a more viable access to the political process. Political action, as Berger notes, "takes place in a context of inadequate information and inability to foresee the future." Such an awareness underscores the realization of "the overwhelming probability that one's own acts will have unforeseen consequences" (Berger 1974, p. 223). Hence, we see more clearly the profound irony and quandary of the paradox of the humanistic assessor/planner/policy-implementer, desiring "to let others decide and of having to decide for others" (Berger 1974, p. 223), which is the case in any situation "too large for ongoing face-to-face interaction, and in which at least optimally, all decisions are based on consensus" (Berger 1974, p. 224).

Several examples illustrate this. Terrible consequences can result. The examples I'm going to use are those reflecting the near-sightedness of government planners, adversely impacting the lives of their own people. In each, the manifest functions seemed clear-cut. But the latent functions turned out to be terrible indeed, if a humanistic perspective including the calculi of pain and meaning is used in the analysis.

The first example is that of the Ik (pronounced "eek") in Uganda, a tribe of the Kidepo Valley, their main hunting ground. The government of Uganda decided to make a national park out of the Kidepo Valley. The latent function of that act is an indictment of the myopia that science can generate. This act of conservation was made outside the context of the Ik themselves, and thus their values and social location were ignored. In the process, the fact that their way of life marked the epitome of conservation, which would have added to the success of the park if they had been allowed to continue their way of life, was also ignored. A similar fate befell the Kaiadilt, an isolated tribe of Australian aborigines. Both of these examples are tellingly illustrated by John Calhoun to show the similarity of development between the mice in his crowding experiment and the Ik and Kaiadilt as they experienced a similar kind of crowding. For both, the change of venue, as we might call it, and the ending of their previous way of life "made irrelevant" their "entire repertoire of beliefs, habits and traditions." Their guidelines for life were "inappropriate" to the new situation, for their cultural templates fitted them for their previous way of life. "They were suddenly crowded together at a density, intimacy and frequency of contact far greater than they had ever before been required to experience" (Calhoun 1972).

Certainly, no one need be reminded of the social costs imposed on their own societies by Russia and China when each literally sacrificed tens of millions of their own people to forge their "better future." The telling tragedy is that people elsewhere, even in this country, dismiss the concern by stating it was worth it to establish the "Utopias" they brought into being. Again, we must think of the calculi of pain and meaning: Is it worth it, is it really practical, to destroy a city or a people in order to "save" them? In this country, we too have nightmares that rise up to haunt us, as we, in our benevolent concern, rushed to build up high-rise public housing for the poor. Creating the same kind of crowding complexes of which Calhoun spoke, resulting in needless and senseless Pruitt Igos⁹ around the country which are later either blown up or boarded up. We meant well. But we did not do well, for, as the salesman sings in *The Music Man*, "we didn't know the territory."

How might these countries, including our own, have avoided such consequences? At this point, several charts will be discussed which will be useful

⁹Pruitt Igo was an infamous low-income public housing project built in the St. Louis area in the 1950s. It received a number of architectural awards for its high-rise design. But it became increasingly plagued by crime problems after its opening—some say as a result of its design. In the years since it has become a symbol of the inability of architectural design to foresee adequately the social implications of its design.to the task we have set for ourselves: that of improving our methodologies for anticipatory research in the predictive assessment enterprise.

Figure 4.15 is the diversified people's matrix which could be useful in bridging the gap between the

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

micro and macro levels of society, insofar as the values and understandings of the constituents of each are

concerned. The matrix can be used in a wide variety of contexts (Jessen 1973). The original matrix was two-dimensional, and was developed by Wallace Hamilton for use in planning for the company that built the planned town of Columbia, Maryland. The matrix is based on the recognition that each assessor, planner, and analyst brings his or her own baggage of values, remembrances, attitudes, and hopes to the planning process. Despite the protestation of the collectivists to the contrary, we are all individuals, each with a single and unique body of experience and memory, each with a personal system of values, each with a place and role in life, each with a particular educational background, each with an ego, each with personal pools of self-respect and self-doubt, each with an intermingled group of identities, each with a particular discipline framing our concepts and ideas (Jessen 1972).

The diversified people's matrix is a three-dimensional revision of Hamilton's matrix, the third dimension coming from an idea by John Calhoun who independently used a matrix like Hamilton's, but added an existential level. In this version we are using stage in the life cycle, socioeconomic level, and cultural location. The matrix reveals 1231 different character types. In an effort to obtain the kind of information we have discussed above, to get at the root cognitive structures and understandings that help and hinder, to deal with the "reality" behind the facades, the planner and/or assessor is asked to write a sketch describing each type. Then the task is to get a comparable sketch directly from the character type (as well as their description of the assessor and/or planner), and subsequently compare the two. The assessing, analytic, and cognitive perspectives to use in assessing, analyzing, and understanding the results of the sketches are the academic disciplines (the physical sciences and the social sciences), occupational modes (government/industry/private/political/planning/ implementing), and the influence of various lifestyles (geographical location, ethnic background cultural/racial background, population density, physical size and condition of individuals, philosophical persuasion, etc.) (U.S. EPA 1973b).

Although we realize that each "type" of person in the matrix will have his or her own idea of what the "good life," the "good society" is, we will still be on firm ground listing dimensions of that good life or good society, that all could agree to, as long as we remain at a sufficiently high level of abstraction. In attempting to ascertain such a list, The American City Corporation has developed a list of the goals people have in seeking better places in which to live. These goals are to (American City Corporation 1973)

- Earn an adequate living
- Have a decent home and a good environment
- Enjoy good health
- Get a good education and have access to new skills and knowledge
- Share life with family and friends
- Participate in community decisions
- Enjoy leisure
- Enjoy personal security and the freedom to move easily around the community
- Determine for ourselves the meaning and direction of our own lives¹⁰

¹⁰Note: relate these back to the character types of Figure 4.1.5, the diversified people's matrix. Percentages, ratios, coefficients, etc., do not obscure the fact that real suffering people are involved and that the character of the interrelationships is always central (that is, if we use the elements of assessment discussed in Table 4.8). There is no way to "chi square" a feeling and make it qualify as a scientific fact. When we deal with rocks, we do not need ethics. When we deal with people, we do (again, an assumption based on the framework of the ethic outlined).

It is recognized that a number of these goals are particularly relevant to the West and to industrialized countries, but the flavor could be said to re-late to all. The difficulty of translating these goals is seen when the question is asked: What do they mean to the people listed in the matrix, and what do they mean to the constituents of the various analytic and assessment and cognitive perspectives that are listed? How does the person representing the constituency of the home and community change when representing the constituency of the office worker or plant worker or when representing the constituency of the bureaucrat, assessor, planner, decision maker, **implementer**? How can we deal with these questions in the anticipatory mode? How, to use Shield's term, can we use this matrix to ascertain the "differential impacts" (Shields 1975, p. 280) of technology and its concomitant social change impacts, for such affect different people in different ways at different times?

As we look at the matrix, we are immediately confronted with perplexing questions: How would we translate personal character sketches of others? How would we describe others' personal life situations, beliefs, fantasies, and relationships? How would we relate to their lenses of perception regarding a better future vis-a-vis housing, jobs, education, health services, recreation, rehabilitation services, socialization, transportation, communications, etc.?

The value question raised before us is that of satisfaction and fulfillment. Each "stereotype" represented by each of the boxes would have a different answer for the nine listed abstract goals (and probably a different answer from one year to the next). Satisfaction and fulfillment represent dimensions of both personal and societal lives. To consider the question, "What is life all about?", which must be done with each of the box stereotypes, means also to consider such questions as reality definitions, cognitive and normative understandings of reality, relationship of religious norms to economics, place of motivation (conscious or unconscious), effect of the matrix of norms and interest on behavior, methods of approaching the ultimate meanings of human experience and human conduct—and then to apply the "answers" to these questions in the various pluralistic settings of our pluralistic society, which is located in a pluralistic world (Berger & Berger 1972).

Although most of those in the matrix will agree with certain overarching values in the abstract (such as freedom, dignity, justice, virtue, fairness), each will differ—some minimally, other greatly, and some violently—re-garding how those values should be established and then maintained in the social systems of which they are a part.

Failure to be able to understand the pluralism of the citizenry, failure to understand the QOL standards held by the various individuals and groups will lead to continued physical and programmatic Pruitt Igos, continued lack of trust in the government, and, in a word, continued inability to anticipate the consequences of actions that are being considered and assessed in advance.

An ethical axiom we forget at our peril is that, with regard to the dimension of other areas of the world, "No outsider, including the outsider who possesses power, is in a position to 'know better' when it comes to the finalities of other peoples' lives" (Berger 1974, pp. 224-225). What happens, we might ask ourselves, when we have a vision of a "better future" that is con-fronted with the reality of choices being made, plans being implemented, etc.? The exercise of such powers is the exercise of politics. The paradox confronting us is the one crying out for an ethics of assessment.

ASSESSING SOCIAL ALTERNATIVES OPENLY

An additional aid to our methodological development, one that will help us in integrating the matrix results (its various assessment perspectives for seeking anticipatory accuracy), is that of general systems theory. Figure 4.16 outlines another method for relating the various disciplines and assessment

perspectives noted on the matrix, providing yet another method for attempting anticipatory accuracy regarding predictions as to actual consequences of given technological and social change (Christakis & Jessen 1974, Klir 1972). The notion is that there are many policy bundles competing for favor, not to mention reality definitions (lenses of perception). Each is based

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

on a different understanding of reality, much like the six blind men describing an elephant from the different vantage points of the trunk, tail, ear, foot, side, and tusk. Hence, each represents a "truth." Each must be assessed in terms of the extent to which anticipatory research will provide problem cluster resolution(s), a process that must be iterated and reiterated until a reasonable problem cluster resolution is obtained. The key concept is "lens of perception," for that is one's "world view" (Table 4.9).

Yet, a difficulty remains. Each of our two charts (Figures 4.15, 4.16) includes many boxes. The problem with boxes is that we tend to solidify, to concretize them, at which point they lose flexibility; or, from the planner's side, the people remain frozen in our minds even though they continue to

TABLE 4.9. Orders of Perception³

Each of the following is a function of lower-order perceptions. They are listed hierarchically, from lowest to highest:

- I. Intensity: Magnitude of stimulation of sensory, receptor; energy flow
- II. Sensation: Quality of intensity; vector
- III. Configuration: An object, pattern, arrangement, or invariant of the present moment
- IV. Transition: Time and space changes; partial derivatives
- V. Sequence or Event: A fixed succession of lower-order elements
- VI. Relationship: A regularity in the simultaneous space-time behavior of two or more independent lower-order elements
- VII. Program: A network of choice points characterized by tests at the nodes
- VIII. Principles: Generalizations drawn from many different examples of lower-order perceptions; fact, heuristics, laws, beliefs
- IX. System Concepts: Organized entities; models; beings; world view

Perceptual Signal: The signal emitted by the input function of a system; an internal analogue of some aspect of the environment

Perception: A perceptual signal (inside a system) that is a continuous analogue of a state of affairs outside the system

Thesis: Our perceptions are the only reality we know, and the purpose of all our actions is to control the state of this perceived world.

^aAdapted from Powers (1973).

live and evolve in society. This in itself is understandable. As Dahlstrom tells us, we tend to "fix" knowledge of all that the human mind is capable of examining. Without doing so, there can be no "frame of reference" for thinking. The creation of a frame of reference is a kind of compromise; hence it is always bound to be unsatisfactory. Each frame of reference is thus "a station of tentativity; it is a

temporary halt to free ranging." We must continuously keep in mind that "the gain lies in the perspective developed at the halting place; the danger lies in a conviction that at long last we have reached our goal" (Dahlstrom 1973).

This raises the question of the short and long term. Figure 4.17 suggests a way out of the labyrinth of knowledge based on boxes, so as to enable us not only to assess its accuracy within the anticipatory framework but also to suggest appropriate implementation levels that could minimize negative or unfortunate aspects of the unanticipated (unintended) consequences (Christakis & Jessen 1974, p. 38). This chart offers us a way to keep using our boxes but to use them with flexibility. It also suggests a participatory rather than a **governmentally allocative** mode. Let it be noted that advocacy for such small-scale activity is gaining ground. The advocates range from E. F. Schumacher, who wrote the book of economic essays entitled *Small is Beautiful: Economics as if People Mattered* (Schumacher 1973), to Senator Mark O. Hatfield, who has introduced legislation entitled, "The Neighborhood Government Act" which is essentially enabling legislation to give people inclined to local responsibility and action the right to conduct their affairs (from welfare to security) in an autonomous fashion (U.S. Congress 1973).

QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Figure 4.17 shows that by mapping along the three principle dimensions of policy and impact assessment (axiology, praxiology, and phenomenology), the feasibility and impact of desired technological or planning alternatives can be assessed. It is important to note that what is sought is the appropriate level of implementation or imposition, levels ranging from the national to the neighborhood. The diagonal line is a two-way line, with input coming from each level of the society, being a dialectic between bottom-up and top-down in innovation and assessment.

As Nietzsche stated, man is "the not-yet-determined animal." We are not the helmsmen on a completed ship but the architects of continually changing ships, continually modified for new waters, much like the sail-boat's manipulation of sails for that purpose. This is what Ortega y Gasset has called our "ontological privilege."

We need such value dimensions in our work. The American Association for the Advancement of Science (AAAS) raised the issue in a different way at its 1974 meeting, when it formulated these questions

(AAAS 1974):

- How to live on a finite earth?
- How to live a good life on a finite earth?
- How to determine what a good life is? And on a finite earth?
- How to live a good life on a finite earth at peace and without destructive mismatches?
- How to provide the control (order) necessary to keep the stocks of wealth (nonrenewable resources) and the number of people constant with minimal sacrifice of individual freedom?

It is all a matter of definition and the continued efforts by all involved in the struggle to improve the predictive enterprise. As Abdul Rahman Pazhwak said when he retired as President of the UN General Assembly on April 19, 1967, predictive help is and always has been before us.

The (General) Assembly book of records is a chronicle of dire prophecies which time has—almost invariably and always unhappily—borne out. Few, if any, calamities in our time have befallen the world without some advance notice from the collective utterance from this rostrum. Thus, if fools and folly rule the world, the end of man in our time may come as a rude shock, but it will no longer come as a complete surprise. The warnings are given there.

This is stated to purposefully restate the obvious: the importance of "world view" and "reality perception." For those who believe that every-thing will work out okay, i.e., there is no problem in the ideological domain, I would like to point out a very basic, persistent world view gaining in popularity among blue collar workers and intellectuals: totalitarian acceptability.

Although Bucky Fuller asks the question "Utopia or oblivion?" (Fuller 1969) in a positive sense, Ophuls, on the other hand has a different world view and asks the question in an entirely different manner, posing an entirely different view of the prospects: "Leviathan or Oblivion?" (Ophuls 1973). The past developments in India's politics have, by some in India, been seen as "a threat to human rights everywhere," while some of India's religious leaders have stated that such has been "necessary to preserve freedom and democracy" (National Courier 1976).

Heilbroner has stated that we need a "diminution of scale, a reduction in the size of the human community from the dangerous level of immense nation states toward the 'polis' that defined the appropriate reach of political power for the ancient Greeks." But, although he advocates this, he then states that it is impossible, and therefore calls for "iron government" (Heilbroner 1974), what Ophuls means when he states that "only a Hobbesian sovereign can deal with this situation effectively" (Ophuls 1973) and which echoes Hardin's call for making public policy "mutual coercion mutually agreed upon" (Hardin 1973). The Christian Science Monitor ran a series in 1975 dealing with world problems, titling the first article, "A crowded world: Can mankind survive in freedom?" noting that the West has yet to prove that it can cope with long-term shortages of essentials in a fair way and "without regimentation" (Oka 1975). James Reston has discussed this debate going on in England, in a column entitled "Inflation, Democracy: Can They Co-Exist?" (Reston 1975). The Harvard political scientist Samuel Huntington admires the centralized control the Soviet Union uses in its governance, and now reasons that democracy is too expensive. Arnold Toynbee, the great historian, has perhaps put it in the most direct fashion when he wrote not long before his death that "in all developed

countries a new way of life—a severely regimented way—will have to be imposed by a ruthless authoritarian government" (Oka 1975).

Where those of us involved in TA, SIA, QOL, and social indicators stand on this debate will be reflected in how we formulate our questions, analyze our data, and frame our policy recommendations. Under such conditions, when scientists' efforts are also conducted under the cognitive (whether aware or unaware) influence of job and professional duties and advancement desires, it is not always possible to participate in the public policy development process with the social sciences so that any proposals made can be traced to something in human activity and interaction beyond the institution in which or for which one works, not to mention keeping in mind the possible unintended consequences. And, as Williams has noted in his study of social policy, "the social science research community as presently structured is quite unlikely to produce a consistent flow of studies of major relevance to social policy making for the disadvantaged" (Williams 1971). This is stated to remind us of the questions: Policy for whom? Who will be affected and how? Who will pay for it? Whose definition of quality of life will be the norm?

Friedrich has noted that "in reality ... it is the theory which decides what we can observe" (Friedrich 1972). Hempel has stated that, "as far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality" (Hempel 1956). Let us not forget the poignant and sad story Heisenberg tells about Einstein, for we too could become just as concretized in the box of our own inflexibilities as did Einstein. He exemplifies the difficulties of giving up an attitude on which one's entire scientific approach and career is based. Einstein "devoted his life to probing into that objective world of physical processes which runs its course in space and time, independent of us, according to firm laws." The symbols used enabled physicists to make statements about future behavior in the objective world. Yet, when the atomic scale was developed, asserting that "this objective world of time and space did not even exist and that the mathematical symbols of theoretical physics referred to possibilities rather than to facts," Einstein could not accept it. He refused to accept quantum physics as anything but "a temporary expedient" (Heisenberg 1971).

This paper has dealt with the reality of unintended consequences that occur as the result of any implementation of public policy. It has maintained that the application of the "elements of an ethics of assessment" can minimize negative results in the predictive enterprise of technological and social impact assessment. When we can do that, we will not be open to the accusation that we have dealt only in pigeonholes and have only "written the dictionary of a language that has no sentences."¹¹ In doing so, we will have learned "to speak as man," as Rene Dubos has admonished us to learn.¹²

¹¹ Homans, George C., *Social Behavior: Its Elementary Forms*, cited in Berelson and Steiner (1964), p. 2

¹² Dubos, Rene, *The Dream of Reason*, cited in Berelson and Steiner (1964), p. 2.

REFERENCES

Section 4.2 footnotes 7-12 are above. References in parentheses are as follows: [To be appended.]