

Organized Social Complexity
CHALLENGE TO POLITICS AND POLICY

Edited by Todd R. La Porte

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The essays in this collection were written within a common frame of reference: the assumption that recent human experience is characterized by heightened levels of surprise born of growing organized complexity in social relations. We are caught somehow in spreading webs of dependence. These networks become increasingly hard to understand. We act, supposing that the consequences of our actions will be acceptable. Yet our actions often prompt reactions unforeseen and unwanted. We seem to have unfamiliar connections to others, connections, the strength and locus of which change frequently. The duty of comprehension often burdens us uncomfortably, for what we had been taught is true does not help us to make sense of surprise nor assist us to create new alternatives which win much confidence. Each chapter of this book addresses some question about the validity of the conceptions we use as bases for social comprehension and for policy and politics. These questions arise as a consequence of increased organized social complexity. The webs of economic, political, and social life have become far more tightly woven than we ever thought they would. The roles, groups, organizations and institutions which enfold us have grown greatly in number, have become more sharply differentiated, and have grown more dependent on each other for mutual exchange.

This chapter is a kind of ending to our efforts; it is also a beginning. The remaining pages are devoted to drawing out more sharply some of the implications of what has gone before and to pointing toward what seems necessary for the future.

Constructs of Simplicity in the Face of Complexity

Cumulatively, the burden of the foregoing essays is that it is a shaky business to treat situations or institutions which are relatively complex as if they could be adequately handled by existing simple conceptions of

¹Embedded in this sentence and in the language of this chapter generally are close parallels to the distinctions Wilson has drawn out in the preceding chapter. However, I have found it congenial to my purposes here to use "situation" in a more generic sense than Wilson's *situational complexity*, though I mean much the same by it. That is, "situations" will denote here circumstances to be perceived by a role incumbent, as well as more generalized circumstances which the analyst would view. In the main,

social, political, and economic phenomena.¹ The question put was this: To what degree are the various constructs of reality we use as a basis for understanding and action capable of comprehending a social world characterized by increasing numbers of quite differentiated elements whose mutual dependencies are continually growing? The answers, as we have seen, are mixed. But the consensus weighs strongly on the side of pessimism, for only fragments of various conceptual approaches appear to be appropriate for understanding systems evincing high levels of organized social complexity. What does this "devaluation of the intellectual currency," as Ruggie has termed it, suggest for the fields of economics, political science, and sociology and for administrative theory, social theory, and social science methodology? It suggests to us that our initial impressions require further scrutiny; before attempting that, we now review those impressions.

Conceptual Challenge

In each case, underlying assumptions about social reality seem to have prompted theories which stress relatively large numbers of elements and relatively high levels of social differentiation. But notions which allow for internal interdependencies of elements *within* a social system are underdeveloped or quite often missing altogether. Are we lulled by our concepts mainly to expect large, quite differentiated social systems with low levels of internal interdependence? Such systems are, in fact, increasingly rare.

Economics is perhaps the clearest case of misplaced confidence. The well developed theories of economic behavior are founded upon the notion of the *market* in which buyers and sellers are considered to compete independently of other relations. A persistent examination of the phenomena most often analyzed by economists, behavior of national economies and of large corporations, reveals a much higher level of actual organized complexity than can be comprehended in the basic market metaphor. The application of conceptions based on this simplification to systems which are actually highly complex may very well be disastrous. While Chapter VII above does not explicitly deal with economic theory, the fundamental problem of the underidentified system to which the author points has not troubled economists as much as would seem warranted. For if simplicity is to be the crucial assumption upon which theories are based, what policy choices might issue from individuals whose personal basis for

the referent for organized complexity in this chapter is "large complex organization," or *institutional complexity* in Wilson's sense. Finally, his notion of *analytical complexity* is closely cognate to the discussion here on "conceptions" of phenomena. Our arguments are complementary: Present conceptions of social reality do not in general contain sufficient *analytical complexity* in the face of the actual complexity of situations (in my sense).

understanding *insists upon* such simplicity? Is it possible that policy makers who persist in assuming the existence of a simple market depend in effect upon public authority to coerce society into fitting the assumptions of their theory?²

In American political science one of the most fundamental assumptions about the actual political behavior of persons and groups is that they compete with each other for advantage in the allocation of scarce political and economic resources. "Pluralism" has become a rallying cry for many and the object of criticism for others.³ In this debate both advocate and critic alike seem tempted to emphasize the differentiation of groups. There is more relative attention to the multiplicity of groups than to the character of their interdependency. Thus the policy implications of interacting groups are viewed mainly in terms of controversy between them, and the issues of interdependence or reciprocity left largely undeveloped. While many authors sense the complex interdependence of contending groups, many conceptual discussions seem to deal with determining and evaluating the degree to which elite behavior is characteristic of the political system. Normative questions are often posed concerning whether pluralism should be the order of the day, or if such a description of political reality becomes an unwanted self-fulfilling prophecy. Other aspects of the debate revolve around disagreements about the degree to which policies should be adopted to increase the ability of groups to compete and to create advantages and/or handicaps in the competition. Much discussion in democratic theory centers on the proper conditions for equity in the competition and in the policies guiding redistribution of privilege which may or may not be required for a just balance between competitors. As in economics, there seems to be a temptation to devise policies which attempt to coerce social reality into fitting "official" conceptions of it.

The theoretical situation in political science is not so clear as in economics; but there is enough emphasis in political theory upon the plural nature of groups which plays down the interdependent character of those

²See Ruggie's discussion in Chapter IV for examples taken from English history.

³On the advocacy side of this issue, see Robert Dahl and Charles Lindbloom, *Politics, Economics, and Welfare: Planning and Politico-Economic Systems Resolved into Basic Social Processes* (New York: Harper Torchbooks, 1963) and Robert Dahl, *Who Governs? Democracy and Power in an American City* (New Haven: Yale University Press, 1961). For the opposing view, see Grant McConnell, *Private Power and American Democracy* (New York: Knopf, 1966) and Theodore Lowi, *The End of Liberalism* (New York: Norton, 1969). The debate is handily joined by Jack Walker, "A Critique of the Elitist Theory of Democracy," and Robert Dahl, "Further Reflections on the Elitist Theory," *American Political Science Review*, 60 (1966), 285-306. See also Andrew McFarland, *Power and Leadership in Pluralist Systems* (Palo Alto: Stanford University Press, 1969), esp. Chs. 2 and 3, for a discussion of authors using language similar to that developed here.

groups to warrant serious question. In a sense, the admonitions of A. F. Bentley and David Truman to note overlapping and complex relationships between groups have not stimulated the careful exploration of exchange relationships in a society which is increasingly based on social and economic interdependencies.⁴ To what degree do our behavioral premises lack a sufficiently clear basis for dealing with political and policy situations which become increasingly complex? Are we essentially burdened with political theories of systems far too simple to stand up against a check with reality? While some attempts have been made, in functional theory and in some types of systems theory applied to politics, to address aspects of this problem, these have come upon hard times in the discipline; and in theoretical terms they lack a reasonably well formulated way of taking interdependence into account.

In sociology much the same situation seems to prevail. The root concepts rest upon notions of social differentiation — division of labor, group interaction, etc.⁵ The structuralist tradition, to be sure, does include concerns for integration, i.e., the binding together of differentiated social groups into a cohesive whole; but most of its recent conceptual work seems to be at the small-group level, with little sustained emphasis upon the notions of systems exchange and interdependence.⁶ One notable exception is the work of Peter Blau emphasizing the relations of exchange and cooperative structure.⁷ A small but growing literature is emerging which seems to promise increased theoretical contribution to conceptualizing patterns of interdependence.

The configuration of present administrative and organizational theories follows the pattern of sociological thinking. Indeed, much of the most interesting material in this field issues from sociologists. But at bottom

⁴Arthur F. Bentley, *The Process of Government* (Cambridge: Harvard University Press, 1967) and David Truman, *The Governmental Process*, 2d ed. (New York: Knopf, 1971).

⁵See Herbert Spencer, *The Principles of Sociology*, 3d ed. (New York: D. Appleton, 1893-1899); Emil Durkheim, *The Division of Labor in Society*, trans. G. Simpson (Glencoe: Free Press, 1933); Talcott Parsons, *The Social System* (Glencoe: Free Press, 1951); and Neil Smelser, *Social Change in the Industrial Revolution* (Chicago: University of Chicago Press, 1965). See also S. N. Eisenstadt, "Social Change, Differentiation and Evolution," *American Sociological Review* 29 (1964), 375-385; and Martin Landau, "On the Uses of Functional Analysis in American Political Science," *Social Research*, 35 (1968), 48-75.

⁶See especially Joseph Berger, Bernard Cohen, J. Laurie Snell, and Morris Zelditch, Jr., *Types of Formalization in Small Group Research* (Boston: Houghton Mifflin, 1962).

⁷Peter Blau, *Exchange and Power in Social Life* (New York: Wiley, 1964) and "Exchange as a Conceptual Framework for the Study of Interorganizational Relationships," *Administrative Science Quarterly*, 5 (1961), 583-601.

st formulations rest heavily upon the underlying notions of the division of labor and specialization. Very little attention is devoted to problems of conceptualizing systems which are too complicated to take the form of hierarchies or "trees." A few theorists, notably James D. Thompson, R. Lawrence, and J. W. Lorsch, have begun to ask crucial questions related to integration and interdependence.⁸ Other work is being done which attempts to refine notions of exchange, especially between an organization and its environment.⁹ In a sense, these new areas of investigation arise from explicit recognition of growing external dependence among organizations, and they also promise a growing emphasis upon the problems of conceptualizing increasingly complex internal relationships. Finally, a word about the use of statistics and probability theories as a basis for social science methodology. It is a basic assumption that statistical analysis, parametric statistics particularly, requires that the data meet the assumptions of mutual exclusiveness.¹⁰ That is, information from one source should not be influential in determining the information derived from another source. Statistical methods have proved to be very powerful analytic tools in the study of many phenomena: voting behavior, economic behavior, individual behavior within groups, and of many other subjects, which any undergraduate social science major could mention. These methods provide a basis for the description of the behavior of elements in aggregated voters, economic choices, changes in attitudes, and patterns of characteristics of various populations. Statistical analysis is a prime tool in analysis of "unorganized complexity," as Weaver has termed that phenomenon.¹¹ But a fundamental question must be raised when it is used to describe the behavior of complex systems: To what degree is error incurred when the data from complex systems are treated statistically? The seriousness of the problem has been demonstrated above by Brewer and Maylay both, though neither attempts to move beyond diagnosis into description.

R. J. D. Thompson, *Organizations in Action* (New York: McGraw-Hill, 1967) and P. R. Lawrence and J. W. Lorsch, *Organization and Environment: Managing Differentiation and Integration* (Cambridge: Harvard University Press, 1967).

S. Terreberry, "The Evolution of Organizational Environment," *Administrative Science Quarterly*, 12 (1968), 540-613; W. Dill, "Environment as an Influence on Managerial Autonomy," *Administrative Science Quarterly*, 2 (1958), 409-443; M. Aiken and Hage, "Organizational Interdependence and Intraorganizational Structure," *American Sociological Review* 33 (1968), 912-930; and F. Emery and E. Trist, "The Social Texture of Organizational Environments," *Human Relations*, 18 (1965), 21-32.

⁸See, for example, William Feller, *Introduction to Probability and Statistics* (New York: Wiley, 1950) and Alexander M. Mood and Franklin A. Graybill, *Introduction to the Theory of Statistics* (New York: McGraw-Hill, 1963).

⁹Warren Weaver, "Science and Complexity," *American Scientist*, 36 (1948), 536-544.

Viewed impressionistically, the broad fields we have just cited seem predominantly based upon notions of social differentiation and give quite limited attention to social interdependence and social exchange. A close examination of the methods available to measure differentiation reveals only very limited tools with which to do so.¹² Almost no measures of interdependence are evident in the literature. This crucial variable has, to a degree, been the object of measurement attempts using graph theoretic language, although the emphasis there is mainly on connectedness, not exchange. Graph theory has not yet advanced to the point of being able to deal with networks of even moderate size. The mathematical base is unable to depict anything like the degree of complexity one can easily imagine.¹³

The theoretical problems posed for the social sciences by the possibility of actual significant increases in organized social complexity are intrinsically "interesting." Sporadic attempts have already been made to find ways of formalizing notions of complexity.¹⁴ These have provided the intellectual background of the essays presented here. But the appropriation of such social science concepts into the study and analysis of public policy calls for an approach not yet attempted.

From a Policy Perspective

Mixtures of concepts from the fields we have discussed are woven together by policy analysts, often unwittingly, to provide a basis for understanding a policy problem in the particular. That is, the more general conceptual perspectives of these disciplines have become the apparent bases for analyzing particular social conditions so that specific public policies may be developed and applied. Economic concepts have been used as bases for the "voucher system" in the funding of public education. Notions about the dynamics of groups form a basis for policies in the "War on Poverty." Other examples come to mind from recent attempts at reorganizing metropolitan and national public agencies. Thus, established versions of social scientific concepts have become the present basis for political programs and are probably subsumed into the commonsense understanding of attentive publics about their own social and political experiences. In this sense, the preconceptions about the social, economic, and political world held by the public and its teachers need to be taken

¹²One of the few sustained attempts to transcend their limitations is to be found in N. Gross, W. S. Mason, and A. W. McEachern, *Explorations in Role Analysis: Studies in the School Superintendency Role* (New York: Wiley, 1957).

¹³See Metlay's "Technical Note" and the two appendices to Chapter I, pp. 22-35 above.

¹⁴See Selected Bibliography appended to Chapter I.

quite seriously, for these notions often become the basis for action: to the degree our concepts err, we are subject to errors in policy and political action.

It appears from our analyses that the available corpus of social scientific knowledge provides neither expert nor layman with sufficient conceptual content for him to comprehend the increasingly complex situations actually confronting him. This void seems clearly evident in recent struggles to communicate a more precise understanding of the second and third-order consequences of technological development and the longer-term consequences of social planning.¹⁵ To the degree that social scientific concepts based mainly upon the assumption of simplicity are used as the basis for action in complex situations, surprise is an inevitable consequence, surprise very likely to be unwanted and unsettling. In a sense, we may expect continual surprise to prompt a kind of intellectual devaluation of social theories, a loss of public and elite confidence alike in the adequacy of the conceptions used both for understanding and for action. We must ask ourselves, therefore, whether we can afford to utilize constructs of simplicity in the face of increasing complexity.

The point here is not that we should refuse to simplify and abstract from our experiences. Clearly we must attempt to develop concepts which have the effect of simplifying inherently confusing individual experience. Rather, what seems necessary is to be much more self-conscious about the degree of error equally inherent in any set of simplifying notions about the social world. Thus, wariness in the use of conceptions assuming relative simplicity in social relations is always justified. We are obliged to be conscious of the possibility that at one time a particular type of simplification can be quite useful, while at another time that same simplification, once so useful, can become a dubious ally, causing us to miss important aspects of a new and changed situation. We are arguing that this seems to be the case with many of the central notions that undergird the social sciences.

But the social science and policy analysis communities have a terribly high stake in holding to our present conceptions of the social world. A very heavy investment in psychic and public resources has been made, and the use of such notions in the past apparently did not produce undue surprise.

¹⁵See R. V. Ayers, *Technological Forecasting and Long Range Planning* (New York: McGraw-Hill, 1961); Todd La Porte, "The Context of Technology Assessment: A Changing Perspective for Public Organization," *Public Administration Review*, 31 (1971); Harvey Brooks and Raymond Bowers, "The Assessment Technology," *Science*, 222 (1970); and R. Kasper, ed., *Technology Assessment: Understanding the Social Consequences of Technological Application* (New York: Praeger, 1972).

Indeed, these paradigms of social reality are associated with many successes, particularly in the economic realm. Thus, questioning the adequacy of traditional social concepts must be done with the clear recognition that they have been of considerable power in the past. To call for their rejection or substantial modification in the face of alleged increasing complexity is to ask a good deal of social scientists and policy analysts; it also makes a serious business of finding evidence that such an increase is occurring. Yet at the intuitive level there are many indications of such growth in the size, differentiation and interdependencies of the elements that make up social life. Could it be that we are indeed confronting a situation in which social reality, in its increasing complexity, is outstripping our attempts to comprehend it?

Let us suppose that the way we have attempted to cope with public problems has inadvertently led to increase in actual interdependencies — much as Taylor has traced out in Chapter III. This would mean that as we analyze situations in relatively simplistic terms and devise policy accordingly, we ourselves produce increasingly complex situations and widen the gap between them and our conceptual capacity to understand them. Our immediate response to public problems is to insist upon the coordination of relevant agencies, to devise new organizational problems, and to add additional levels of coordination among public and private bodies. We have no other way to think about organized action unless we throw in with those who believe that a market-like condition will correct the problem, that is, to disconnect the elements of the social world. But somehow neither inventing new "trees" of dependence nor returning to a market-like *laissez-faire* position seems sensible.

It seems apparent that a great many actions and policies intended to make a situation more manageable, that is to reduce both the complication and uncertainty of a particular problem area, in fact often works to increase the complexity of the institutions attempting to address the problem. In the face of this situation, there is little to turn to which gives insights into the dynamics of the growth of complexity. Little or no assistance in sorting out the likely consequences of increased complexity is available, nor is there much assistance in relating the types of normally considered administrative or legislative solutions to the problems of the increased organized complexity, which they are likely to stimulate.

Our analyses argue that in a number of areas increasing organized social complexity erodes the value of current social, economic and political theory. We have asserted that these are essentially theories of simple systems, applied now to a world in which simplicity is rapidly vanishing. How ought one to respond to this set of assertions and argu-

nts? Some might object that it is nonsense to consider the degree of interdependence presently evident in this country as so very high after all. I would like to assert that present social and economic theory is adequate. Others might argue that it is nonsense to think that our conceptions of the world are not accommodate any level of social complexity that might possibly confront us. Both responses imply that the problem is not grave enough to cause us to worry. Analysis goes on apace, policies are fashioned and implemented, and, in effect, our hypothesis is rejected. With what consequences? Early in introductory courses in statistics, students are introduced to the types of error: "Type I" occurs when a hypothesis is mistakenly rejected, that is, when the situation rejected as untrue turns out in fact to be true. A "Type II" error is to accept a false hypothesis, believing it to be true when in fact it is not. Insofar as the argument of this book is concerned, what are the consequences likely to be if either of these errors is committed? Let us say that we have assumed there to have been a far greater increase in organized complexity than is actually the case. Research is carried out by policy analysts begin to develop plans that include contingencies for increasing into account such magnified complexity. But then it is discovered that the world in fact is no more complex than it has ever been. The sense that social complexity is on the increase turns out to be only an intuitive feeling on the part of some of the young, the displaced, and a few harassed professionals: There is no real problem; for most people, neither understanding nor action presents any difficulties. Such being the case, the acceptance of our "false hypothesis" (a "Type II error") would entail all loss, perhaps only a momentary flutter of social scientists' analytic arts.

Let us say, on the other hand, that we have never suspected that the world was becoming overly complicated nor worried about difficulties arising from theoretical inadequacies in our available simplicity-assuming conceptions. Policies continue to be developed accordingly, based on assumptions of relatively unconnected social behavior. But what if it turns out that all the while our actions, paradoxically, have been contributing to the growth of systems having a greater number of individuals, groups, and organizations, components growing ever more mutually inclusive in their internal characteristics but increasingly dependent on each other for mutually required resources?

It is difficult to assess the consequences of a "Type I" error in this context, but it is certain that simplicity-assuming action is likely to do violence to complex social reality. Too much evidence can be found in the history of political revolutions and of environmental problems to expect anything else.

The Challenge to Research

When social exchanges turn out to be more numerous between more highly differentiated roles, groups, and organizations and when greater reciprocal interdependence is required to keep our social systems intact, what must we know more clearly? What are our special intellectual obligations when we are burdened with the weight of theories of simple systems persisting in a world of vanishing simplicity? Our most immediate task is to determine the degree to which the assumed condition of organized complexity actually prevails. This challenge imposes the dual task of conceptual and empirical work necessary for the refinements and/or the creation of concepts which can give language to our intuitive sense of connectedness, language necessary for developing testable indications of size, differentiation, and interdependence. There is a body of literature upon which to draw in such an enterprise, though at present it is overbalanced toward refinements of social differentiation at the expense of explicating the dynamics of interdependence. Thus, part of the effort would require a concerted attempt to construct usable notions of social exchange, social resources, and interdependence. Also required, if we are to rise above mere speculation, is the development of a *formal* mode of notation or expression capable of describing various patterns of exchange which involve bundles of incommensurable social, political, and economic resources.¹⁶ We encountered profound difficulties in our own attempt when we used the existing formal languages as a point of departure (see above, Chapter I, Appendix 1-B). Perhaps a new mathematics of complexity is required, though it is not at all clear what its configuration would be.

Another aspect of the conceptual challenge is the need for a greatly intensified self-consciousness about the underlying behavioral assumptions of our action-prompting theories of planning and policy analysis. This part of the task is principally a critical enterprise to uncover the inadequate behavioral bases of policy analysis as applied to particular areas of experience. Such an enterprise is probably necessary to instill the kind of humility which conceptual advance requires. Certainly those who use planning and systems analysis as a basis for policy development are well advised to engage in intensive conceptual scrutiny in order to avoid the generic traps pointed to by Ruggie and Starling.

We have already noted the methodological barrier which, also, must be breached: Although we may have adequate statistical tools for analyzing phenomena characterized by unorganized complexity, the application of

¹⁶One attempt may be seen in Warren Ilchman and Norman Uphoff, *The Political Economy of Change* (Berkeley: University of California Press, 1969); see esp. Ch. 3.

such tools to systems *within* which there are relatively high degrees of interdependence may very well be spurious. Even if methods can be devised for gathering data which indicate various levels of differentiation, interactions, and exchanges of resources within those systems, the available analytical tools may be wholly inadequate for providing us a basis upon which to manipulate the data in sensible ways. Present measures of interaction and available schemes of analysis and mapping, for example, generally assume that results should be *linear* or that deviations from the linear model will not occur frequently enough to make the investment in establishing measures of complexity and non-linearity worth while. At present we may be ill served by the inertias of parametric statistics and linear programming, neither of which is really equipped to handle data which does not meet the assumptions of unorganized complexity. Warren Weaver points to this problem specifically for the natural sciences; analogous to the dilemma in the social sciences just noted is physics' "many body problem": as the number of bodies increases, it soon becomes impossible to calculate their mutual influence on each other.¹⁷ But if we are to represent adequately the phenomenon we study, we must transcend the simple analogs of the physical sciences and develop a much more complex science of the social world. To date our methodologies have not served that purpose.

But general concepts and methodologies must be applied to some range of substantive questions. One approach to empirical work is demonstrated above in the analysis of "runaway complexity" in educational institutions. Nias suggests several crucial areas of research necessary for gaining a clear sense of the organizational implications of increased complexity, among them the patterns of interdependence and the boundary of a social system. One of the ways we can tell we are "inside" an organization is by encountering patterns of relatively intensive interaction. However, as interdependencies among organizations increase, the "boundaries" of such groups become blurred. Thus, an examination of the social and organizational boundary question which often puzzles organization theorists would be crucial to the development of a workable perspective on the social consequences of increased interdependence for group and subgroup dynamics. What, for example, can be said about the impact on the internal structure of groups made when the level of external dependencies begins to approach the level of internal dependencies?

The boundary question suggests another interesting structural problem: to what degree do different patterns of complex relationships alter the experience of system members? Newly devised ways of systematically

¹⁷Weaver, "Science and Complexity," p. 538.

ordering types of complex patterns, when linked to variations in internal and external behaviors, would increase our insight into the design of intra- and interorganizational structure. Do all "semilattice" arrangements have similar effects upon significant authority figures within the system? To what extent do "nearly full matrices" of dependence prompt decentralization? Other questions come to mind. Do particular patterns of complexity tend to exhibit regular patterns of internal redundancy? Can functional and dysfunctional patterns of redundant structural complexity systematically be related to the likelihood of adaptation to externally imposed change? As interdependence between a government organization, for example, and its public environment increases, can the point at which the organization comes to dominate its environment be foreseen? Do instances of anticipatory adaptation as well as passive adaptation to environmental change exist? What are they? Do particular patterns of internal interdependence tend to alter the likelihood of either passive or of anticipatory adaptation?

These questions and others the reader could raise suggest that the experience of individuals within systems of varying complexity is likely to vary along with it. Part of the difficulty with our increasing dependence on others and theirs on us is that at some point overload begins. What is it like to experience varied levels of organized social complexity? In a sense, the question calls for a phenomenology of complex systems. How is it to experience situations which edge beyond one's cognitive capacity to order the experience? To what degree do cause-effect beliefs lag behind experience so far that causal notions becomes nonsense? What can be said about the resulting psychic uncertainty? Is there a range of social and political reactions expected in situations which transcend cognitive limits?

Finally, a vital area of research implied by these essays is perhaps most relevant to the design of change itself. Part I singled out technology as a potent stimulus to increasing social complexity and traced aspects of the technology-organization-politics chain. Both the intended design of technology, particularly of large technical systems, and the design of large organizations are potential triggers to social change. In a sense they are two viable independent variables, aspects of the social world which *we* can purposively change. Thus, a proper and important focus of study is the degree to which altering of technological systems and large complex administrative agencies changes the experiences of their members and those outsiders who feel the consequences of these changes. It is likely that the way we now think to organize technology leads us straight away to increasingly complex social systems. But *must* technological "advance" invariably lead to greater complexity? Taylor has argued that it does not, but contrary impressions abound. Can technical design, under any

conditions, lead to the reduction of complexity, or is it always a complexifier? The more general question involves the development of much better knowledge about the effects of technical development upon the degree of perceived organized social complexity.

Knowledge of the probable consequences of organizational and technological configurations for social and political experience is absolutely necessary if choice regarding technology-related public policy is to advance beyond the intuitive. We are at present forced to evaluate and choose one policy or another which commits all levels of the body politic to technological and organizational changes about which we can know very little. But a good deal more can be known than our present vacuum of systematic knowledge would suggest. One suspects that a considerable amount of political debate is *not* based on great differences in social values, in "preference ordering." Rather, cloaked in political rhetoric, debate often concerns the most probable consequences to follow from ignoring this or that. Uncertainty about consequences becomes mixed with judgments about who should benefit and who should lose. This mixture of debate about "facts" with differences about values obscures understanding and muddles the decision process. It behooves scholars, particularly those in political science, public administration and public policy studies, sociology and economics to resist ready acceptance of such analysis. To the degree the arguments made here about the implications of organized social complexity are sensible, to that degree the standard conceptual bases for policy action are eroded. We are faced it seems with a kind ofuhnian impasse in which an increasing amount of evidence tells us that our basic conceptions of the social and political world no longer obtain. Our special obligation, then, is twofold: first, to heed the warnings about inevitable error which considerations of complexity point to and work to understand the validity of the warning; second, to develop a perspective of action which will allow us to act even in the face of apparently paralyzing uncertainty. This prescription shifts the emphasis from a reliance upon what is known and has been codified to a posture of readiness to deal with inevitable change. One of the most fundamental tasks of a technological society is to systematize and institutionalize those social expectations which encourage an openness to future change. We finish with a discussion of this major challenge.

Politics, Action, and Organizational Design

Men and women of affairs do not stop in mid-enterprise breathlessly waiting for scholars or social engineers to provide them better understanding so that their policies and programs will stumble less blindly. The

skins of increasing social interdependence require continuous exchange and flow of resources. Even if they proliferate beyond the researcher's capacity to understand them, people must act, always in the face of uncertainty. In the past, the effects of miscalculations spread less quickly. We sense that the amplitude of change was not so acute then. But whatever the past, we must act or people will starve. We act in the hope that they will not starve anyway. We are often disappointed. How, then, may our actions be modified to ensure less error in the face of more uncertainty. As organized social complexity increases, we must act when we cannot foresee consequences; we must plan when we cannot know; we must organize when we cannot control. In combination, these certainties change the context of politics, planning, and organizational design.

The discussion that follows is confronted with the problem central to these essays—the difficulty of prescribing positive actions when the underlying notions of social experience are eroded. Itself subject to all the uncertainties we have noted throughout, this discussion should be seen as tentative. But we speak in the declarative in order to avoid the irritating style of continual hedging and equivocation, albeit more in the spirit of hypothesis than conclusion.

The Politics of Uncertainty and Psychic Reassurance

Increasingly complex social organization poses a difficult situation for legislators, executives, and political leaders. It seems clear that there is a growing uneasiness in the public mind about the behavior of our governing institutions. We must still assume that through these institutions we have a great capacity to achieve what we seek; but mounting evidence of failure and unexpected social problems surrounds us. Thus, as relative control seems to decline and adequate foresight dims, the sense of social, economic, and personal uncertainty grows. Days no longer bring with them a bright sense of possibility.

We give the name "politics" to the process of dialogue and action carried on in pursuit of social privilege and personal advantage, equity and opportunity, social order and justice. Contemporary politics is the scrambling process of vying for the access to scarce social and economic resources. In the recent past, a great deal has been made of the notion that we joust over establishing certain orderings of political preference: what I want opposes what you want unless we want the same thing. Popular political rhetoric, often with echoes in political science writing, seems to suggest that if we could, collectively, just agree on what we want we would arrive at a happy state of consensus. Then, after achieving agreement about goals, we could get on with carrying out the means to those

collective ends. The implicit assumption is that we have sure confidence in our knowledge of means. But the *means* themselves have also become the objects of uncertainty. What, then, is the character of politics in the face of increasing personal and collective uncertainty about *both ends and means*?¹⁸ In such a situation we can expect agreement only that our national experience is far from our liking and beyond our understanding. When the disjuncture between experience and understanding widens, the sense of political and social ambiguity grows. As it reaches high level, thresholds of psychic pain and anxiety are approached arousing in many people vague but disquieting fears. At the same time, attempts are made to reduce incongruities and decrease the confusion between our values and beliefs and our experience. Translated into political modes of action, these attempts take on the character of the *politics of psychic reassurance*.

Attempts to bridge the gulf between experience and understanding can be made in at least two ways. We could attempt to change political and social reality "back" to fit our conceptions of it; that is, work to make the political institutions and popular values consonant with past values and with the cause-effect beliefs we have held about the world. Conversely, we could attempt to alter our values and/or our beliefs about the way things work so that they accord more with what appears to be going on "out there" in society. Advocates of either of these responses can try to achieve their aims through existing institutions or by attempting to establish new ones. Either way, political activity is characterized by arguments, persuasions, and proposed actions that promise to reduce uncertainty. Leaders on the right find a willing ear among the public when they urge upon us policies that "will make things more sensible," and advise us to act or concur in actions that will make the world "more like it ought to be," that is, as they remember it to have been.¹⁹ New leaders on the Left take the other tack. They propose programs which promise the confused that another ideology will allow a view of the world as it *really* is and thus will provide a better basis for action. Many of the young are now attempting to change their consciousness and actions to find a better fit

¹⁸For an extension of this discussion related to agreement on organizational means and ends and the resulting decision strategies, see James D. Thompson and Arthur Tuden, "Strategies, Structures and Processes of Organizational Decision" in *Comparative Studies in Administration*, ed. Thompson *et al.* (Pittsburgh: University of Pittsburgh Press, 1959) and J. D. Thompson, *Organizations in Action*, Ch. 8. For an extended example of managerial behavior in conditions of intense uncertainty, see Jay D. Starling, "The Miracle of City Government: Five Loaves and Two Fishes Equals One Fishwich," unpubl. dissertation, University of California, Berkeley (1973).

¹⁹See Garry Wills, *Nixon Agonistes: The Crisis of the Self-Made Man* (Boston: Houghton-Mifflin, 1970) for an example of this "conservative" mode of political behavior.

with their sense experience. But many people with a more crystallized perspective resist the costs of such wholesale mind-bending. They seek to turn political and social institutions toward a sensibility to personal experience. Figure 10-1 roughly partitions these various responses. Insofar as each perspective illustrated in Figure 10-1 is based essentially on simplicity assuming conceptions about the world, so each is subject to stumbling error and promises of reassurance. Nevertheless, the popular appeal of a Ronald Reagan or a George McGovern, a Guru Maharji or a Billy Graham bespeaks both the various styles of attempted reassurance and the intensity of the search for it.

Figure 10-1. Types of Response in the Politics of Psychic Reassurance

THE OBJECT OF CHANGE			
MODES OF RESPONSE		VALUES AND BELIEFS	SOCIAL EXPERIENCE
		POLITICAL	SOCIAL
	POLITICAL	Liberal Movements Radical Left	Conservative Movements Radical Right
	SOCIAL	Youth Culture Communes Mysticism	Traditional Social Groups Fundamentalist Religions

Policy Implementation as Error Making: Planning as Learning

As conceptions of the political world become more error prone, policy implementation becomes tantamount to error making. No matter what the policies or action guides established in the management of a large-scale organization, a government, or its economy, they are likely to be more productive of problems than they will be of solutions. Given the limitations on human foresight and the growing uncertainty about the adequacy of political and social values sought and the means to seek them, policy makers and planners must take a new perspective.

Much has been written about the policy process — its development and its analysis. A good deal of this work seems at bottom to be showing how certain types of procedures are destined either to succeed or fail in the formulating of a rational decision or policy depending on how close they come to effecting an orderly arrangement of information. These analyses, invariably computer based, seem to be founded mainly on the logic of information arrangement, as if clever structuring of information were

adequate for investing data with the *meaning* necessary for clear understanding. But the substantive notions of organizational dynamics, political development, or social change, in areas such as elementary education or social welfare, remain largely implicit. Some policy analysis, especially that using computer models, leaves one with the strong impression that its authors consider the assiduous application of information technology a sensible substitute for conceptual thought about the social world.²⁰ It seems to be generated by an unquestioning belief that moving ahead with this or that policy will turn out all right just as long as it is supported by quantities of data and many social indicators. It is difficult for us to share this faith. Other literature probes policy development and shows that behind it all lurks the scaly head of politics subverting the process and bestowing advantage to one group or another under the guise of the "rational thing to do."²¹

Likewise, much has been written about the proper ends of public policy.²² Everyone has his favorite policy position, assigning top priority to equity in the public service, or to the recovery of a healthy environment, or to peace with honor, economic growth, no growth, and so on. But whatever values become the touchstones of policy, we still must act it out, even as we remain unconvinced and uncertain about the methods of action available to us.

Policy and Planning in a New Mood

In the face of increasing uncertainty born of organized social complexity, planning and policy formulation set the stage quite as much for learning as for action. The underlying conceptions of social reality that informs policy analysts seem often to miss the interdependent character of the social or institutional situations thought to be the source of a particular problem. To the extent that they do, we can expect errors to follow, sometimes of remarkable proportion. Thus, surprises occur frequently in the process of implementing plans and policies, surprises from which a good

²⁰See Garry D. Brewer, *Politicians, Bureaucrats, and the Consultant* (New York: Basic Books, 1973) for a deeply probing critique, set within the context of organized complexity, of the use of computer models, and the men who sell them.

²¹In addition to numerous relevant citations made elsewhere throughout this book, especially in Chapter IV, see Alan Alshuler, *The City Planning Process: A Political Analysis* (Ithaca: Cornell University Press, 1965) and Aaron Wildavsky, *The Politics of the Budgetary Process* (Boston: Little, Brown, 1964).

²²See esp. Alan Alshuler, "The Goals of Comprehensive Planning," *Journal of the American Institute of Planners*, 31 (1965), 186-195; Melvin Webber, *Comprehensive Planning and Social Responsibility* (*Journal of the American Institute of Planners* 29 (1963); and C. West Churchman, *The Systems Approach* (New York: Delacorte, 1968).

deal could be learned, if only learning were considered as important as fixing blame. As the probability of policy induced error and failure increases, many of the expectations generally held for public policy lose their semblance of common sense. Public expectation for lasting solutions certainly should not be encouraged. Nor should particular confidence persist in sweeping comprehensive programs promising improvements in a single stroke. When errors are highly likely no matter what planners do to prevent them, the most valuable features of proposed plans and policies are those which work to reduce the relative costs of those errors. And if policy errors become occasions for posing questions, rather than for immediately assigning blame, invaluable learning will take place.

If unanticipated mistakes are going to persist, then actions which have *reversible* consequences should be encouraged over actions which have *irreversible* results. This reasoning suggests that the more irreversible the physical, economic, and social consequences of a particular public policy, the more hesitant we should be in making final commitments to it. Thus policy proposals or plans should be judged in terms of the relative costs of undoing as well as doing what is proposed.²³ A good deal of the intensity characterizing the environmentalists' objection to large, technically based programs, such as Mineral King, the Alaskan pipeline, and the development of oil shale sites, seems to be based on such a recognition. So too does the controversy about the effects of nuclear radiation upon plant and animal life. While the reversibility criterion is logically sensible, precision in determining degrees of potential irreversibility must await greatly improved conceptualizations and empirical work on the longer term consequences of large-scale programs. And we still are some distance away from having the theoretical or descriptive materials upon which to base reliable estimates.

In such a situation, another quality of policy takes on added importance. In some instances there is evidence that *multiple pathways* to a common policy outcome have been more or less systematically employed. The early day "Model Cities" planning is one such instance. Conceding that the "one best way" will always remain elusive, planners should develop several avenues for achieving the desired outcome. This strategy could be called *functional redundancy*, after the work of Landau cited in numerous places in the preceding chapters. Policies and plans that explicitly establish patterns of activities which include redundancy of function will be much less likely to precipitate harmful long-term consequences unknowingly.

²³See the discussion in National Academy of Science, *Technology: Processes of Assessment and Choice* (Washington, D.C.: Government Printing Office, 1969). See also Don K. Price, *The Scientific Estate* (Cambridge: Harvard University Press, 1965), pp. 144-156.

Multiple efforts in attacking the same problem area are much more likely to discover a wider range of benefits and to reduce the numbers of surprises than programs which are based on essentially preconceived single-minded solutions. This principle applies as much to economic programs as to social welfare; to technological programs as much as to governmental reorganization.

The criteria of both reversibility and redundancy can be used in evaluating policies which tend either toward the incremental or comprehensive types discussed by Ruggie in Chapter IV. While it is probable that incremental policies are more often "reversible" than comprehensive ones, this characteristic probably varies considerably within both types. There is no reason to suppose that incremental efforts are in principle more reversible than comprehensive ones. Nor is there reason to suppose that, given advances in concept and in research techniques, there could not be considerable reversibility designed into aspects of synoptic policies. On the other hand, greater systematic attention to functional redundancy in comprehensive policy development is more likely to prove effective than are piecemeal attempts at incremental improvement. But, in this regard, there is no intrinsic reason for these two types of policy perspectives to differ in principle. Various combinations of the three variables are presented in figure 10-2 with some illustrations of policy programs which seem to be described by the various cells. We leave it to the reader to supply other examples and/or to refine the implications of this way of perceiving policy formulation.

Figure 10-2. Types of Policy Perspectives and Criteria in a New Mood

EFFECT OF POLICY	POLICY MAKING STRATEGY			
	INCREMENTAL		COMPREHENSIVE	
	REVERSIBLE	IRREVERSIBLE	REVERSIBLE	IRREVERSIBLE
FUNCTIONAL	Tax Policies	Energy Resource Depletion	Community Mental Health Planning Environmental Protection	New Town Development Large Scale Urban Renewal
	Interest Rate Adjustments	Public Works Investments		Metropolitan Mass Transit and Land-Use Planning
DYSFUNCTIONAL OR ABSENT				

Complexity and Uncertainty

Finally, to the degree that policy formulation and implementation are carried out in the face of increasing uncertainty, a substantial change within policy formulation and action groups is necessary. In the past, we believed that we could know enough about social, economic, and political dynamics to "go for" the one best single policy. In effect this meant that it was sensible to expect a policy analyst to find the best way. If many mistakes were made in the process of implementing a policy, or if the policy itself turned out to be a disaster, then clearly the analyst's duplicity or incompetence should be held responsible. Policy failure need not have occurred. It did so only because some individual or some group was corrupted or lacked the competence they should have had. But in a policy world where our conception of the social and economic is much too simplistic, the making of errors is due not only to particular incompetencies or loss of nerve or ethics; rather, error-making is endemic to any policy forming or advising role.

In a growing number of areas, the quality of conceptions does not lend much predictive confidence to policy formulation. Self-interest or ineptitude on part of the analyst is rarely to blame; on the contrary, the best of them are bound to err. Thus, in organizational situations where the major mode of dealing with errors is punitive, most of those responsible for making errors attempt to avoid detection. Hence there is very little shared learning about the situation which produced the error or about what might be done to avoid it in the future.²⁴ To camouflage error in the face of increasing uncertainty is often a successful way of dodging blame. It is almost always a missed opportunity to learn. What attributes define a policy group for which inevitable error becomes an occasion for collective learning? What are the conditions associated with a group in which the reporting on one's personal errors is rewarded and valued by other members?

Probably the most important characteristic of such a group is its general recognition that errors are inevitable and that delay in reporting or acknowledging them will prove very costly to the collective operation. Such a recognition is slow in coming as an official organizational norm, for it implies modes of interpersonal relationships which run counter to most of what is informally learned in organization life.²⁵ It means that groups

²⁴For a discussion of the difficulties of hierarchy in this situation, see Lawrence Spence, "Social Epistemology: An Essay in the Politics of Knowledge," unpubl. dissertation, University of California Berkeley (1973). See also Harold Wilenski, *Organizational Intelligence: Knowledge and Policy and Government and Industry* (New York: Basic Books, 1967).

²⁵For a discussion of the psychological climate surrounding executives, see Chris Argyris, *Integrating the Individual and the Organization* (New York: Wiley, 1967), Ch. 5.

understand that they must become error exploring rather than error camouflaging, error embracing rather than error punishing.²⁶ Interpersonal relationships within organizations are seldom characterized by that relative trust and openness required to induce members to reveal that they have made a mistake or have been responsible for a miscalculation. Rather, the predominant mode is "punishment centered"; to acknowledge mistakes is to open oneself to informal ridicule or formal punishment.²⁷ Generally, only in those organizations based on quite sophisticated technologies, such as some R & D groups, is there sufficiently recognized interdependence to make the acknowledgment of errors and debriefing on them valued activities.

As a complement to error embracing, sustained internal self criticism is required to discover in advance of policy implementation as many potential surprises as possible. In a sense, this practice is part and parcel of the scientific method as applied to policy work and is already incorporated into many policy groups. Again, the support of such a climate of inter-action requires that conceptual gaps or blind spots be acknowledged by the persons who have them. The corollaries to this requirement are that personal conceptual growth should be sought and then rewarded by others in the group and that a corporate spirit of experimentation is necessary in order for individual members to endure the anxieties often associated with revealing personal limitations. But in an organizational and policy world in which the expectation of adequate knowledge is less and less sensible, what sense remains in punishing the conceptual limitations which afflict us all? What ought to be subject to blame or praise is the individual member's propensity to learn from error and to engage in those reciprocal exchanges which enhance participants' capacities mutually to reduce uncertainty.

Organization in Response to Complexity

The making of plans signals action, but without cooperative effort plans remain paper hopes. Complex organizations have in a modern technological age become the crucial requirement for action. Yet as organized social complexity increases so does our uncertainty about how to sustain effective cooperative effort. Surprises issue from group action as well as from personal action. Our confidence in centralized authority declines. Weber's assertion that bureaucratic forms are the most efficient rings hollow in

²⁶See esp. Donald Michael, *On the Social Psychology of Learning to Plan — And Planning to Learn* (San Francisco: Jossey-Bass, 1974).

²⁷See Alvin Gouldner, *Patterns of Industrial Bureaucracy* (Glencoe, Ill.: Free Press, 1954).

our ears, and reliable alternatives to the once trusted hierarchic structure of large organizations are clearly being sought.

Executive expectations of a fixed and effective organizational structure are the grounding for bureaucratic forms. These expectations assume that the substantive requirements of problem solving in one or another area will remain relatively stable and can be known. Such expectations also assume that directions and goals can be known and that new opportunities and pitfalls are foreseeable. Thus a particular organizational structure is, in essence, a hypothesis about the technical and coordinative requirements of the future. But the burden of our entire argument is that neither problems nor task requirements can be known in advance with very much confidence. The skeins of interdependences matched against the limited conceptions we employ give us little basis for confidently moving into the future. Most situations far outstrip our capacities to identify crucial factors and control them. We cannot expect stability of an organization's environment nor depend upon hierarchical authority structure for effective control. What then are sensible organizational responses? For we must continue to cooperate and act. One of the responses most likely to occur is the devolution and modification of authority structures.

In cases of relatively simple organized complexity, executives can meet the requisites of centralized authority dispensed through "tree-like" hierarchies of command and communication. It has been possible to construct chain-of-command and technical arrangements more or less adequate for the task and character of the environment of certain "simple" organizations. In effect, someone in a position of centralized authority could usually tell when a subordinate made a significant error and probably knew enough himself to direct corrective measures with some confidence. As it becomes more difficult to specify how to avoid errors, dependence upon technically skilled subordinates must increase. When it also becomes difficult to discover errors, the fundamental conditions which underlie all firmly centralized hierarchical organizational arrangements collapse. Hierarchy runs amok; tasks are not coordinated well, problems are not anticipated correctly, and the necessary nodes of information exchanged are not developed.²⁸

At least two modifications are in order as hierarchy becomes problematic: One, the *professionalization* of organizations, is obvious to most managers and embraced by them everywhere; the other, organizational

²⁸See esp. Wilenski, *Organizational Intelligence*, Victor Thompson, *Modern Organizations* (New York: Knopf, 1961); James D. Thompson, *Organizations in Action*, and Theodore Caplow, *Principles of Organization* (New York: Harcourt, Brace, 1964).

decentralization, is occurring but is generally resisted by managers.²⁹ Both professionalization and decentralization lead to a dramatic increase in the "semilattice-like" structure of complex organizations. Together, these two changes suggest that we need to alter significantly our expectations for authority styles and our notions of efficient operations and organizational design.

As management's knowledge limitations become more obvious, "professionals" are recruited in increasing numbers, clearly in an effort to reduce the uncertainties felt by executives.³⁰ Competition between and among public and private organizations then becomes as much a technical rivalry as it is a market or political one. Such technical rivalry means that the dominance of managers over technical subordinates declines in proportion to the needs managers feel for specialized information and knowledge. After a point, it seems clear that professional specialists, while resolving technically rooted uncertainty, become themselves a new source of organizational uncertainty. By and large, executives have seized on the benefits of specialists' knowledge, but at the expense of their own autonomy. At the extreme, the top executive becomes very dependent upon the expertise of his own subordinates. Certainly as professionalization pervades more levels of an organization, we would expect significant changes in authority style. The highly directive authoritarian mode has all but disappeared from complex organizations. It is being replaced by a much more consultative one, in some R & D organizations approaching collegiality. When consultation is limited and the situation complex, we could expect great and often unpleasant surprise. The troubles of Nixon's White House seem an apt case in point.

With increasing numbers of professionals necessary for technical effectiveness, extreme centralization is increasingly difficult to maintain. Presures for decentralization often follow quickly when tasks are delegated to technical groups. Almost always it is argued that those close to the "real work" of the organization know better both what the problems are and the most probable solutions. But as this inevitable decentralization

²⁹For an expanded discussion of this reaction, see Todd R. La Porte, "Organizational Responses to Complexity: Research and Development as Organized Inquiry and Action," Part I. Working Paper no. 141 (January, 1971) Center for Planning and Development Research, Institute of Urban and Regional Development, University of California, Berkeley, Ch. 1.

³⁰See, for example, K. S. Lynn, ed., *The Professions in America* (Boston: Houghton-Mifflin, 1965); Mark Abrahamson, ed., *The Professional in the Organization* (Chicago: Rand McNally, 1967); Corinne Gilb, *Hidden Hierarchies: The Professions and Government* (New York: Harper & Row, 1966); and W. Kornhauser, *Scientists in Industry: Conflict and Accommodation* (Berkeley: University of California Press, 1962).

takes place, it does so often at the expense of coordination of various specialties. In effect, it increases differentiation without the necessary increase in perceived interdependence.³¹ The issue of technical knowledge versus organizational control is joined, in part, due to deeply held notions of efficiency. Often it is believed that parallel or overlapping activities, i.e., redundancy, are wasteful. It is also tacitly felt that investment in communicating to others about what is going on in a group is at best a necessary inconvenience and possibly dangerous to professional autonomy. Thus, efforts to cut down overlap and generally to avoid "overinforming" others (through paper work) about activities within a group are believed to be undertaken for the sake of "efficiency." And indeed they are when ultimate goals are clear, the problem well defined, and the solution well established. They are not when simplicity escapes us and neither goals nor means nor consequences are very clear.

These observable trends offer an important lesson for organizational designers. Instead of grudgingly accepting professionalization and decentralization and resisting efforts to achieve close coordination, people in organizations confronted with high levels of organized complexity must develop new patterns of delegation and redundancy. Searching out apt sites for functional redundancy and for situations in which decentralization would benefit everyone in the organization is crucial for maintaining the technical and social capacities provided by cooperation in changing complex environments. It is possible to alter authority and communication patterns so that everyone involved feels an increased control over those things that affect their work.³² A much more positive and sustained search for organizational arrangements and guidelines that increase both *actual* and *perceived* interdependence is crucial for the future. Were this to occur, relationships within institutions or organizations as well as those among them would begin to take on the qualities of "normative complexity" discussed by Wilson in Chapter IX.³³ Technical and executive arrangements that lead from a clear recognition that individual members need each other for mutual exchange and benefit must accompany such a development, for in effect it means that trust among members becomes recognized as functional and necessary and that the winning of relative short-term advantage may result in longer-term hurt.

³¹See the necessary distinction made in Chapter I of *perceived* interdependence, p. 6.

³²Arnold Tannenbaum, ed., *Control in Organizations* (New York: McGraw-Hill, 1968).

³³A comparison of *normative complexity* to *coercive complexity* is drawn in the preceding chapter, along with a discussion of some of the implications associated with perceiving complexity relations in one frame or the other. See pp. 284ff.

But entering a period of mutually recognized interdependence can occur only if there are very significant shifts in the tone and character of social exchange within and between organizations. At present mutual dependence is not rewarded; often it becomes a liability to those attempting it. What is rewarded are separate, quite plural, competitive activities within organizations — the very behavior which reduces the likelihood of mutually recognized interdependence.

It seems quite clear that the opportunities as well as the challenges of increasing organized social complexity will stimulate the development of new organizational and political forms. Optimistically, this could be an adventure in discovery and enrichment. It is also possible that our response to uncertainty could result in terrible social violence if we simplify unwisely. In any event meeting both challenge and opportunity will result in unfamiliar patterns of cooperative complex public and private organizations as they try to cope with a more complex future. To cope successfully will require at minimum those policies and new sensibilities which foster an organizational and social ambience of openness to new possibilities. Recruitment and advancement policies and programs of evaluating groups and individuals have to be reviewed and changed, so that any liabilities attached to social interdependence can be avoided. Formal incentives designed to elicit group attitudes that will encourage mutual exchange and trust among members should be instituted. On balance, it is most likely that advances toward the opportunities of social complexity will be made by those people who combine highly competent technical skills with keen sensitivity in interpersonal and group relationships. Our mutual challenge is to live in such a way that the ambience of openness to new possibilities which is crucial for the risky and demanding business before us may be realized.

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