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THE ROLES OF INTELLIGENCE SYSTEMS IN URBAN-SYSTEMS PLANNING

Melvin M. Webber

Our new understandings of urban systems and our changing concepts of urban problems have not yet been matched by satisfactory urban planning processes. In response to the growing demand for good information that might support rational developmental decisions, "intelligence centers" are proposed, operating with an interim programming strategy. These centers would serve the multiplicity of groups in the urban areas, supplying improved inventories and forecasts; and they would serve governmental investors by designing targets, programs, and strategies for public action. They would inevitably be engaged in politics and action, but they would bring the scientific morality into urban affairs—a new ingredient in the urban political scene. They are proposed as the effective city planning agencies for this era of flux.

Among the more significant developments in the urban-policy sciences are the changes being wrought in our images of cities, urban problems, and ourselves. Rather paradoxically, in place of the conceptual order that once composed the urban system into discrete and separable parts, the clarifying images are revealing blurred boundaries demarking ambiguous subsystems. In turn, these are seen enmeshed in such complex interplay as to deny us our previous conceptions of order and causation and our traditional perceptions of our roles. These new thoughtways may fundamentally reshape the character of research, planning, policy-making, and action in urban affairs.

I should like briefly to touch upon some of these revised images, and then to examine some of their implications for planning and for the intelligence systems that might support improved planning.

I New Images of Urban Systems

FROM STOCKS TO FLOWS

Reflecting the early literature of urban geography and human ecology, city planning has traditionally perceived the city as a discrete physical entity whose signal traits are size, shape, and density. This perception has encouraged much the same sorts of morphological measurements and classifications that typified early biology. It's only in recent years that serious attention has been directed to the interaction among city dwellers. The new studies are now leading us to a different conception of the city and of the policy issues associated with urbanization.

Recent investigations are converging to reveal an urban-system complexity we had not previously suspected. These include, most notably, the input-output studies, the tracings of interregional income and commodity flows, the studies of the interactional consequences of relatively falling transportation and communication costs, the investigations of social mobility and of changing social organization and social behavior. Alongside the neatly compartmentalized arrangements of urban settlements, such as show up in central-place maps, these findings are begin-

ning to uncover networks of interdependent but functionally specialized social and economic communities. Each such community (whether an industry, professional group, or religious order) is composed of different sorts of people who are distributed among distant settlements and who play various roles in a great many different sorts of interest-based communities. The pattern seems to be very disparate, ambiguous, and indeterminate. Unfortunately, it is still very poorly understood. Despite all the recent work in urbanism, we still do not have even an inadequate description of the urban system's structure.

In search of some organizing principles that might give coherence to these new findings and conceptions, students of urbanism are turning their attention from considerations of form to considerations of process. That is, in an effort to find out what the urban system *is*, we are beginning to ask how it *works*. Increasingly, our preoccupation with *stocks* of people, goods, buildings, and wealth is being supplemented by a growing attention to the *flows* of money, goods, services, information, and satisfactions among the individuals and groups who inhabit cities; for it is these flows that shape opportunity and welfare.

As one result, it is less common to deal with human settlements as members of a hierarchical set of territorially defined cities and metropolitan areas—as discrete and essentially closed mechanical systems of buildings, utility lines, and roads. Instead we are finding it helpful to view settlements as but aspects of societal systems. Thus, social organization and human interaction are replacing density and place as the foci of inquiry and of political strategy. Increasingly, we are coming to see that the many *legally* discrete governments, governmental departments, and private organizations are in fact *functionally* interlocking and interdependent. And so, we are finding it useful to view local government and federal government as but aspects of each other and as continuous with the larger spectrum of authority centers.¹ In turn, we are led to search for budgetary and programmatic approaches that would integrate the activities of complementary public governments and to look for the overlaps and interdependencies among the various public and private governments that collaborate in urban development.

Our new perspective is helping to distinguish the urban subsystems by their economic and social functions—by the roles they play and the purposes they serve—rather than to define them merely by their locations or by their

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administrative organization. Each subsystem is being seen as open to the flows of information, money, and goods from other subsystems it depends upon. The stability, growth, and efficiency of each is being understood to depend upon the complex self-organizing and self-regulating processes through which flows between subsystems are modulated and adaptation to environmental change is accomplished.

Those who would plan for such open, self-regulating systems must confront their tasks with quite different strategies than are appropriate to the design of mechanical systems. Concomitantly, the informational demands are also quite different. And so, I shall return to a closer examination of these implications for planning.

THE MERGING ACTORS

At the same time that increased understanding of urban processes is depreciating product-perceptions of cityness and is blurring the boundaries among settlements, those boundaries that once distinguished the separate species of urbanists are becoming even more blurred. This is most clearly evident in the growing collaboration among the various breeds of social and behavioral scientists, the variously professionalized practitioners, and the more varied executives and politicians in and out of government. The traditional professional societies, long the dominant locus of rights and obligations, are finding themselves in active competition with a new crop of associations and ad hoc groups. These new groups are arising out of shared interests in social and intellectual problems, rather than out of occupational or disciplinary heritages. Their members typically admit no fealties to either economics, law, sociology, medicine, geography, political science, city planning, or any of the other institutionalized professions exclusively. The long-sought but elusive unification of the social sciences and of the practice-professions seems now to be just happening, and without the self-consciousness that marked most early searches for commonality.

A great many influences have contributed to this gradual erosion of professional boundaries, but two stand out. The first is that the accumulating refinements in theory, within each of the traditional disciplines/professions, have demanded the admission of ever larger ranges of variables, and these have made for acceptance of once-alien concepts that had been the exclusive properties of other professions. Simultaneously, the rapid improvements in analytic methods, coupled with the new computational capabilities, are making it possible to deal with large masses of data pertaining to large numbers of variables.

The second is the growing sense of discovery among researchers that their theory really *is* useful in dealing with contemporary social problems. In turn, this is reinforcing the growing attraction to *problem-focused* research which supports action while further building theory. In addition, the demonstrations of the social scientist's usefulness is persuading practitioners and politicians that effective action really *does* depend upon systematic analysis and upon the capacity sensitively to predict the consequences of actions. These men are now becoming major customers for the rigorous theory and method that used to interest only the academes.

As one result, the so-called "academic" types find them-

selves shuttling back and forth, with increasing frequency, between classroom and White House, state house, city hall, and corporation executive suite. Once admitted to these high councils, it is unavoidable that they identify to new sets of peers for whom the test of excellence is the ability to effect change in the real world out there.

In parallel manner, the "operator" types are being acculturated into academic society. It is already quite difficult to classify many a civil servant as either social scientist, practitioner, or policy-maker. He simultaneously plays all those roles, having been bred into a hybrid species of sophisticated and sometimes effective "problem solver."

One effect of these changes I've already alluded to. It has been to bring about a multiplicity of *industrial-union*-type groups, as Leonard Duhl has put it—groups composed of diverse researchers-practitioners whose interests and skills equip them to deal with specific problem situations, and who jointly undertake a common task. Operationally, although not yet formally, these heterogeneous groups are fast replacing the *craft-union*-type groupings that have been associated with the traditional academic disciplines and with the traditional practice professions.

Another effect of these changes has been to erode the dualisms and other simplistic constructs that have for so long reinforced the boundaries between groups and served to hide the complexities of the problems they've dealt with. The dualism that would polarize "academics" and "practitioners" has been paralleled by a vast array of equally devilish ones: science and art, fact and value, action and theory, public and private, individual and society, good and evil, urban and rural, politics and planning, capital budgets and operating budgets, auto and transit, and many more.

Polar distinctions of these sorts are very handy, if one wants to incite others to action or to defend a faith. But dualisms get very blurry under the fine lenses of inquiry. Indeed, the history of modern science records the destruction of one dualism after another.

In the most dramatic blows—the ones that knocked out the dualisms that had once appeared to be most indestructible—Freud's discovery of the unconscious merged body and soul as but aspects of the same phenomenon; Einstein showed that energy and matter are transformable into each other; Darwin laid the man-versus-animal dualism to rest for all time; and Dewey exposed the essential sameness of ends and means. Although these are surely the most significant scientific events of our age, they are not unique. One by one a vast array of black-white, yes-no, push-pull, either-or dichotomies have been falling, forcing us to look along the continuums, rather than to focus on the extremes.

Now, I should make it clear that nothing I've been saying about the blurring boundaries of urban systems and urban actors is intended to mean that they are becoming homogeneous. I mean just the opposite. Whatever the settlement pattern might be, locations will always be highly differentiated, and individual locators will continue to search out those spots that seem to suit their special purposes best. Social and economic communities are becoming increasingly diverse, as people recommit themselves in exploiting newly opened opportunities to efforts to alleviate poverty, that are now being made by representatives from the health, social welfare, urban renewal, education, and the many other agencies of muni-

central government, are leading to new program designs that cut across traditional agency boundaries. They are making for new alignments among pieces of agencies. Rather than homogenization, the changes are toward ever-increasing diversity.

The new togetherness among the many players in the urban-policy game is by no means a sign of homogenization, either. Although many people from diverse origins are converging around specific urban problems, they are not about to lose their identities in a faceless professional mass. Quite the contrary. Each brings a somewhat different bundle of perceptions, methods, values, loyalties, and interests. Each therefore plays the game according to somewhat different rules. And, equally important, each plays an assortment of roles, such that the scientist is also politician who advocates preferred analytic methods, evidence, and conclusions; and the lobbyist is also scientist who searches for most-workable strategies and actions.

This growing pluralism among the pros is being paralleled by increasing diversity in the population at large and by ever-more complex relations among the many governments, agencies, and firms that take actions affecting those populations. That is to say, at the same time that the contributors to public decisions are becoming more varied, the publics themselves are becoming more diversified, the numbers of decision centers are increasing, the networks of influence among publics and decision-centers are becoming more intricately woven; and, hence, the decision rules are getting more complicated. In this context of ever-increasing ambiguity and pluralism among open, self-organizing and self-regulating systems, then, what sort of planning strategy is most likely to work? What is the effective place for the information sciences? And what roles can the information producers profitably play?

II Strategies for Planning

There is a lively search for new urban-planning methods nowadays, for the plain fact is that we have not yet devised a workable planning method that conforms to our new conceptions of system structure and behavior, or to our new understanding of how decisions get made. We find ourselves dissatisfied with traditional methods, perplexed by some built-in paradoxes that our new images and findings erect, and groping for ways to improve our effectiveness in the face of these puzzles.

PRESENT GOAL-SETTING METHODS

The available and presently institutionalized methods derive from experience with systems having characteristics different from those I've been describing. They were refined in the more unitary settings of the private corporation, the engineering firm, and the single-function governmental agency; and they have proved most useful in designing and constructing machines, buildings, and similar physical objects. Because of their success with very complicated weapon and missile systems and with production processes, some systems analysts and operations researchers are now seeking to apply their sophisticated methods in municipal government. They are finding, however, that their planning strategies are not easily transferred, since they call for a measure of goal consensus, for a quality of prediction, a hierarchy of command, and a degree of control that do not exist in the normal context of public affairs.

It is true that the large corporation or the military establishment holds multiple goals, that it harbors many competing groups having conflicting interests, and that in microcosm it thus resembles the larger political arena. But the goals of the corporation or the Pentagon are nonetheless fairly clear. They are certainly simpler than those pursued by the many groups operating in a metropolitan area. Their authority systems, however diffuse, are considerably more centralized than those of the larger urban society. The establishment is thus able to direct its actions toward desired future states much more purposefully.

On the basis of completed research-and-development work and operations-research preparation, a new product can be designed for production, the tools can be cut, the production lines laid out, a work force hired and trained, and a marketing system erected—all with considerable coordination and centralized managerial control. However, because this sort of coordinated effort is seldom possible in urban affairs, the managerial and analytic techniques that have proved effective in industrial or military applications must be considerably modified before they can be adapted to the more complex urban setting.

Similarly simplistic planning methods have long been institutionalized in urban governments, however, having been introduced by professional groups skilled in designing the physical components of cities. Like those that find favor in the industrial firm, these methods call for a degree of centralized control that is more commonly associated with authoritarian organizations and/or for a concordance of values that is most typical of voluntary groups. This planning procedure revolves around sets of standards for the sizes, locations, capacities, and other physical dimensions of highways, school houses, water systems, library buildings, and the like. In turn, it relies upon long-range forecasts of demand (sometimes called "requirements"), and upon professionals' judgments of desired future conditions. It results in the declaration of a design (or "plan") for facilities that conforms to those standards and judgments and matches the expected loadings. Although the key decisions are imbedded in the standards and the professional predilections, only rarely are their origins or rationales made explicit. They are typically imbedded in the ideological heritage of the individual professional groups that market them.

To the degree that legislators accept these standards, forecasts, preferences, and designs as reflecting their own objectives and outlooks, and to the degree that their political and fiscal powers permit them to act autonomously, they can indeed approximate the behavior of well-staffed corporation executives. The accomplishments in paving city streets, disposing of sewage, and building school houses suggest that, however crude, such plans for physical structures are highly useful. Because of the long lead-times required and the obvious importance of mechanically fitting physical parts together, such long-term designs may even be necessary.²

But they yield no assurances that the investment pay-offs would best serve the objectives being sought, that the allocations of benefits and costs are most equitable, or that the timing of construction is optimal to the intended goal. Moreover, it is highly doubtful that this planning approach facilitates adaptation to rapidly changing external

conditions, that it is also suited to planning community service programs, or that it is relevant to the millions of market-oriented decisions and actions that are taken by agencies outside the direct authority system of the municipal corporation.

American city councils make only a small proportion of the decisions that affect the course of urban development. Of these, a smaller fraction still are made autonomously, expressing the willful choices of resolute councilmen. Even in such seemingly straightforward decisions as those affecting freeway location, park and playground design, or the installation of sewage-treatment plants, the numbers of contending actors are likely to be huge. State and federal agents have strong strings attached to funds, and they exert powerful influence on members of their own professional societies who work for local government. No matter whom they work for, the members of a professional group are likely to share beliefs on "appropriate standards" and "necessary requirements." This gives them considerable power, since laymen tend to be awed by their superior technical knowledge and by the shared conclusions presented by the professionals in federal, state, and local governments. A vast array of interest groups will direct whatever power they may have to influence the judgments of politically conscious legislators. Thus even here, where the city legislator acts most autonomously and could presumably act with most deliberate rationality, the decision processes conspire against him.

Even ignoring the unsolved problems of forecasting future demand and predicting future goals of future populations, we are thus left with many doubts about the utility of long-term designs of this sort. For example, land-use plans in American cities are not designs for action, unlike those in centrally controlled New Towns and unlike construction plans for buildings, bridges, and machines.³ They express the authors' opinion of a desirable future state, but offer few guides for getting there, and fewer clues about the possibilities of ever getting there. In the absence of authoritarian controls, their most important function is hortatory in character.

More important still, many of the crucial decisions affecting urban development are not influenced by even this sort of hortatory portrait of a desired future state. Surely the most important conditioner of urban development and of human welfare is the state of the national and regional economies. Industrial expansion or contraction directly affects the local residents where it really matters. But employment and income levels are shaped almost exclusively by decisions made by distant governments and in a multiplicity of widely scattered individual firms, each responding to market conditions that it has only slight control over. Medical, educational, and the other services that people care about most are supplied by a wide array of nonprofit and profit-making establishments. Despite the ideological rigidity that marks these groups, their programs must constantly be adapted to changing conditions within their respective markets.

The problems associated with race and poverty, currently being exacerbated by the rapid pace of cybernation, are surely the most difficult of the social issues facing the major cities. Their origins lie largely outside the cities where they are manifested, however, and almost wholly outside the municipalities' influence. Unfortunately we still have very few workable ideas for dealing with this growing social dilemma. At best we can hope for some

imaginative experiments to test different sorts of programs, dropping those that fail, building on those that show some promise of helping to relieve distress, feeling our way through the course of future time in an effort to improve conditions, but always uncertain of the odds. A master plan that showed some desired future state for the presently poor without also showing the methods for attaining it could scarcely command much attention.

IN SEARCH OF A PROGRAMMING STRATEGY

Many planners are therefore searching for an action-shaping approach to planning and deciding that might succeed in those fields where the traditional end-stating approaches cannot. Most of these explorations are trying to develop methods for formulating some types of programmatic, goal-directed courses of action. The by-now-classic formulation that underlies most of the current experiments was succinctly summarized in 1955 by Edward C. Banfield. He described the process of rational decision-making as comprising the following planning strategy:

1. the decision-maker considers all of the alternatives (courses of action) open to him; i.e., he considers what courses of action are possible within the conditions of the situation and in the light of the ends he seeks to attain; 2. he identifies and evaluates all of the consequences which would follow from the adoption of each alternative; i.e., he predicts how the total situation would be changed by each course of action he might adopt; and 3. he selects that alternative the probable consequences of which would be preferable in terms of his most valued ends.⁴

Banfield then goes on to recognize that one can never identify all alternative courses of action or all consequences, and that rationality is necessarily bounded, but suggests that this model represents an unattainable ideal toward which we nonetheless should strive.

A year later, in a seminal paper presented to the American Institute of Planners, Martin Meyerson spelled out the operational framework for such a programmatic strategy.⁵ His formulation of continuous market analysis, periodic reports on the state of system behavior, action programs oriented to the middle-range future, and continuous post-hoc testing of predicted consequences, has won wide acceptance in recent years. The passage of the federal Community Renewal Program (CRP) legislation followed three years later in 1959; and, by now, CRP staffs in several major cities are working to frame such developmental programs—one-to-ten-year courses of action.

In brief, these efforts are drawing upon whatever is usable in social science theory in attempting to design operational models capable of predicting the repercussions of alternative public or private actions in one subsystem on a network of other subsystems. Some experimentation is under way with decision models that would have the further capability of interpreting desirable actions from preestablished decision rules. There is some optimism abroad that we might also be able to estimate optimal timing of sequenced actions. In some circles, there is now beginning optimism that, in addition to predicting efficiency effects of alternative actions, we may also be able to predict distributions of benefits and costs to the various publics that would be affected. Surely if these methods could be made to work, legislators could better

know what to *want* and more rationally decide what to *do*.

But during the past few years the growing confidences in even this sophisticated formulation have been increasingly clouded. The wave of urban politics studies began flooding the bookstores in 1961. They have essentially discredited both the popular image of a monolithic power-elite and the civics-book portrait of a deliberative and selflessly rational city council. Only rarely, it appears, is it possible for either an extra-governmental or a governmental legislature to make forthright decisions across the municipal and local-industrial board. They report that it is only rarely possible to make coordinated decisions from a central command post for even a few of the urban subsystems. Instead, these studies portray multitudes of separate groups, each pursuing somewhat different bundles of objectives, participating segmentally in decisions that affect their several interests.

Except for the government bureaus and private clubs that are stabilized and controlled by the professional ideologies, the groups seem to form in ad hoc fashion around each current issue, such that the membership in each, and the variable interests they reflect, merge into each other at their fuzzy boundaries. Without a single decision center, coordination of even a few municipal agencies' activities seems difficult, and hence unlikely.

Rather more serious doubts have been raised by Charles Lindblom and his associates, however. Contending that the only possible and the most effective tactic is one of "disjointed incrementalism," they reject the Banfield-Meyerson strategy that would seek to explicate alternative means in each subsystem, to trace their repercussions on the others, and then to select those means that seem most efficient in accomplishing system-wide ends. "Instead of adjusting means to ends," Lindblom observes, "ends are chosen that are appropriate to the available means. . . . Ends and means are chosen simultaneously." With Karl Popper,⁶ he contends that, necessarily, "analysis and policy making are remedial; they move *away* from ills rather than *toward* known objectives," and that "the analysis of consequences is quite incomplete," thus "no attempt at comprehensiveness is made."⁷

If comprehensive analysis and decision are not feasible, then we can never hope to optimize for whole systems, and the classic program-design strategy may be no more workable than the end-state approach. But Lindblom and his colleagues are arguing, further, that even suboptimization is impossible. At best, they would contend, one can hope to take only small, marginal decisions and actions with respect to subsystems, such that each might help to relieve the most undesired conditions as they emerge through time. Thus, if Lindblom's strategy were pursued, we need not bother ourselves with either the dilemmas tied to identifying long-term goals or with the complexities of designing coherent courses of action. Instead, each of us, in our plural roles, need deal only segmentally, on a day-to-day basis, with the fragments of problems that fall within the purview of our competences and interests—each of us promoting those ends-means chains we happen to prefer at the moment.

But an alternative approach is emerging that might answer some of Lindblom's most cutting criticisms. It is the tactic of *programming*, as alternative to *program-making* or *plan-making*. It calls for the installation of decision-aiding processes that might never yield a formal

program for even middle-run actions. Rather, it would support the incremental, multi-centered processes of deciding and acting; but it would expand the probabilities that these decisions and actions would be taken more rationally. I shall have a word to say about this planning method shortly, for I believe it will serve us as an interim strategy until some resolutions of the inconsistencies within planning theory can be found.

However persuasive Lindblom's way of thinking, and however common incremental decision-making may be, we nonetheless know that governments, unlike even the largest corporations, *are* able to take big investment leaps. Since governments in the United States do not face bankruptcy or political overthrow, they are able to undertake larger and higher-risk projects than can some foreign governments or corporations in this country. If the project should fail to bring expected returns, it really doesn't matter much. And so, governmental planners are encouraged to think big, and to recommend actions that would induce parametric changes in the urban system. The success of the British town planners in changing the rules of city building in England, and the success of the Puerto Rican planners in helping to transform an agrarian society to industrial status in less than a generation, suggest that even though planned parametric change may be uncommon, it is nonetheless possible.

Because governmental accounting systems do not require short-run payoffs, and because many developments in cities will be generating their consequences over the long-run future, city planners have typically adopted longer-term planning horizons than have other planners. And, equally important, because the substantive concerns of general government are much more inclusive than are those of individual firms or individual governmental departments, city planners have been induced to search for higher-level optima than do those who work in agencies or firms dealing with parts of subsystems.

Despite the impossibility of rationally planning for the whole urban system, the traditions of city planning have led us to try to find optima for at least somewhat larger wholes than are typically sought elsewhere. Dyckman voiced the city planners' optimism in this respect when he said,

there is some evidence that the city planners may, in the long run, make a contribution to urban studies as well as to the necessary social and physical engineering. For if deficient in certain techniques, the city planners, or at least the best trained of them, are equipped to ask the right questions. The synthetic, organizing role of city planning, which once might have been dismissed as "holistic" nonsense or Bergsonian mysticism, becomes, in a world of expanded technical possibilities, a valuable approach.⁸

AN INTERIM PROGRAMMING STRATEGY

Even though planning theory is in so unresolved a state (and I've mentioned only a few of the troublesome questions) the current experiments with program-type methods suggest that we may eventually locate some routes out of the maze. Meanwhile, even though we have growing doubts about traditional planning procedures, and even though we accept the many new warnings about the bounds of rationality, we do have some growing con-

fidence that certain types of planning activity will return profitable payoffs. There is still a great deal that planners can now do to improve the quality of decisions and actions, even recognizing that human cognitive capacities are highly limited, that knowledge is always in terribly short supply, that our theory is still very primitive, that we still don't know how to discount future values or to estimate present benefits and costs, that we shall probably never find optima for total systems that are marked by multiple goals, and that, at best, we can hope to make only slight improvements in predictions.

Among the most valuable things we can do is just to supply better information about the current states of affairs in the various urban subsystems. William Wheaton recently argued this proposition persuasively by describing the confusions and the gross irrationalities that abound in metropolitan decision-making. In summarizing his observations of public and private investors' behavior, he concluded that

the market facts are not widely available or widely understood, . . . [and] *this* is the *determining* factor in an overwhelming majority of decisions being made. The simple act of providing facts regarding market trends in usable form, [and] accessible to deciders, would make a real difference in our urban development rates.⁹

The readers of this *Journal* would be quick to join in his appeal and with his second-order entreaty for improved predictions of at least the short-run changes.

These simple-sounding demands are, of course, nothing of the sort. Data are terribly expensive commodities. Although the utility of good information and good analysis is coming to be widely appreciated in political circles (witness the vast sums spent by the presidential candidates last year for survey-research into voter preferences), adequate financing for urban data is still hard to come by. But that's almost the least of it. An adequate urban intelligence center would need to maintain current inventories of both stocks and flows relating to characteristics of, at least, people, property, and the activities of organized groups (such as sales, shipments, bank clearings). But *which* characteristics should be monitored depends upon the theoretic formulations we believe best explain the workings of the systems they belong to and best reflect the evaluative preferences that deciders hold to.

In this light it is becoming apparent that many of the new data banks are little more than grab-bag collections of data for which no theoretic bases exist. Like the drunk who was searching for his lost keys under the lamp post because the light was better there, many of the new data banks seem to be storing data just because these specific numbers happen to be easy to get. The models that serve policy-making and action may call for very different numbers, and so we can expect that as the banks become informed by urban theory, they will turn their large storage and computing capacities to the information that might prove useful.

The relations between data selection and theory are reciprocal, of course. It is therefore equally important that an urban intelligence center be as purposefully directed to identifying potentially fruitful research and potentially effective social experiments, as it is to supplying current inventories. Such theory-oriented work will identify new types of useful data that would contribute to the next rounds of social action. In turn, the continuing processes of social action, if carefully monitored and

imaginatively evaluated, can further improve the theory that effective action depends upon.

Many are thus coming to visualize an idealized urban intelligence center, that is, an effective city planning agency, as being equally oriented to improving theory and action, for we know that the dualism that would distinguish them is false. In contrast to a mere "information center," such an intelligence center would seek to describe and explain what is going on, to report on stocks and flows, and to identify cause-and-effect relations. Using simulation-type techniques, it would try to predict what would happen *if* one course-of-action were taken rather than some other, and to trace the repercussions of those actions through as many of the subsystems as our theory and data permit. By thus feeding-forward predictions of likely outcomes, the center would inevitably become an agent of change, affecting actions and subsequent outcomes. Flatly rejecting the notion that it can serve a single client, it would seek to supply information on current conditions and predictions of future conditions to many interested parties, in addition to the city council that pays its bills. In an effort to test accuracy of predictions and adequacy of the theory underlying the predictions, its monitoring stations must be set up at key junctions throughout the urban system and the signals continuously fed back. It need not presume that control is centralized at any specific decision points or that consistent courses of action will be pursued by anybody. Rather, each of the multiplicity of groups would be aided in searching out its own objectives and its own best current actions.

For those few groups whose objectives are clear and whose authority systems permit them to chart long-term and consistent programs of action, such an intelligence center could become an especially valuable resource. If predictive models were good enough, the center could help them to design targets (accomplishment levels tied to specific future dates), programs (detailed, time-sequenced steps to be taken), and prearranged strategies (alternative programs that say what to do when the meters indicate that anticipated events are not occurring). Some groups would never adopt such formal targets, programs, and strategies, however. For some, even the goal directions shift with changing external conditions, and if data on developing events can be continuously fed-back into the intelligence system, these deciders could better operate simultaneously as short-run opportunists and as long-run goal-seekers. Similarly, they can operate simultaneously (although segmentally, of course) as Wheaton-type informed deciders, as Banfield-Meyerson-type middle-run programmers, as Lindblom-type particularistic incrementalists, and as Dyckman-type seekers after higher-level optima. With the multiplicity of diverse groups chasing divergent goals, it is quite unlikely that they would ever behave consistently on all matters or operate collectively as members of an integrated team.

III The Politics of Information

Nothing I have been saying is intended to imply that the men who would staff such a sophisticated intelligence center could be, in any sense, the dispassionately objective scientists of either the old Technocracy school of social engineers or the more recent schools of scientific positivism. Whether we like it or not, social science, and

especially policy-oriented social science cannot be value-free science.

In a field such as astronomy, one's observations and theoretic generalizations are very unlikely to make much difference to the phenomena being observed. The remarkable discoveries in astronomy since the war have led to some striking new theories about the histories of stars and the history of the universe, but the stars and the universe are wholly unaffected by them. In the social sciences, however, as John Seeley has perceptively described it, to report one's observations is to change the phenomenon being observed.¹⁰

To inform a shopping-center investor about consumer travel behavior and about market potentials is to shape his decisions about shopping-center locations and tenant mix. In turn, those decisions will influence the decisions of merchants, shoppers, house-builders, bankers, and others; and they will thus affect the behavioral and market conditions that were initially observed. To supply the facts on national income distribution, as Keyserling and Harrington recently did, was to set loose a chain of responses that may yet change the distributional facts that were initially reported. The same sort of thing happens with forecasts, of course, as business-cycle theorists and stock-exchange brokers have long known.

Seemingly straightforward facts about societal things and events are seldom, if ever, value neutral. They inevitably intervene into the workings of the systems they describe. The information supplier, whatever his motives and methods, is therefore inevitably immersed in politics. The kinds of facts he selects to report, the way he presents them, the groups they are distributed to, and the inferences he invites each work to shape subsequent outcomes—subsequent facts.

The current interest in better urban information mirrors a spreading recognition that facts available to actors shape their actions, and hence the belief that better information will make for better actions. But I raise these questions because I find a misconception among some urban scientists who believe that information, per se, is nonpolitical—that as “pure scientists” they can stand outside the system and, with positivistic detachment, record and explain what they see. This perception of dualistic roles is patently distorted. The scientist, no less than the politician or the merchant, is *inside* the system, and his work affects its workings. None of us can escape the fact that our facts are instruments of change. To play the role of scientist in the urban field is also to play the role of intervener, however indirect and modest the interventions may be.

This outcome is reinforced by the large political and economic capital that information represents. Information, like money, yields power to those who've got it. And, like money, the ways in which it is distributed will determine which groups will be favored and which deprived.

Accordingly, an urban intelligence center could in no sense operate as a neutral informant. Even if it somehow *could* succeed in becoming a nonpartisan supplier of information, making its findings available to all comers, this in itself would represent a powerful intervention into economic, political, and social processes. To redistribute information-income in such fashion would dramatically change the rules of the political and economic games that are played in the metropolitan arena. To reduce secrecy

would reduce the advantages that redounded to those favored few who used to be in on the secrets. To reduce ignorance among those groups that cannot now afford the high costs of good intelligence would strengthen their political and economic positions. To supply comparable information to all interested parties, would broaden the spectrum of consensus and might thereby increase the odds of mutually reinforcing actions.

Of course, nothing even approximating equality of access to information is likely, even if an intelligence center were to be established and supported by a diversified group of governments, industries, and foundations. The power that such a center would represent is already clear to many; indeed, this is one of the reasons that financing has been hard to get. As city planning agencies grow to become intelligence centers, however, we can expect a growing partisan competition to gain control over their activities and to limit outputs; for information of some types can be a very dangerous weapon. Thus, the social-scientist-types who would staff them would immediately find themselves intimately involved in internal politics over the centers' programs, mirroring the external politics of the metropolis.

Which studies should be conducted? Which models employed? Which data collected? Which variables accounted? Which analyses made? Which forecasts attempted? Which alternatives explored? Which conclusions reported? And which findings and recommendations reported to which of the competing groups? The staff may wish to believe that their science can supply the answers. But, however true that may be, it is equally true that, simultaneously, these would also be political answers of a straightforward sort.

Conclusion

Very few, if any, general decision rules are relevant to all the separate groups operating in an urban area. Each group seeks its own survival, its own special types of advantage, its own uniquely perceived images of self and public welfare. Thus, an elected official may promote a costly public-works project as a way of stabilizing his political position. If the analyst should fail to include these so-called “noneconomic variables” in calculating expected returns from the investment, he of course misses the main point. If he does account for them, he aligns himself with the interests of one partisan group against others. A businessmen's group may seek to redevelop a section of the central business district, ostensibly to “revitalize the city's heart” and thereby to “serve the public interest”; but unless the analyst is alert to the real motives driving the project, his information is not likely to give them the indicators of success they really want. And, again, if he should serve their purposes, he aligns himself with the project's proponents and against the opponents. I point these rather homey examples to say that the man who would pursue the urban information sciences thereby chooses a career in politics—politics in the vernacular sense, for he cannot avoid the posture of protagonist.

But he thereby also chooses a political career in its grander meaning—he becomes a policy-shaper if not a policy-maker. In playing the roles of producer of new facts, as identifier and evaluator of potential action-

courses, and as prophet of the future, he thereby plays the role of planner. His position requires that he say what he thinks *ought* to happen, as well as to say what *might* happen.

By now it should be clear that I do not pose these as duals. Rather, I am saying that it is impossible to separate the "is-type" propositions from the "ought-type." To report what is, or what is expected to be, unavoidably shapes what is likely to be. In a way different from the workings of Merton's self-fulfilling prophecy, the inherent consequence of producing information is to influence actions; and, motivations aside, to say what is, and hence to affect what will be, is inseparable from saying what should be.

It is also clear that planners must perforce say what they would like to happen. With their superior knowledge of the system's structure, its processes, and the value-ranked wants of the various publics, planners who can draw upon an elaborate intelligence center might be well-equipped to design action-programs having high odds of bringing high welfare returns. Competence in the positive aspects of the sciences strengthens competence in the normative aspects.

The ablest students of human problems have often known their clients' wants better than the clients have, and they have often known better what the clients should do. (Flouridation is an apt example here, if accounting the paranoic need for an aggressor be temporarily suspended.) To be sure, clients are wont to ignore their counsellors, sometimes at their own loss (and again flouridation illustrates my point). But the socially responsible student, or planner, or scientist—choose whichever name you happen to like best—has an ethical obligation to say what he thinks *ought* to be, no less than that the early atomic physicists were obligated to report their findings as best they understood them and the physician is obligated to advise his patient to submit to unpleasant therapy.

In this respect, the scientist-politician-planner may be of a peculiar breed in the political scene. Like all other political actors, he is surely a member of an interest group composed of peers who share his particular frames of reference and, hence, his social objectives. With them, he sees the world through special filters and holds vested interests in certain concepts, analytic methods, and social programs. With them, he tries to sell his particular brands of rationality and his particular images of the social welfare. Despite the weakening boundaries between professions, his beliefs and intellectual style are likely to have been shaped by the profession that reared him. He is likely still to believe that its variables are more critical than others, to believe that its thoughtways are more productive, and to value its brands of objectives more highly than others.

His special character mirrors the special character of science. To a degree far less common in other interest groups, he has learned to *doubt*; to question his beliefs, his data, and his findings; to submit his conclusions to critical evaluation by his peers; to tolerate uncertainty and ambiguity; to bear the frustrations of not knowing, and of knowing he does not know; and, by far the most important, to adopt the empirical test for validity.

As much as the improved facts, the improved modes of predicting, and the disciplined imagination that he brings,

it is the new injection of the *scientific morality* into urban policy-making that makes the saturation of scientific talent into urban affairs a happy event. Partisanship, parochialism, and partial knowledge are inherent to the urban system, as they are to science. The intelligence centers can never eliminate them. The new planners must accept them as facts, no less real and valid than rents, transport costs, interest rates, and topographic conditions. By more systematically accounting for these variables, however, and by then exposing alternative action and value hypotheses to critical and systematic examination, those in the information-and-planning sciences may help to eliminate the most negative consequences of partisanship and of ignorance.

By offering their own preferred images of private-public welfares, their own perceptions of good ends-means, and their own proposals for social programs, the new hybrid species of urban planners are likely to make significant contributions to ameliorating social problems. With so many different types of professionals now converging upon city planning, and with such large public investment being made to support their efforts, we shall not have to wait long to find out if they will.

NOTES

¹ Morton Grodzins, "The Federal System," in *Goals for Americans: The Report of the President's Commission on National Goals* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960) pp. 265-284. See also his "Centralization and Decentralization in the American Federal System," in *A National of States: Essays on the American Federal System* (New York: Rand McNally & Co., 1963) pp. 1-23.

² I tried to state the positive case for future-state plans in a paper entitled "Prospect for Policies Planning," in Leonard J. Duhl (ed.), *The Urban Condition* (New York: Basic Books, Inc., 1963), pp. 319-330.

³ The contrast between city plans in the United States and town plans in other places and times is great. Eugene Rostow has insightfully noted that virtually all the European and Asian cities that are generally admired were designed and built under the direction and control of authoritarian rulers.

⁴ Martin Meyerson and Edward C. Banfield, *Politics, Planning and the Public Interest: The Case of Public Housing in Chicago* (Glencoe: The Free Press, 1955), "Supplement: Note on Conceptual Scheme," p. 314.

⁵ Martin Meyerson, "Building the Middle-Range Bridge for Comprehensive Planning," *A.I.P. Journal*, XXII:2 (Spring 1956), 58-64. This formulation was anticipated in an unpublished paper by Harvey S. Perloff, "Form and Function of Master Planning in Puerto Rico," (mimeo.) January, 1952.

⁶ Karl R. Popper, *The Open Society and Its Enemies*, (New York: Harper & Row, Torchbook edition, 1963), Vol. 1, 158.

⁷ Albert O. Hirschman and Charles E. Lindblom, "Economic Development, Research and Development, Policy Making: Some Converging Views," *Behavioral Science*, VII:2 (April, 1962) 215-216. See also his more thorough development of this thesis in David Braybrooke and Charles E. Lindblom, *A Strategy of Decision* (New York: The Free Press of Glencoe, 1963).

⁸ John W. Dyckman, "The Scientific World of the City Planners," *The American Behavioral Scientist*, VI:6 (February, 1963), 49.

⁹ William L. C. Wheaton, "Public and Private Agents of Change," in Melvin M. Webber and others, *Explorations into Urban Structure* (Philadelphia: University of Pennsylvania Press, 1964), p. 189. (Italics added.)

¹⁰ John R. Seeley, "Social Science? Some Probative Problems," in Maurice Stein and Arthur Vidich (eds), *Sociology on Trial* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), pp. 53-65.

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