The Science of "Muddling Through"

By CHARLES E. LINDBLOM

Associate Professor of Economics
Yale University

➤ Short courses, books, and articles exhort administrators to make decisions more methodically, but there has been little analysis of the decision-making process now used by public administrators. The usual process is investigated here—and generally defended against proposals for more "scientific" methods.

Decisions of individual administrators, of course, must be integrated with decisions of others to form the mosaic of public policy. This integration of individual decisions has become the major concern of organization theory, and the way individuals make decisions necessarily affects the way those decisions are best meshed with others'. In addition, decision-making method relates to allocation of decision-making responsibility—who should make what decision.

More "scientific" decision-making also is discussed in this issue: "Tools for Decision-Making in Resources Planning."

SUPPOSE an administrator is given responsibility for formulating policy with respect to inflation. He might start by trying to list all related values in order of importance, e.g., full employment, reasonable business profit, protection of small savings, prevention of a stock market crash. Then all possible policy outcomes could be rated as more or less efficient in attaining a maximum of these values. This would of course require a prodigious inquiry into values held by members of society and an equally prodigious set of calculations on how much of each value is equal to how much of each other value. He could then proceed to outline all possible policy alternatives. In a third step, he would undertake systematic comparison of his multitude of alternatives to determine which attains the greatest amount of values.

In comparing policies, he would take advantage of any theory available that generalized about classes of policies. In considering inflation, for example, he would compare all policies in the light of the theory of prices. Since no alternatives are beyond his investigation, he would consider strict central control and the abolition of all prices and markets on the one hand and elimination of all public controls with reliance completely on the free market on the other, both in the light of whatever theoretical generalizations he could find on such hypothetical economies.

Finally, he would try to make the choice that would in fact maximize his values.

An alternative line of attack would be to set as his principal objective, either explicitly or without conscious thought, the relatively simple goal of keeping prices level. This objective might be compromised or complicated by only a few other goals, such as full employment. He would in fact disregard most other social values as beyond his present interest, and he would for the moment not even attempt to rank the few values that he regarded as immediately relevant. Were he pressed, he would quickly admit that he was ignoring many related values and many possible important consequences of his policies.

As a second step, he would outline those relatively few policy alternatives that occurred to him. He would then compare them. In comparing his limited number of alternatives, most of them familiar from past controversies, he would not ordinarily find a body of theory precise enough to carry him through a comparison of their respective consequences. Instead he would rely heavily on the record of past experience with small policy steps to predict the consequences of similar steps extended into the future.

Moreover, he would find that the policy alternatives combined objectives or values in different ways. For example, one policy might offer price level stability at the cost of some

risk of unemployment; another might offer less price stability but also less risk of unemployment. Hence, the next step in his approach—the final selection—would combine into one the choice among values and the choice among instruments for reaching values. It would not, as in the first method of policy-making, approximate a more mechanical process of choosing the means that best satisfied goals that were previously clarified and ranked. Because practitioners of the second approach expect to achieve their goals only partially, they would expect to repeat endlessly the sequence just described, as conditions and aspirations changed and as accuracy of prediction improved.

By Root or by Branch

For complex problems, the first of these two approaches is of course impossible. Although such an approach can be described, it cannot be practiced except for relatively simple problems and even then only in a somewhat modified form. It assumes intellectual capacities and sources of information that men simply do not possess, and it is even more absurd as an approach to policy when the time and money that can be allocated to a policy problem is limited, as is always the case. Of particular importance to public administrators is the fact that public agencies are in effect usually instructed not to practice the first method. That is to say, their prescribed functions and constraints—the politically or legally possible—restrict their attention to relatively few values and relatively few alternative policies among the countless alternatives that might be imagined. It is the second method that is practiced.

Curiously, however, the literatures of decision-making, policy formulation, planning, and public administration formalize the first approach rather than the second, leaving public administrators who handle complex decisions in the position of practicing what few preach. For emphasis I run some risk of overstatement. True enough, the literature is well aware of limits on man's capacities and of the inevitability that policies will be approached in some such style as the second. But attempts to formalize rational policy formulation—to lay out explicitly the necessary steps in the process—usually describe the first approach and not the second.[1]

The common tendency to describe policy formulation even for complex problems as though it followed the first approach has been strengthened by the attention given to, and successes enjoyed by, operations research, statistical decision theory, and systems analysis. The hallmarks of these procedures, typical of the first approach, are clarity of objective, explicitness of evaluation, a high degree of comprehensiveness of overview, and, wherever possible, quantification of values for mathematical analysis. But these advanced procedures remain largely the appropriate techniques of relatively small-scale problem-solving where the total number of variables to be considered is small and value problems restricted. Charles Hitch, head of the Economics Division of RAND Corporation, one of the leading centers for application of these techniques, has written:

> I would make the empirical generalization from my experience at RAND and elsewhere that operations research is the art of sub-optimizing, i.e., of solving some lower-level problems, and that difficulties increase and our special competence diminishes by an order of magnitude with every level of decision making we attempt to ascend. The sort of simple explicit model which operations researchers are so proficient in using can certainly reflect most of the significant factors influencing traffic control on the George Washington Bridge, but the proportion of the relevant reality which we can represent by any such model or models in studying, say, a major foreign-policy decision, appears to be almost trivial.[2]

Accordingly, I propose in this paper to clarify and formalize the second method,

[1] James G. March and Herbert A. Simon similarly characterize the literature. They also take some important steps, as have Simon's recent articles, to describe a less heroic model of policy-making. See *Organizations* (John Wiley and Sons, 1958), p. 137.

[2] "Operations Research and National Planning—A Dissent," 5 *Operations Research* 718 (October, 1957). Hitch's dissent is from particular points made in the article to which his paper is a reply; his claim that operations research is for low-level problems is widely accepted.

For examples of the kind of problems to which operations research is applied, see C. W. Churchman, R. L. Ackoff and E. L. Arnoff, *Introduction to Operations Research* (John Wiley and Sons, 1957); and J. F. McCloskey and J. M. Coppinger (eds.), *Operations Research for Management*, Vol. II, (The Johns Hopkins Press, 1956).

much neglected in the literature. This might be described as the method of *successive limited comparisons*. I will contrast it with the first approach, which might be called the rational-comprehensive method.[3] More impressionistically and briefly—and therefore generally used in this article—they could be characterized as the branch method and root method, the former continually building out from the current situation, step-by-step and by small degrees; the latter starting from fundamentals anew each time, building on the past only as experience is embodied in a theory, and always prepared to start completely from the ground up.

Let us put the characteristics of the two methods side by side in simplest terms.

Rational-Comprehensive (Root)	Successive Limited Comparisons (Branch)
1a. Clarification of values or objectives distinct from and usually prerequisite to empirical analysis of alternative policies.	1b. Selection of value goals and empirical analysis of the needed action are not distinct from one another but are closely intertwined.
2a. Policy-formulation is therefore approached through means-end analysis: First the ends are isolated, then the means to achieve them are sought.	2b. Since means and ends are not distinct, means-end analysis is often inappropriate or limited.
3a. The test of a "good" policy is that it can be shown to be the most appropriate means to desired ends.	3b. The test of a "good" policy is typically that various analysts find themselves directly agreeing on a policy (without their agreeing that it is the most appropriate means to an agreed objective).
4a. Analysis is comprehensive; every important relevant factor is taken into account.	4b. Analysis is drastically limited: i) Important possible outcomes are neglected. ii) Important alternative potential policies are neglected. iii) Important affected values are neglected.
5a. Theory is often heavily relied upon.	5b. A succession of comparisons greatly reduces or eliminates reliance on theory.

Assuming that the root method is familiar and understandable, we proceed directly to clarification of its alternative by contrast. In explaining the second, we shall be describing how most administrators do in fact approach complex questions, for the root method, the "best" way as a blueprint or model, is in fact not workable for complex policy questions, and administrators are forced to use the method of successive limited comparisons.

Intertwining Evaluation and Empirical Analysis (1b)

The quickest way to understand how values are handled in the method of successive limited comparisons is to see how the root method often breaks down in *its* handling of values or objectives. The idea that values should be clarified, and in advance of the examination of alternative policies, is appealing. But what happens when we attempt it for complex social problems? The first difficulty is that on many critical values or objectives, citizens disagree, congressmen disagree, and public administrators disagree. Even where a fairly specific objective is prescribed for the administrator, there remains considerable room for disagreement on sub-objectives. Consider, for example, the conflict with respect to locating public housing, described in Meyerson and Banfield's study of the Chicago Housing Authority[4]—disagreement which occurred despite the clear objective of providing a certain number of public housing units in the city. Similarly conflicting are objectives in highway location, traffic control, minimum wage administration, development of tourist facilities in national parks, or insect control.

Administrators cannot escape these conflicts by ascertaining the majority's preference, for preferences have not been registered on most issues; indeed, there often *are* no preferences in the absence of public discussion sufficient to bring an issue to the attention of the electorate. Furthermore, there is a question

[3] I am assuming that administrators often make policy and advise in the making of policy and am treating decision-making and policy-making as synonymous for purposes of this paper.

[4] Martin Meyerson and Edward C. Banfield, *Politics, Planning and the Public Interest* (The Free Press, 1955).

of whether intensity of feeling should be considered as well as the number of persons preferring each alternative. By the impossibility of doing otherwise, administrators often are reduced to deciding policy without clarifying objectives first.

Even when an administrator resolves to follow his own values as a criterion for decisions, he often will not know how to rank them when they conflict with one another, as they usually do. Suppose, for example, that an administrator must relocate tenants living in tenements scheduled for destruction. One objective is to empty the buildings fairly promptly, another is to find suitable accommodation for persons displaced, another is to avoid friction with residents in other areas in which a large influx would be unwelcome, another is to deal with all concerned through persuasion if possible, and so on.

How does one state even to himself the relative importance of these partially conflicting values? A simple ranking of them is not enough; one needs ideally to know how much of one value is worth sacrificing for some of another value. The answer is that typically the administrator chooses—and must choose—directly among policies in which these values are combined in different ways. He cannot first clarify his values and then choose among policies.

A more subtle third point underlies both the first two. Social objectives do not always have the same relative values. One objective may be highly prized in one circumstance, another in another circumstance. If, for example, an administrator values highly both the dispatch with which his agency can carry through its projects *and* good public relations, it matters little which of the two possibly conflicting values he favors in some abstract or general sense. Policy questions arise in forms which put to administrators such a question as: Given the degree to which we are or are not already achieving the values of dispatch and the values of good public relations, is it worth sacrificing a little speed for a happier clientele, or is it better to risk offending the clientele so that we can get on with our work? The answer to such a question varies with circumstances.

The value problem is, as the example shows, always a problem of adjustments at a margin. But there is no practicable way to state marginal objectives or values except in terms of particular policies. That one value is preferred to another in one decision situation does not mean that it will be preferred in another decision situation in which it can be had only at great sacrifice of another value. Attempts to rank or order values in general and abstract terms so that they do not shift from decision to decision end up by ignoring the relevant marginal preferences. The significance of this third point thus goes very far. Even if all administrators had at hand an agreed set of values, objectives, and constraints, and an agreed ranking of these values, objectives, and constraints, their marginal values in actual choice situations would be impossible to formulate.

Unable consequently to formulate the relevant values first and then choose among policies to achieve them, administrators must choose directly among alternative policies that offer different marginal combinations of values. Somewhat paradoxically, the only practicable way to disclose one's relevant marginal values even to oneself is to describe the policy one chooses to achieve them. Except roughly and vaguely, I know of no way to describe—or even to understand—what my relative evaluations are for, say, freedom and security, speed and accuracy in governmental decisions, or low taxes and better schools than to describe my preferences among specific policy choices that might be made between the alternatives in each of the pairs.

In summary, two aspects of the process by which values are actually handled can be distinguished. The first is clear: evaluation and empirical analysis are intertwined; that is, one chooses among values and among policies at one and the same time. Put a little more elaborately, one simultaneously chooses a policy to attain certain objectives and chooses the objectives themselves. The second aspect is related but distinct: the administrator focuses his attention on marginal or incremental values. Whether he is aware of it or not, he does not find general formulations of objectives very helpful and in fact makes specific marginal or incremental comparisons. Two policies, X and Y, confront him. Both promise the same degree of attainment of objectives *a, b, c, d,* and *e*. But X promises him somewhat more of *f* than does Y, while Y promises him somewhat more of *g* than does

X. In choosing between them, he is in fact offered the alternative of a marginal or incremental amount of f at the expense of a marginal or incremental amount of g. The only values that are relevant to his choice are these increments by which the two policies differ; and, when he finally chooses between the two marginal values, he does so by making a choice between policies.[5]

As to whether the attempt to clarify objectives in advance of policy selection is more or less rational than the close intertwining of marginal evaluation and empirical analysis, the principal difference established is that for complex problems the first is impossible and irrelevant, and the second is both possible and relevant. The second is possible because the administrator need not try to analyze any values except the values by which alternative policies differ and need not be concerned with them except as they differ marginally. His need for information on values or objectives is drastically reduced as compared with the root method; and his capacity for grasping, comprehending, and relating values to one another is not strained beyond the breaking point.

Relations Between Means and Ends (2b)

Decision-making is ordinarily formalized as a means-ends relationship: means are conceived to be evaluated and chosen in the light of ends finally selected independently of and prior to the choice of means. This is the means-ends relationship of the root method. But it follows from all that has just been said that such a means-ends relationship is possible only to the extent that values are agreed upon, are reconcilable, and are stable at the margin. Typically, therefore, such a means-ends relationship is absent from the branch method, where means and ends are simultaneously chosen.

Yet any departure from the means-ends relationship of the root method will strike some readers as inconceivable. For it will appear to them that only in such a relationship is it possible to determine whether one policy choice is better or worse than another. How can an administrator know whether he has made a wise or foolish decision if he is without prior values or objectives by which to judge his decisions? The answer to this question calls up the third distinctive difference between root and branch methods: how to decide the best policy.

The Test of "Good" Policy (3b)

In the root method, a decision is "correct," "good," or "rational" if it can be shown to attain some specified objective, where the objective can be specified without simply describing the decision itself. Where objectives are defined only through the marginal or incremental approach to values described above, it is still sometimes possible to test whether a policy does in fact attain the desired objectives; but a precise statement of the objectives takes the form of a description of the policy chosen or some alternative to it. To show that a policy is mistaken one cannot offer an abstract argument that important objectives are not achieved; one must instead argue that another policy is more to be preferred.

So far, the departure from customary ways of looking at problem-solving is not troublesome, for many administrators will be quick to agree that the most effective discussion of the correctness of policy does take the form of comparison with other policies that might have been chosen. But what of the situation in which administrators cannot agree on values or objectives, either abstractly or in marginal terms? What then is the test of "good" policy? For the root method, there is no test. Agreement on objectives failing, there is no standard of "correctness." For the method of successive limited comparisons, the test is agreement on policy itself, which remains possible even when agreement on values is not.

It has been suggested that continuing agreement in Congress on the desirability of extending old age insurance stems from liberal desires to strengthen the welfare programs of the federal government and from conservative desires to reduce union demands for private pension plans. If so, this is an excellent demonstration of the ease with which individuals of different ideologies often can agree on concrete policy. Labor mediators report a similar phenomenon: the contestants cannot agree on criteria for settling their disputes but can agree on specific proposals. Similarly, when

[5] The line of argument is, of course, an extension of the theory of market choice, especially the theory of consumer choice, to public policy choices.

one administrator's objective turns out to be another's means, they often can agree on policy.

Agreement on policy thus becomes the only practicable test of the policy's correctness. And for one administrator to seek to win the other over to agreement on ends as well would accomplish nothing and create quite unnecessary controversy.

If agreement directly on policy as a test for "best" policy seems a poor substitute for testing the policy against its objectives, it ought to be remembered that objectives themselves have no ultimate validity other than they are agreed upon. Hence agreement is the test of "best" policy in both methods. But where the root method requires agreement on what elements in the decision constitute objectives and on which of these objectives should be sought, the branch method falls back on agreement wherever it can be found.

In an important sense, therefore, it is not irrational for an administrator to defend a policy as good without being able to specify what it is good for.

Non-Comprehensive Analysis (4b)

Ideally, rational-comprehensive analysis leaves out nothing important. But it is impossible to take everything important into consideration unless "important" is so narrowly defined that analysis is in fact quite limited. Limits on human intellectual capacities and on available information set definite limits to man's capacity to be comprehensive. In actual fact, therefore, no one can practice the rational-comprehensive method for really complex problems, and every administrator faced with a sufficiently complex problem must find ways drastically to simplify.

An administrator assisting in the formulation of agricultural economic policy cannot in the first place be competent on all possible policies. He cannot even comprehend one policy entirely. In planning a soil bank program, he cannot successfully anticipate the impact of higher or lower farm income on, say, urbanization—the possible consequent loosening of family ties, possible consequent eventual need for revisions in social security and further implications for tax problems arising out of new federal responsibilities for social security and municipal responsibilities for urban services. Nor, to follow another line of repercussions, can he work through the soil bank program's effects on prices for agricultural products in foreign markets and consequent implications for foreign relations, including those arising out of economic rivalry between the United States and the U.S.S.R.

In the method of successive limited comparisons, simplification is systematically achieved in two principal ways. First, it is achieved through limitation of policy comparisons to those policies that differ in relatively small degree from policies presently in effect. Such a limitation immediately reduces the number of alternatives to be investigated and also drastically simplifies the character of the investigation of each. For it is not necessary to undertake fundamental inquiry into an alternative and its consequences; it is necessary only to study those respects in which the proposed alternative and its consequences differ from the status quo. The empirical comparison of marginal differences among alternative policies that differ only marginally is, of course, a counterpart to the incremental or marginal comparison of values discussed above.[6]

Relevance as Well as Realism

It is a matter of common observation that in Western democracies public administrators and policy analysts in general do largely limit their analyses to incremental or marginal differences in policies that are chosen to differ only incrementally. They do not do so, however, solely because they desperately need some way to simplify their problems; they also do so in order to be relevant. Democracies change their policies almost entirely through incremental adjustments. Policy does not move in leaps and bounds.

The incremental character of political change in the United States has often been remarked. The two major political parties agree on fundamentals; they offer alternative policies to the voters only on relatively small points of difference. Both parties favor full employment, but they define it somewhat differently; both favor the development of

[6] A more precise definition of incremental policies and a discussion of whether a change that appears "small" to one observer might be seen differently by another is to be found in my "Policy Analysis," 48 *American Economic Review* 298 (June, 1958).

water power resources, but in slightly different ways; and both favor unemployment compensation, but not the same level of benefits. Similarly, shifts of policy within a party take place largely through a series of relatively small changes, as can be seen in their only gradual acceptance of the idea of governmental responsibility for support of the unemployed, a change in party positions beginning in the early 30's and culminating in a sense in the Employment Act of 1946.

Party behavior is in turn rooted in public attitudes, and political theorists cannot conceive of democracy's surviving in the United States in the absence of fundamental agreement on potentially disruptive issues, with consequent limitation of policy debates to relatively small differences in policy.

Since the policies ignored by the administrator are politically impossible and so irrelevant, the simplification of analysis achieved by concentrating on policies that differ only incrementally is not a capricious kind of simplification. In addition, it can be argued that, given the limits on knowledge within which policy-makers are confined, simplifying by limiting the focus to small variations from present policy makes the most of available knowledge. Because policies being considered are like present and past policies, the administrator can obtain information and claim some insight. Non-incremental policy proposals are therefore typically not only politically irrelevant but also unpredictable in their consequences.

The second method of simplification of analysis is the practice of ignoring important possible consequences of possible policies, as well as the values attached to the neglected consequences. If this appears to disclose a shocking shortcoming of successive limited comparisons, it can be replied that, even if the exclusions are random, policies may nevertheless be more intelligently formulated than through futile attempts to achieve a comprehensiveness beyond human capacity. Actually, however, the exclusions, seeming arbitrary or random from one point of view, need be neither.

Achieving a Degree of Comprehensiveness

Suppose that each value neglected by one policy-making agency were a major concern of at least one other agency. In that case, a helpful division of labor would be achieved, and no agency need find its task beyond its capacities. The shortcomings of such a system would be that one agency might destroy a value either before another agency could be activated to safeguard it or in spite of another agency's efforts. But the possibility that important values may be lost is present in any form of organization, even where agencies attempt to comprehend in planning more than is humanly possible.

The virtue of such a hypothetical division of labor is that every important interest or value has its watchdog. And these watchdogs can protect the interests in their jurisdiction in two quite different ways: first, by redressing damages done by other agencies; and, second, by anticipating and heading off injury before it occurs.

In a society like that of the United States in which individuals are free to combine to pursue almost any possible common interest they might have and in which government agencies are sensitive to the pressures of these groups, the system described is approximated. Almost every interest has its watchdog. Without claiming that every interest has a sufficiently powerful watchdog, it can be argued that our system often can assure a more comprehensive regard for the values of the whole society than any attempt at intellectual comprehensiveness.

In the United States, for example, no part of government attempts a comprehensive overview of policy on income distribution. A policy nevertheless evolves, and one responding to a wide variety of interests. A process of mutual adjustment among farm groups, labor unions, municipalities and school boards, tax authorities, and government agencies with responsibilities in the fields of housing, health, highways, national parks, fire, and police accomplishes a distribution of income in which particular income problems neglected at one point in the decision processes become central at another point.

Mutual adjustment is more pervasive than the explicit forms it takes in negotiation between groups; it persists through the mutual impacts of groups upon each other even where they are not in communication. For all the imperfections and latent dangers in this ubiquitous process of mutual adjustment, it will often accomplish an adaptation of pol-

icies to a wider range of interests than could be done by one group centrally.

Note, too, how the incremental pattern of policy-making fits with the multiple pressure pattern. For when decisions are only incremental—closely related to known policies, it is easier for one group to anticipate the kind of moves another might make and easier too for it to make correction for injury already accomplished.[7]

Even partisanship and narrowness, to use pejorative terms, will sometimes be assets to rational decision-making, for they can doubly insure that what one agency neglects, another will not; they specialize personnel to distinct points of view. The claim is valid that effective rational coordination of the federal administration, if possible to achieve at all, would require an agreed set of values[8]—if "rational" is defined as the practice of the root method of decision-making. But a high degree of administrative coordination occurs as each agency adjusts its policies to the concerns of the other agencies in the process of fragmented decision-making I have just described.

For all the apparent shortcomings of the incremental approach to policy alternatives with its arbitrary exclusion coupled with fragmentation, when compared to the root method, the branch method often looks far superior. In the root method, the inevitable exclusion of factors is accidental, unsystematic, and not defensible by any argument so far developed, while in the branch method the exclusions are deliberate, systematic, and defensible. Ideally, of course, the root method does not exclude; in practice it must.

Nor does the branch method necessarily neglect long-run considerations and objectives. It is clear that important values must be omitted in considering policy, and sometimes the only way long-run objectives can be given adequate attention is through the neglect of short-run considerations. But the values omitted can be either long-run or short-run.

[7] The link between the practice of the method of successive limited comparisons and mutual adjustment of interests in a highly fragmented decision-making process adds a new facet to pluralist theories of government and administration.

[8] Herbert Simon, Donald W. Smithburg, and Victor A. Thompson, *Public Administration* (Alfred A. Knopf, 1950), p. 434.

Succession of Comparisons (5b)

The final distinctive element in the branch method is that the comparisons, together with the policy choice, proceed in a chronological series. Policy is not made once and for all; it is made and re-made endlessly. Policy-making is a process of successive approximation to some desired objectives in which what is desired itself continues to change under reconsideration.

Making policy is at best a very rough process. Neither social scientists, nor politicians, nor public administrators yet know enough about the social world to avoid repeated error in predicting the consequences of policy moves. A wise policy-maker consequently expects that his policies will achieve only part of what he hopes and at the same time will produce unanticipated consequences he would have preferred to avoid. If he proceeds through a *succession* of incremental changes, he avoids serious lasting mistakes in several ways.

In the first place, past sequences of policy steps have given him knowledge about the probable consequences of further similar steps. Second, he need not attempt big jumps toward his goals that would require predictions beyond his or anyone else's knowledge, because he never expects his policy to be a final resolution of a problem. His decision is only one step, one that if successful can quickly be followed by another. Third, he is in effect able to test his previous predictions as he moves on to each further step. Lastly, he often can remedy a past error fairly quickly—more quickly than if policy proceeded through more distinct steps widely spaced in time.

Compare this comparative analysis of incremental changes with the aspiration to employ theory in the root method. Man cannot think without classifying, without subsuming one experience under a more general category of experiences. The attempt to push categorization as far as possible and to find general propositions which can be applied to specific situations is what I refer to with the word "theory." Where root analysis often leans heavily on theory in this sense, the branch method does not.

The assumption of root analysts is that theory is the most systematic and economical way to bring relevant knowledge to bear on a

specific problem. Granting the assumption, an unhappy fact is that we do not have adequate theory to apply to problems in any policy area, although theory is more adequate in some areas—monetary policy, for example—than in others. Comparative analysis, as in the branch method, is sometimes a systematic alternative to theory.

Suppose an administrator must choose among a small group of policies that differ only incrementally from each other and from present policy. He might aspire to "understand" each of the alternatives—for example, to know all the consequences of each aspect of each policy. If so, he would indeed require theory. In fact, however, he would usually decide that, *for policy-making purposes,* he need know, as explained above, only the consequences of each of those aspects of the policies in which they differed from one another. For this much more modest aspiration, he requires no theory (although it might be helpful, if available), for he can proceed to isolate probable differences by examing the differences in consequences associated with past differences in policies, a feasible program because he can take his observations from a long sequence of incremental changes.

For example, without a more comprehensive social theory about juvenile delinquency than scholars have yet produced, one cannot possibly understand the ways in which a variety of public policies—say on education, housing, recreation, employment, race relations, and policing—might encourage or discourage delinquency. And one needs such an understanding if he undertakes the comprehensive overview of the problem prescribed in the models of the root method. If, however, one merely wants to mobilize knowledge sufficient to assist in a choice among a small group of similar policies—alternative policies on juvenile court procedures, for example—he can do so by comparative analysis of the results of similar past policy moves.

Theorists and Practitioners

This difference explains—in some cases at least—why the administrator often feels that the outside expert or academic problem-solver is sometimes not helpful and why they in turn often urge more theory on him. And it explains why an administrator often feels more confident when "flying by the seat of his pants" than when following the advice of theorists. Theorists often ask the administrator to go the long way round to the solution of his problems, in effect ask him to follow the best canons of the scientific method, when the administrator knows that the best available theory will work less well than more modest incremental comparisons. Theorists do not realize that the administrator is often in fact practicing a systematic method. It would be foolish to push this explanation too far, for sometimes practical decision-makers are pursuing neither a theoretical approach nor successive comparisons, nor any other systematic method.

It may be worth emphasizing that theory is sometimes of extremely limited helpfulness in policy-making for at least two rather different reasons. It is greedy for facts; it can be constructed only through a great collection of observations. And it is typically insufficiently precise for application to a policy process that moves through small changes. In contrast, the comparative method both economizes on the need for facts and directs the analyst's attention to just those facts that are relevant to the fine choices faced by the decision-maker.

With respect to precision of theory, economic theory serves as an example. It predicts that an economy without money or prices would in certain specified ways misallocate resources, but this finding pertains to an alternative far removed from the kind of policies on which administrators need help. On the other hand, it is not precise enough to predict the consequences of policies restricting business mergers, and this is the kind of issue on which the administrators need help. Only in relatively restricted areas does economic theory achieve sufficient precision to go far in resolving policy questions; its helpfulness in policy-making is always so limited that it requires supplementation through comparative analysis.

Successive Comparison as a System

Successive limited comparisons is, then, indeed a method or system; it is not a failure of method for which administrators ought to apologize. None the less, its imperfections, which have not been explored in this paper, are many. For example, the method is without a built-in safeguard for all relevant values, and it also may lead the decision-maker to

overlook excellent policies for no other reason than that they are not suggested by the chain of successive policy steps leading up to the present. Hence, it ought to be said that under this method, as well as under some of the most sophisticated variants of the root method—operations research, for example—policies will continue to be as foolish as they are wise.

Why then bother to describe the method in all the above detail? Because it is in fact a common method of policy formulation, and is, for complex problems, the principal reliance of administrators as well as of other policy analysts.[9] And because it will be superior to any other decision-making method available for complex problems in many circumstances, certainly superior to a futile attempt at superhuman comprehensiveness. The reaction of the public administrator to the exposition of method doubtless will be less a discovery of a new method than a better acquaintance with an old. But by becoming more conscious of their practice of this method, administrators might practice it with more skill and know when to extend or constrict its use. (That they sometimes practice it effectively and sometimes not may explain the extremes of opinion on "muddling through," which is both praised as a highly sophisticated form of problem-solving and denounced as no method at all. For I suspect that in so far as there is a system in what is known as "muddling through," this method is it.)

One of the noteworthy incidental consequences of clarification of the method is the light it throws on the suspicion an administrator sometimes entertains that a consultant or adviser is not speaking relevantly and responsibly when in fact by all ordinary objective evidence he is. The trouble lies in the fact that most of us approach policy problems within a framework given by our view of a chain of successive policy choices made up to the present. One's thinking about appropriate policies with respect, say, to urban traffic control is greatly influenced by one's knowledge of the incremental steps taken up to the present. An administrator enjoys an intimate knowledge of his past sequences that "outsiders" do not share, and his thinking and that of the "outsider" will consequently be different in ways that may puzzle both. Both may appear to be talking intelligently, yet each may find the other unsatisfactory. The relevance of the policy chain of succession is even more clear when an American tries to discuss, say, antitrust policy with a Swiss, for the chains of policy in the two countries are strikingly different and the two individuals consequently have organized their knowledge in quite different ways.

If this phenomenon is a barrier to communication, an understanding of it promises an enrichment of intellectual interaction in policy formulation. Once the source of difference is understood, it will sometimes be stimulating for an administrator to seek out a policy analyst whose recent experience is with a policy chain different from his own.

This raises again a question only briefly discussed above on the merits of like-mindedness among government administrators. While much of organization theory argues the virtues of common values and agreed organizational objectives, for complex problems in which the root method is inapplicable, agencies will want among their own personnel two types of diversification: administrators whose thinking is organized by reference to policy chains other than those familiar to most members of the organization and, even more commonly, administrators whose professional or personal values or interests create diversity of view (perhaps coming from different specialties, social classes, geographical areas) so that, even within a single agency, decision-making can be fragmented and parts of the agency can serve as watchdogs for other parts.

[9] Elsewhere I have explored this same method of policy formulation as practiced by academic analysts of policy ("Policy Analysis," 48 *American Economic Review* 298 [June, 1958]). Although it has been here presented as a method for public administrators, it is no less necessary to analysts more removed from immediate policy questions, despite their tendencies to describe their own analytical efforts as though they were the rational-comprehensive method with an especially heavy use of theory. Similarly, this same method is inevitably resorted to in personal problem-solving, where means and ends are sometimes impossible to separate, where aspirations or objectives undergo constant development, and where drastic simplification of the complexity of the real world is urgent if problems are to be solved in the time that can be given to them. To an economist accustomed to dealing with the marginal or incremental concept in market processes, the central idea in the method is that both evaluation and empirical analysis are incremental. Accordingly I have referred to the method elsewhere as "the incremental method."