

SYSTEMS ANALYSIS AND THE POLITICAL PROCESS

James R. Schlesinger

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The RAND Corporation, Santa Monica, California

My purpose in this paper is to evaluate the role for systems analysis -- particularly as it functions in a highly politicized environment. I shall not devote any attention to discussing whether cost effectiveness procedures are hypothetically desirable. Far too much attention -- in Congress and elsewhere -- has been wasted in this strange dialectical tilting ground. Viewed abstractly, systems analysis implies rigorous thinking, hopefully quantitative, regarding the gains and the resource-expenditures involved in a particular course of action -- to insure that scarce resources are employed productively rather than wastefully. It is almost tautological therefore to state that systems analysis effectively employed will be beneficial. The real questions arise when we descend from a high-level of abstraction and begin to grapple with the practical issues. Attention must be given to such questions as (1) the quality of information bases and analyses, (2) methodology, (3) bias, (4) the impact of politicized environments on analytical efforts and analytical results.

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These issues cannot be treated wholly in isolation. The quality of information, for example, is very much influenced (and biased) by the structure of and alliances within the bureaucracy. The methodology chosen for analytical efforts will in itself introduce a specific form of bias. These in turn, reinforced by the specific interests and functions of separate sections of the bureaucracy, will increase tensions within the Government and make more costly the introduction of changes which might objectively be regarded as desirable. Nonetheless, the effort to sort out different classes of issues must be made. One may categorize issues (1) and (2) as "mechanical" and issues (3) and (4) as "organizational." Without implying a judgment regarding the relative importance of these problems, it is plain that a paper directed to political scientists should concentrate on the latter class of problems. After a few words on the way in which the data base and methodology may influence the quality of analysis, the balance of the paper will be devoted to the implications of these broader organizational issues.

Where gross wastage and irrationality have flourished it is relatively easy (in principle) to indicate very improved patterns of resource allocation even in the face of rather skimpy data. In all other cases the quality of the underlying data will determine the quality of analysis. The fact must be recognized that the data presently available to the Government for analytical work are not in good shape. One of the reasons for the success of systems analysis in the DoD under McNamara is that considerable prior effort had been invested in the development and study of the data relevant to defense problems. For most of its other functions the Government faces an uphill fight simply in developing useful data.

In part, this problem will yield to steady effort especially as more trained personnel become available. However, it would be utopian to expect agencies automatically to provide data useful for analytical purposes. Knowledge is a form of power, and most institutions exhibit an understandable reluctance to dissipate this power in the absence of compensating advantages. While newer or favored agencies, which anticipate expanded budgets, are likely to prove cooperative, the old-line agencies, especially those that have established a degree of independence, are likely to prove obdurate. In many cases data of appropriate quality can only be obtained through the wholehearted cooperation of the relevant agencies. Since the indicated tactic for many agencies will be to hide some information and to release much of the balance in warped form, many decisions will continue to be based on deficient information with only limited confidence being placed in the results.

The problems that established methodology can create ought not be ignored, even though a sense of proportion suggests that in relation to the enormous potential payoff of systems analysis the errors attributable to methodological bias should be relatively small. While at its best systems analysis insists only on "rigorous thinking," the background of systems analysis in lower-order operations research problems has resulted in a lingering preference for formal models, preferably mathematical. In numerous cases this leads to the neglect of important variables which are not readily subject to manipulation to the existing methods. The normal association of model-building and simplification cannot be avoided in analytical work in the social sciences, but there is cause for concern if such analytical work becomes the sole basis for decisionmaking. The

stress on quantifiable elements is particularly risky in cost-benefit work where objectives are hard to define or subject to change. In most cases the cost elements can be reduced to money terms. By contrast, objectives may be numerous, mutually incommensurable, and reducible to money terms only on the basis of rather arbitrary and subjective judgments by the analyst.* The result is that what started as a cost-benefit analysis becomes primarily a crude cost comparison -- with inadequate attention either to a number of the potential benefits or to the adaptability of the preferred alternative to a number of unforeseen contingencies. Countervailing tendencies toward prodigality in pursuit of misconceived or ill-defined objectives may bulk larger overall, yet there is no assurance that such tendencies will serve as direct offsets to the biasing of specific analyses toward the choice of the low-cost alternative. When and if systems-analytical work becomes routinized, the risks implicit in methodological bias will rise.

As distinct from methodological bias, the more general forms of bias reflect the pressures of a large and variegated organizational structure. Among the causes of bias are: asymmetry in the sources of information, disproportionate attention by the analyst to preferred information sources, prior intellectual commitment on the part of the analyst, selectivity in organizational recruitment, and other bureaucratic pressures. From these sources a great deal of bias, reinforced by slipshod and mechanical work, inevitably slips in, even on those

*It is infeasible to go into the criterion problem at any length. Suffice it to say that for most higher-order problems adequate measures of merit have yet to be devised. Even if some improvement may be hoped for, the irreducibly subjective element in such measures will remain substantial.

occasions that it is not deliberately introduced. It scarcely needs saying that in so complex an organization as the United States Government, viewed from its highest levels, that deliberate introduction of misinformation and distortion is no insignificant problem in itself, as will be seen below. The point being made here is that a very large proportion of total bias springs from honest conviction rather than the attempt to deceive, and it is particularly difficult to compensate for bias in this form. Contrary to a widespread hope the solution does not lie in the training and upgrading of personnel -- in getting more honest (or more intelligent and capable) personnel. The most damaging forms of bias spring from an honest, if misguided, conviction of the correctness of one's own views. Where biases clash they may be viewed with less apprehension under the classification of the "competition of ideas." But all too frequently biases are mutually reinforcing. And, in any event, the introduction of bias (inevitable in all save the lowest-order decisions) contaminates the detached and quantitative analysis which a widespread myth holds to be attainable.

The final question bearing on the effectiveness of systems analysis for governmental decision-making is the impact of politicized environments on analytical efforts and analytical results. The deliberate introduction of distortion and fuzziness to improve the competitive position of one's own agency or division is an unavoidable and dominant feature of the Bureaucratic landscape. At lower levels the tendency to pick and choose those data which support one's position result in analyses which may be uncritically accepted at higher levels, if the conclusions are palatable. Only if the conclusions are unpalatable,

will searching questions be raised regarding the underlying data. Not infrequently, the very agencies whose premises are most questionable, are the very ones which are most adept in handling the new quantitative tools, and in developing a superficially convincing presentation that may beguile those charged with responsibility for review.

The techniques of deception are legion; the effectiveness of intelligence operations and the available sanctions frequently low. In the variegated structure of the Government (with innumerable agencies and sub-agencies), deliberate distortion is reinforced by honest conviction, bias, recruitment, limited information, and the structure of power. It becomes impossible to separate one such element from another. In a perpetual rutting season, these mutually-reinforcing tendencies coagulate in their separate sectors of the lattice structure of the Government. How much systems analysis can do to counteract the pernicious results of such coagulative tendencies remains an open question. Certainly it can accomplish something -- hopefully a great deal. Nonetheless, the resistences to the application of systematic and rigorous analysis in a highly politicized environment are sufficient to make even the stoutest heart grow faint. Our purpose is to examine how analytical techniques will fare in this political environment. Let us consider four aspects of the problem: (1) the general limitations, (2) the relevancy of experience in the Department of Defense, (3) bureaucratic problems in a wider compass, and (4) what systems analysis can accomplish.

I. GENERAL LIMITATIONS

With perhaps a tinge of self-satisfaction on the part of its practitioners, systems analysis has been advertised as the application of logical thinking to broad policy issues. The implication is that logic comes in only one guise. Yet, whatever the doubts of those who seek to rationalize politics, the political process is dominated by a species of logic of its own, one that diverges from the brand germane to systems analysis. The domain of politics is a far broader system than that to which systems analysis is typically applied. Systems analysis applies to substantive issues susceptible to definition, where linkages exist among costs, technologies, and closely-related payoffs. The criterion is some substantive (and presumably measurable) utility which is more-or-less directly relevant to the enhancing of national security or citizen well-being. The pride of systems analysis is its ability to take a long run view and to disregard prior commitments, if they are too costly or non-productive.

By contrast, in politics one is concerned with more than the substantive costs and benefits involved in a specific decision area. One is engaged in mobilizing support by words and by actions over a wide range of ill-defined issues. The ultimate criterion will remain the psychological and voting responses of the general electorate and of important pressure groups. Positive responses in this realm are only irregularly correlated with those actions preferred on the basis of cost-benefit criteria. The focus of political action tends to be short run. The wariness with which the approaching election is watched is tempered only by the precept that the half life of the public's memory is approximately three months.

Put quite briefly, political decision operates under the normal constraint to avoid serious risk of the loss of power. The tool of politics (which frequently becomes its objective) is to extract resources from the general taxpayer with minimum offense and to distribute the proceeds among innumerable claimants in such a way as to maximize support at the polls. Politics, so far as mobilizing support is concerned, represents the art of calculated cheating -- or more precisely how to cheat without being really caught. Slogans and catch phrases, even when unbacked by the commitment of resources, remain effective instruments of political gain. One needs a steady flow of attention-grabbing cues, and it is of lesser moment whether the indicated castles in Spain ever materialize. The contrast to the systems-analytic approach with its emphasis on careful calculation of resources required to implement real alternatives could not be greater. In political decision, the appearance of effort, however inadequate, may be overwhelmingly more remunerative than the costly (and thereby unpleasant) implementation of complete programs.

Consider two of the guiding principles of systems analysis: (1) the avoidance of foot-in-the-door techniques leading to an unintended commitment to large expenditures, and (2) the orientation of analysis and allocation decisions toward output rather than input categories. These go to the heart of systems analysis with respect to the quest for the proper relating of resources provided and goals adopted. Output-orientation is designed to measure the extent to which adopted goals are actually achieved. Avoidance of foot-in-the-door is designed to prevent the preliminary wastage of resources on purposes

for which one is unwilling to pay full costs. These are laudable principles, but they conform poorly to the realities of political decision.

Politics, it was hinted above, requires the systematic exploitation of foot-in-the-door techniques. One wishes to attract current support from various voting groups by indications or symbolic representations that the government will satisfy their aspirations. One wishes to attract the support of many groups, but there are limits to the size of the budget. Consequently, resources are applied thinly over a wide array of programs. The symbolism of concern is enough and the last thing that is desired is the toting up of the full costs of a program with the implication that one should not go ahead unless willing to incur the costs involved.

Similarly, in the real world of political decision it is immensely difficult to concentrate on outputs rather than inputs. A very large proportion of political pressure is concerned with the sale of preservation of specific types of socio-economic inputs. The preservation or expansion of vested interests implies that political decision will be much concerned by and may be overwhelmed by inputs rather than outputs. No doubt, the behavior of politicians reflects a total disregard of Kant's categorical imperative, but that viewed realistically is the name of the game. Classical liberals may stress the desirability of advancing one's component of the general interests rather than one's special interests, but it requires no great amount of shrewdness on the part of politicians to see that such behavior will not lead to political success. The systems analyst may search for new and more

efficient means for achieving objectives, but these new means are by definition likely to have little political support both within and without government, depending on the affected groups. Both within and without the government (depending on the locus of affected interests) the opposition to new methods will be powerful. Consequently political leaders who are interested in maintaining a consensus (as all political leaders must be) must continue to pay close attention to input-oriented interest groups.

As a result, there is an inevitable note of paradox when systems-analytic techniques are endorsed at the highest political level. For such an endorsement implies, in principle, the partial renunciation of the most effective tools of the politician. That systems-analytic techniques are being diffused throughout the Federal bureaucracy in response to a directive^{*} of President Johnson is both understandable and ironical. It is understandable in that the pressures for sensible use of resources will be most keenly felt during an administration with high aspirations and expanding programs (much more so than, for instance, in the Eisenhower administration). Yet, it is also ironical in that no recent administration has been more alert to the direct political implications of domestic programs. Lyndon Johnson prides himself on the widespread recognition of his superb political instincts -- and on his understanding of what makes the electorate click. Repeatedly he has extracted political gain through the announcement (during the low-cost initial stages) of new programs -- before the costs have been

* For details see Bulletin No. 66-3, issued by the Bureau of the Budget on October 12, 1965.

thought through or the bills presented for payment. Though this be the political replica of what the analyst decries as foot-in-the-door techniques, few political leaders will be restrained by such an observation. Politics is geared to the hopes of the voters rather than to the calculation of the cost accountant. In politics one is almost driven to overstate the benefits and understate the costs of controversial programs.

The keynote of the Great Society has been the launching of new programs associated with substantial increases in government expenditures. Goals have been announced (like the elimination of poverty) before the means of achieving them have been developed. Neither alternative policies nor the costs have been studied until after a decision has been reached. No one would suggest that such programs as "demonstration cities"* or rent subsidies have been carefully analyzed with respect to benefits in cost, especially in relation to the alternative employment of the same resources. My point here is neither to ascribe praise or blame to what is effective politics, nor is it to raise questions regarding the merits of the programs themselves. Rather it is

*"Doing more for the cities" has become the latest arena for political competition. The new programs are to be superimposed on the old without too much study. Indicative of the pre-existing casualness in the attitude toward costing (one of the two legs of cost-benefit analysis) are two recent items bearing on the Federal Government's urban programs. First, in testifying on New York City's budgetary problems, Mayor Lindsey was unable to indicate "what is the total Federal figure?" (Senator Kennedy's words) -- in assistance to the City. No one was able to establish whether Federal contributions were closer to the half billion dollar mark or the billion dollar mark. Second, Senator Abraham Ribicoff, whose subcommittee is investigating the problem, stated in an interview: "No one really knows how much we are spending on the program to help cities.... What are these programs doing? What should they be doing? Have the cities the men to spend this money properly? What have they duplicated, what have they wasted?"

to suggest the inherent difficulties of reconciling such procedures with the precepts of systems analysis.

These problems are not new ones. For generations men have sought methods for introducing more "rationality" into the government allocations. Systems analysis is a powerful technique, but like all techniques, it will be germane only when there is a willingness to employ it systematically in dealing with issues of public policy. In fact, systems analysis is only the latest in a series of attempts to achieve more rational allocation. Moreover, prior attempts bear at least a family resemblance to what we now propose to do with systems analysis. For example, Public Law 801, passed in 1956, required the presentation of five-year cost estimates when new programs were adopted. The five-year cost estimates have a familiar ring, but the law is a dead letter. It has been ignored, not because it is undesirable, but because it expresses a pious hope but disregards the underlying realities of political life. Once again it suggests the barriers of imposing upon political decision a method for efficiently using resources to provide direct, substantive benefits.

There is an old yarn which concerns a farmer who was approached by an enthusiastic extension agent pushing a new technique which allegedly would raise the farmer's output by 10 percent. The farmer is supposed to have replied: "I'm only farming half as well as I know how to, right now." It was just too much bother to take advantage of opportunities for improvement. There is a moral in the story for the improvement of the operation of the Government. In many, perhaps most, lines of activity, we already know -- even without systems analysis --

how to improve efficiency and shave costs by eliminating obsolescent activities. In principle, we could easily do far better. The problem is not absence of knowledge; it is rather that appropriate actions are constrained by political factors reflecting the anticipated reactions of various interest groups. In such lines of activity, if analysis is to be useful, it will not be by contributing to knowledge, but rather by serving as a political instrument through which the relevant political constraints can be relaxed. This is both a more modest and a more ambitious objective for systems analysis than is generally stated, but it is suggestive of the true role that analysis can play once we recognize the serious limitations imposed upon it by the political process.

II. THE RELEVANCY OF DOD EXPERIENCE

The application of cost-effectiveness techniques in the Department of Defense since 1961 is regarded as a model for reform. While unspoken, there exists an underlying premise that "what's good for the DoD, is good for the rest of the government bureaucracy." While this is, of course, true with regard to the role of analytical probing, it is not necessarily the case with regard to the implementation of analytical results. It is necessary, therefore, to explore certain differences between the Department of Defense and other elements of the bureaucracy. Moreover, we should examine the actual workings of the new procedures in the DoD, for a somewhat idealized picture has been disseminated which diverges in part from the reality. In so doing we shall be stressing the structural and political aspects of decisionmaking rather than the substantive issues that have been a controversy since 1961. In a sense, this represents an injustice to Secretary McNamara and his aides for omitting reference to the substantive issues ignores the truly remarkable way in which the new team took hold with respect to the main strategic and postural issues in 1961.

Controversies regarding budgetary allocations in defense are fought out within a single Department. Outsiders, even the Congress itself, have only a nominal influence on allocation. Since the Defense Reorganization Act of 1958, the Secretary of Defense has had sufficient authority to impose his will on the Services. Moreover, the DoD does not supply final goods and services highly valued by influential portions of the electorate, nor is its use of specific inputs such that affected

interest groups are normally in a position to block specific allocative decisions. In the United States the military has a relatively weak political position. In the absence of influential public support the traditional tactic of cultivating Congress is inadequate. When the Executive Branch stands firm behind its budgetary decisions (whether based on sound analysis or not), the military has no real alternative to accepting the decision.* The means of direct resistance, available to other components of the bureaucracy, are largely denied to the military.

Consequently the Department of Defense, relative to other components of the bureaucracy, has provided an abnormally easy place to apply program budgeting and systems analysis. Only in the case of the closing of the obsolete or redundant bases were vested interests sufficiently involved requiring major political courage to override. With the support of the President the Department of Defense can follow internally-generated guidelines, rational or otherwise, with only ineffectual resistance from below or outside. Moreover, the bulk of Defense's allocative decisions are internal to the Department. The linkages to allocative decisions by other Departments or Agencies are relatively weak, by contrast to the major civilian programs.

For those civilian programs in which improved-performance-through-analysis is hoped for, the situation is far less favorable. A number

*While this judgment conflicts sharply with the interpretation represented by General Eisenhower's "military-industrial complex" or C. Wright Mill's "power elite" -- to say nothing of the standard Leninist view, I believe that the evidence will bear out that only in periods of national hysteria does the "complex" have much influence on broad defense allocations. One need inquire only into what has happened to the Strategic Air Command under McNamara, and compare the results with the many long-lived and obsolete civilian programs.

of the newer Departments represent a gathering-in of pre-existing entities with the tradition of independence and outside sources of support serving to sustain that independence. The Secretary is in a weak position to impose decisions; he is rather like a weak feudal overlord attempting to control some ill-governed baronies. The equivalent of the Defense Reorganization Act of 1958 does not exist to establish the authority of the Secretary. This condition applies, moreover, to some of the older Departments in which nominally subordinate units are in reality independent baronies.

The services provided by the various bureaus and agencies regularly create clienteles within the electorate, whose interests it is politically risky for the President to override in preparing his Budget. These interests are strongly represented in Congress, and even a bold President could not afford to take on too many of them within a brief span of time.

The weakness of the Departments, relative to the DoD, implies that allocative decisions cannot be based upon internally-generated guidelines. Consequently guidelines must be imposed from above, which is both difficult and politically risky for the President and his principal aides. More important, the appropriate analytical and decisionmaking domain is much broader than the individual bureaus and agencies in question. There are important linkages and spillovers in costs, in technologies, and particularly in payoffs across agency lines. The improvements to be obtained by intra-organizational changes are small relative to those obtainable by inter-organizational adjustment. This is particularly dramatic, for example, in the natural resources area. Here the Bureau

of Reclamation, the Corps of Engineers, the National Park Service, the Forestry Service, the Bureau of Land Management, and the Bureau of Mines are only the more prominent among the Federal Agencies involved (whose activities must be reconciled with such State entities as the Texas Railway Commission). Each has a position to maintain and a "suboptimizing" mission to perform, and as we shall see later, the concept of that mission is frequently based upon obsolescent views and obsolescent professional functions. Each, moreover, is involved in a symbiotic relationship with a clientele, which it partially supports and from which it gains significant political backing. The "systems" to which "analysis" should be applied are far broader than the ones which are the concern of the existing entities. Yet, the existing organizational structure makes it virtually impossible to implement the recommendations which would come from good analyses. Thus, the underlying question remains: how strong is the will and ability to achieve a modernization of the structure of the Federal Government?*

To this must be added one final point. Both intensive and extensive research had been done on the problems of defense before 1961. This body of research was available to Secretary McNamara when he began to introduce his reforms in 1961, and the reforms underlay many of the decisions regarding allocations. For most of the civilian programs, very little policy-oriented research bearing on allocative decisions has been done. In some areas the problems have not even been formulated.

*The recent refusal of the Congress to sanction the transfer of the Maritime Administration from the Department of Commerce to the new Department of Transportation is symptomatic of the broader problem of achieving a more coherent structure for Federal Government activities.

Consequently, there is no capital of pre-existing research to be milked. It may be years before adequate analyses have been performed. While in no way does this suggest that analytical effort should not be pushed, it does suggest that our expectations should not be pitched too high with respect to immediate benefits.

Let us turn briefly to consider the other relevant aspect of DoD experience: the actual workings of the evaluative procedures as opposed to the idealized model. In understanding the results we must bear in mind that analytical work is performed and decisions are reached, not by disinterested machines, but by individuals with specific views, commitments, and ambitions. The normal bureaucratic tendencies may be weakened, but will not disappear. We might anticipate the following.

- o Where centralized evaluative procedures are applied, certain proposals, towards which the reviewers are predisposed, will be subject to less rigorous scrutiny than will other proposals.
- o An administrator will have powerful incentives to preserve his own options by vigorously suppressing foot-in-the-door attempts by his subordinates, he may have a strong desire to commit his superiors or his successors to those policies that he personally favors. Moreover, there may be a weak impulse to preserve options favored by subordinates, but which he opposes.
- o Finally, while the impulse to justify the commitments or disguise the errors in judgment of subordinates may be weak, the impulse to justify policies and programs to which one's own name has become attached may be correspondingly strong. Consequently, the hope that prior commitments can be disregarded appears utopian. Over time current decisionmaking may increasingly be influenced by prior decisions.

Manifestation of such tendencies have not disappeared in the DoD since 1961. The Department's leaders have been capable men -- and their preferences quite defensible. Yet, one must examine how such

bureaucratic tendencies might influence the results, not only if the DoD's decisions were in the hands of men of lesser caliber, but also when the tendencies are exhibited in the more politicized environment affecting the civilian programs. For example, under the first heading above, contract definition procedures require the judgment that the relevant technology is in hand before signing. It is rumored that DDR&E takes a far more tolerant view of "technology in hand" when it wants a contract than when it does not. While I cannot confirm this assertion from direct observation, I would not find it surprising.*

On the second point, it is plainly desirable to suppress the attempts of subordinates to commit a Department or the Government to certain courses of action, even when this does not preclude such attempts at higher levels. The point we must keep in mind is that outside the DoD there may be a closer identification of senior officials with the proposals made by subordinate units in their Departments. There may be less ability to control and suppress attempts to gain Departmental support. In that case the willingness of senior administrators to push for commitments at higher levels would not imply a willingness to suppress such pressures from below. Consequently, the Departments could become transmission belts to move the pressure for commitments from lower units to higher political levels.

* Such an attitude of easy tolerance could be disastrous in the civilian programs. As we shall see below, certain civilian agencies take quite readily to the language of systems analysis and are able to construct superficially plausible, but basically misleading analyses. Where strong political pressures are involved, there may be no inclination to scrutinize and challenge superficially plausible analyses, and consequently costly and ineffective programs may win easy acceptance.

Enough has been said to suggest that there is some discrepancy between the theory and the practice of systems analysis. While the theory is unexceptionable, the practice is subject to the temptations and distractions that characterize the real world. Actual experience in the DoD ought not be treated as synonymous with the idealized theoretical statement of the procedures. Perfection and elegance exist but rarely in the real world. When the natural impediments to implementation, which were encountered in DoD experience, are extended to the more raucous and politicized environment of the civilian programs, we should not be too surprised if the DoD experience proves to be a rather inexact model for what will actually take place.

III. THE ENCOUNTER WITH THE BUREAUCRACY

In predicting how systems analysis will fare as it encounters the passive resistance of the bureaucracy, one might start with E. L. Katzenbach's observation in his classic study of the Horse Cavalry that "history...is studded with institutions which have managed to dodge the challenge of the obvious."^{*} The reference is to military history, but observers as diverse as Thomas Jefferson and C. Northcote Parkinson suggest that the dictum may also be relevant to the civilian bureaucracy. For the military, as Katzenbach indicates, the difficulty of serious inter-war testing of the effectiveness of forces partially accounts for the longevity of obsolescent institutions. But Katzenbach wrote prior to the impact of systems analysis, and it is arguable that the new techniques have eased the problem of testing and have made it more difficult for obsolescent institutions to withstand the challenge of the obvious. In civilian activities, however, the problem is less one of devising suitable instruments for testing than of overcoming inertia and the political strength of supporting constituencies. It is rare that the obsolescence of civilian functions becomes obvious. The dramatic evidence of an opponent's military capability is absent. The civilian agencies make contributions to the well-being of portions of the electorate, and it is difficult to make a persuasive case that the functions or technologies in question

^{*}E. L. Katzenbach, Jr., "The Horse Cavalry in the Twentieth Century: A Study in Policy Response," Public Policy, 1958, Graduate School of Public Administration, Harvard University, p. 121.

have been superseded. Perhaps only dramatic, interest-arousing events are sufficient to persuade the public that the productive period of an institution's life is near its end.*

The barriers to the effective utilization of analysis are formidable. The older agencies, anxious to preserve their traditional orientations and functions, will be reluctant to view problems in terms of "broader systems." Given the narrow perspective of most agencies, the spillovers are already large and growing. Yet, if the spillover problem is seriously attacked, it would certainly imply radical change in the well-established ways of doing business and could imply a shrinkage of budgets. By contrast, the DoD has energetically dealt with the issues of spillovers between the Services. Spillovers from the DoD to the outside are perhaps another matter, but these are relatively small -- in comparison to those existing at the relevant decision-making level in the civilian agencies.

Collectively the programs of the Government are like an iceberg with only a small portion appearing above the surface. Most of the existing arrangements continue from year to year, in a brief period only relatively minor perturbations are feasible, whereas to implement analytical conclusions may require radical modernization. Thus, the difficulties are substantial. The older agencies will resist either the imparting of information or the development of analyses which would cut into their treasure troves. Unhappily, the new agencies, from which

* Conceivably the Bureau of Reclamation's invasion of the Grand Canyon may be such an event, bringing to the attention of the public that (a) the supply of suitable dam sites in the U.S. is nearing exhaustion and (b) hydropower has in large measure been superseded in its economics by both coal-fired and nuclear plants.

better things might be hoped, are put under unremitting pressure to produce glamorous new programs -- before the necessary analysis has been performed.

These are the "obvious" obstacles, but there are others more subtle and less obvious.

First, there is the ease with which all parties may fall into describing as "end use" or as outputs what are essentially inputs. The temptation is strong to continue to describe as an output what it has always been the agency's purpose to produce. The organization of the Government for providing "outputs" has normally been on an "input" basis.* The Forestry Service produces forests; the Bureau of Reclamation builds dams; the Corps of Engineers creates canals and flood control projects; the Atomic Energy Commission is charged with the responsibility aggressively to push the development of nuclear power. What is needed is a broader view of power developments or water resources developments or land use -- with the evaluation of the relative benefits that component programs could provide on an integrated basis. But the existing organizations are in no position, either structurally or temperamentally, to provide such an evaluation. Even where an agency is organizationally charged with a broader responsibility, confusion may remain regarding just what the "output" is. The Forestry Service is charged not only to manage the forests efficiently for production purposes, but to provide

*The establishment of single-function agencies is both a reflection of and a promoter of what may be called "resource ideologies" -- in which "water," "nuclear energy," "timber," and the like become valued for their own sake and become the measure of value.

recreation for the public. However, the Forestry Service is dominated or strongly influenced by professional foresters, sometimes known as "timber beasts." Foresters certainly love trees and productive forests as such, and may view the town-dwellers who invade their forests as a nuisance to be tolerated. Consequently, the suggestion is hardly surprising that the Forest Service has overinvested in timber production and underinvested in recreation. Moreover, the Forest Service is interested in timber rather than in lumber. Yet, from the national standpoint, it is arguable that small sums invested in research and development on sawmill operations would have a much higher payoff than much larger sums invested in expanded tree production.

This leads into the second difficulty, which may be the most baffling and intractable of all. This is the orientation of research personnel in the agencies to prevailing notions of professional standards and scientific integrity. This orientation tends to overshadow a concern for the broader policy objectives of the agency. Reduced payoffs in this case reflect the highest rather than the lowest motives, but the impact on government efficiency may be the same. Researchers who respond mainly to the interests of their professional peers in universities and elsewhere may keep the research shop so pure that it is of little use to the agency in developing improved techniques or policies. This is the opposite extreme from use of research as an unimaginative and low-level tool for management, but it can occur within the same organization. A portion of the Forestry Service's research personnel are primarily concerned with maintenance of professional status among foresters located in large measure outside the Service. Perhaps a more interesting

example is the Geological Survey, which played so large a role in stimulating hydrological research in this country. In any attempt to achieve a coordinated water research program in the Government, the Geological Survey would be a key element. However, Survey personnel have been reluctant to be included in any such plan for fear that the Survey would become embroiled in policy issues and lose its identification with pure science. One is not without sympathy for such an attitude. Yet, effective policy research -- at an intermediate level high science and prosaic managerial research -- must be carried out somewhere in the Government, if the new analytical techniques are to be exploited. The reorientation and broadening of professional attitudes is an essential ingredient for the more effective performance of many governmental functions. Yet, it is a problem that is easier to indicate than to solve. At best, many years will be required before the professional bodies are appropriately reoriented.

Third, there exist certain fundamental issues of choice, which even complete modernization of the governmental structure cannot resolve. Analysis cannot bridge the gap between irreconcilable objectives. At its best, analysis can shed some light on the costs of accepting one objective at the expense of others. But there is a danger that analysis may help to disguise fundamental choice problems as efficiency problems. Analytical techniques have been most successful in obtaining efficient mixes through the compromising of several objectives. But some objectives are not susceptible to compromise, and such objectives could easily be ignored in the simply-minded quest for efficient solutions. Consider one important form of land use, that of wilderness preservation. The

now dominant approach to land use analysis is that of multiple use with utilities balanced at the margin. But, by definition, a wilderness cannot be "improved" for other purposes. The preservationist impulse is one of exclusionary use of unique ecological or geological settings. One must face the fundamental choice issue before one seeks efficiency, or the issue of choice will be prejudged. The difficulty in the extended discussions of improved managerial or analytical tools is that it distracts attention from these more fundamental questions which deserve study in depth. By establishing efficiency as a goal one is deflected from examining those positions in which the question is: how much "efficiency" should we sacrifice in order to preserve a particular style of life or physical environment?

These are examples of the less obvious obstacles in the path of improved-government-service-at-lowered-unit-cost through analysis. But enumeration of these problems should not be taken to imply that we should be deterred from pushing ahead with the development and the exploitation of analytical techniques. These problems will yield to persevering effort. In the long run, they may prove to be less of a barrier than the more obvious one embodied in the formidable powers of resistance represented by the existing organizational structure and division of labor within the government.

Without modernization of the bureaucratic structure, a large portion of the potential gains of the broad application of systems analysis will be foregone. The existing structure, organized in large measure around inputs and supported by clienteles with sizable political influence, may become adept at presenting drastically-suboptimized (input-oriented) or misleading analyses, which it is more convenient

to accept than reject. To accept the spirit of systems analysis is exceedingly hard, but to learn the language is rather easy. There is a danger that the same old programs will be presented in new costumes. In this regard our little experience is not altogether encouraging. A number of the agencies which were early users of cost-benefit techniques have demonstrated a proficiency in presenting questionable cost-benefit analyses for questionable programs. Quantitative documentation is presented in full, but with a willing audience it appears subject to easy manipulation.

One glaring example is in water resources, for there Congress early required responsible agencies to justify proposals in terms of cost-benefit calculations. But Congress displays a willingness to be persuaded, even when the calculations are only pro forma. In developing the case for the Marble Canyon dam, the Bureau of Reclamation calculated costs on the assumption that the load factor would be 80 percent. More recently, in response to certain criticism, the Bureau has indicated that the dam would be used for firming power -- and the estimated load factor has slipped to 50 percent. No one has insisted that the Bureau go back and recalculate its estimates of costs on the basis of the adjusted figure. When there is a willingness to be persuaded, fundamental changes in the data may be treated as minor perturbations.

Another example, happily more straightforward, is the case presented by the Atomic Energy Commission to keep in operation the three gaseous diffusion plants at Oak Ridge, Paducah, and Portsmouth -- which are no longer required for military production. The Commission's argument is that there will be a strain on production facilities around 1980, and

there should be "pre-production"* of slightly enriched uranium to provide for power reactors some 15 years in the future. Given any reasonable rate of discount, 5 percent for purposes of discussion, the Commission's argument says, in effect, that it will be unable 15 years hence to perform separative work at less than double the present cost. Since work is going forward on improving gaseous diffusion and other technologies; since it may be more efficient (given the pattern of demand) to scrap the present plants and build new ones at a later date; and since a main cost item in the gaseous diffusion process is the cost of electric power (which the Commission repeatedly has insisted will be reduced), it would seem that one might reasonably forecast a fall in the cost of separative work rather than an increase. Nonetheless, it would not be wise to assume that the Commission will be unsuccessful in pressing its case or that the diffusion plants will, in fact, be closed down when the existing power contracts have been terminated.

These cases may indicate the shape of things to come in the future. It should come as no great surprise that Government agencies, like other entrenched interests, will fight vigorously to preserve their activities.

*The term "stockpiling" has acquired some unfortunate connotations, and is going out of favor.

IV. WHAT CAN SYSTEMS ANALYSIS ACCOMPLISH?

The number of apprehensions that have been expressed might make it appear that I am indifferent, or even opposed, to the attempt to introduce systems analysis throughout the Government. On the contrary, I am hopeful and even, within moderation, enthusiastic. This is a case of two and a half cheers for systems analysis. But before we begin to cheer we should be fully aware of what systems analysis cannot accomplish as well as what it can.

In the first place, systems analysis cannot achieve wonders: it cannot transmute the dross of politics into the fine gold of Platonic decisionmaking, which exists in the world of ideas rather than the world of reality. Political decisions in a democratic society can hardly be more "rational" than the public, the ultimate sovereign, is willing to tolerate. All of the old elements remain: the myths and ideologies, the pressure groups, the need for accommodation and compromise, the decision made under duress. Systems analysis may modify, but it cannot extirpate these elements. Analysis is not a substitute for any form of decisionmaking, but for political decisionmaking it will be an even less effective guide than in narrower decision contexts.

As long as the public displays an insatiable appetite for "constructive new ideas" (whether or not they have been systematically designed) democratic politics will inevitably revolve around the foot-in-the-door techniques that the analysts criticize. As long as interested clienteles will support inefficient or counter-productive government activities, obsolescent functions will be preserved. Democratic

politics will remain unchanged: a combination of pie in the sky and a bird in the hand. Tokenism, catch-phrases, and cultivation of various interests will remain the guideposts.

What then can systems analysis accomplish? The question is perhaps most relevant for the long run, since we must recognize the problem of transition. The qualities that make for good analysis -- detachment, breadth, interdisciplinary sympathies -- do not appear like manna from heaven. It will take time to train an adequate supply of personnel and to produce good analysis. One cannot put new wine into old bottles. Even though the language of cost-effectiveness analysis is adopted by the agencies, one cannot expect a miraculous change of attitudes. At best, it will be years before analysis begins to have a significant influence in many agencies.

Nonetheless, even in the shorter run analysis will serve an educative function. In ways that may go unrecognized, analysis will begin to reshape the way that agencies view their own problems. While the desire to preserve empires will not disappear, the concept of the agency's functions will undergo change. Perhaps this is the major accomplishment of analysis: it sharpens and educates the judgments and intuitions of those making decisions. Even when analytical drapings are employed consciously or unconsciously as a camouflage for prejudged issues, the intuitions will have become sharper.

In the early stages, this educative function may be reinforced by the shock effect. The need to respond to probing questions will shake up many a stale mill pond. An advantage of all new techniques of managerial decisionmaking is that it forces management to think through its problems anew. In an environment so readily dominated by routine,

this cannot help but have a favorable impact.

The other major function of analysis is to smoke out the ideologies and the hidden interests. By introducing numbers, systems analysis serves to move arguments from the level of ideology or syllogism to the level of quantitative calculation. Of course, numbers alone are not necessarily persuasive. The ideologies and the established interests may not be rooted out, but the whole character of the discussion is changed. There will be a far greater awareness of how much it costs to support programs revolving about particular interests or resources. The public may be willing to pay the price -- at least temporarily -- but such a program is put on the defensive. Ideology alone will no longer suffice. In the longer run less resources are likely to be committed to the program and less will be wasted than if the cost-effectiveness calculations had not been done.

Finally, we must remember that there is a certain amount of gross wastage in the Government, which serves nobody's purpose. These situations reflect not differences of opinion, no interests, nor ideologies, but simply the failure to perceive dominant solutions. It is in this realm that McNamara achieved his great savings within the Pentagon. With the elimination of these obvious sources of waste, analyses have had to become more subtle and recondite, but they are not necessarily as productive. Sources of gross waste may have been more common and certainly easier to get at in the Services than in the civilian programs. But within the civilian programs there remains a margin which can be squeezed out -- even without the modernization of the Government's administrative structure.

