Systems analysis and the quest for rational defense

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THERE have been serious problems with U.S. defense policy and with the performance of the U.S. armed forces over the last 20 years, and on more than one occasion these problems have been blamed on the methods of analysis and ways of thinking introduced by Robert McNamara during his tenure as Secretary of Defense. His approach, it is argued, inappropriately applied what were essentially economic tools of analysis to military questions. Weapons were purchased and military organizations reformed in the pursuit of cost effectiveness, with an accompanying disregard for practical military wisdom and experience. That reduced the actual strategic effectiveness of our armed forces. What was worse, it is argued, this outlook was adopted by the officer corps itself, partly in self-defense, partly because the tools of cost-effectiveness analysis were easier to learn and apply than the more traditional approaches that drew on personal experience, military history, and other non-quantitative sources. The bluntest statement of this argument has been made by Edward Luttwak:

> . . . under the internal pressure of civilians who know not war and think that it is reducible to economics, as well as of 'demilitarized' military men who have lost sight of the essentials of their profession, our Defense Department and the armed forces themselves are not merely distracted from the large issues of strategy by the petty questions of micro-management, but

> they are in addition directed to pursue the wrong goal, namely civilian efficiency. It is not surprising to find, therefore, that the best of our forces are precisely those which are most obdurately traditional and least 'intellectual' . . . .[1]

Before we embark on new campaigns to improve our forces, it would be useful to ask what happened the last time there was an extremely vigorous effort to make the Pentagon more cost effective. Conservative folk wisdom suggests that the reform of any complex social organization is a slow business, full of the unexpected consequences of seemingly unexceptionable activities, and that reforms often appear to have more dramatic effects, either for good or for ill, than a closer examination of the facts can justify.

The early days of cost-effectiveness

Economic methods of analysis resembling those associated with the McNamara era have been a prominent part of the defense thinking of great powers at least since the introduction of large, steam-propelled warships. Each ship cost a lot of money, could be built to different designs, and, within the context of limited budgets, would use up the money that would otherwise be available to build other kinds of ships. It should come as no surprise, therefore, that we can find Winston Churchill, while chief of the British Admiralty, explicitly making some elementary cost-benefit analyses. He had in mind a picture of the kind of battle he wanted his ships to fight. He wanted the British fleet to be able to "cross the T" of the enemy fleet, so that it could bring more of its guns to bear on the target. The crucial "quantitative performance index," as the systems analysts say, was speed: If you could not overtake the enemy line of ships, you could not cut across it. Churchill therefore consciously reduced some other aspects of performance (such as the number of guns) to get more speed. Similarly, we can think of him as making decisions on what kind of "force mix" to buy, and looking to see how much money he had and how many ships of different kinds he could buy with his budget.

These kinds of decisions are not terribly different in form from some of the decisions the systems analysts brought into the Defense department in the 1960s: Quantitative measures of performance were assessed in relation to cost, in order to determine the number and kinds of forces to be procured in peacetime for possible use in war. In those decisions, interestingly enough, we also find many of

[1] Edward N. Luttwak, "Why We Need More 'Waste, Fraud, and Mismanagement' in the Pentagon," *Commentary* (February 1982).

what are now thought to be the weaknesses of systems analysis. For example, in Churchill's own description of his procurement decisions, there is no serious discussion of the factors not related to equipment performance—no discussion, for example, of the *enemy's* concept of battle, and no discussion of how crew performance, the human factor, might affect the maritime balance. But both of these factors are now thought to have played a part in the unsatisfactory outcome of the only major surface ship battle of World War I.

The influence of economists and economic methods of analysis in military decisions grew with the rise of airpower. Like battleships, bombers and fighters were costly, so that the need for trade-offs was painfully obvious. The number of planes employed in battle was sufficiently small that their performance could be studied in some detail (which was not the case with infantry battles). One result of this was the emergence of something called "operational analysis" in the years before World War II. Civilian leaders were not satisfied with British air defenses, which the Royal Air Force (RAF) had neglected as a result of its preoccupation with offensive bomber capabilities. The RAF, they felt, needed to know how to set up an air defense system that utilized radars, and they brought in scientists such as H. T. Tizard and F. A. Lindemann to assist the Air Staff. As a direct consequence of this first use of operations research, Great Britain had 20 radar stations that could detect enemy aircraft, in place and in time for the Battle of Britain. Furthermore, these radars did function as a *system* in coordinating the air battle, as a result of the operational analysis.

Operations research was really meant to answer questions about how existing forces could best be utilized. The question of which forces to procure was not part of this field of study. Instead, battles or exercises were investigated to see how weapons had actually performed, and to find out how they could be employed more effectively. Although this often involved the researchers in fairly low level, technical issues—the best way to site anti-aircraft guns, for example—the operations researchers also became involved in one of the major American decisions of the war. The question was how best to use our bombers against Nazi Germany. This involved analysis of targets, and quite quickly became the province of economists. The American Embassy in London created an "Enemy Objectives Unit" in its Economic Warfare Division, in order to develop suitable sets of targets for U.S. bombers. According to Walt Rostow, a member of the group, this unit found itself at odds in its thinking with the military men whom it was supposed to assist. Those who

had drawn up target plans before the economists arrived were men "whose careers had never required them to formulate criteria for target selection in a strategic context and to apply them systematically by comparison of alternative target sets." The new group was led by a military man, Colonel Richard D'Oyly Hughes, and by a Harvard professor of economics, Edward Mason. The staff "were, by and large, trained as economists . . . . There was something of the Austrian theory of capital and Leontieff's input-output matrix in our ways of looking at things." Rostow described the task of the group in language that would become more familiar in the 1960s: "Briefly, we sought target systems where the destruction of the minimum number of targets would have the greatest, most prompt, and most long-lasting direct military effect."[2]

These economists did not have an impact on defense procurement policies, because there was simply no time for their recommendations to have an effect on production decisions before the bomber offensive was won—the new unit was not set up until the end of 1942. They did, however, have some influence over a question that was once thought to be the sole province of military men: how the forces were used. And even at this time, economists ran into some conflict with their military superiors because of their tendency *not* to emphasize the more intangible military factors when developing plans—a criticism that would later be leveled at McNamara's systems analysts. In particular, the economists recommended deep strikes against the German-controlled oil production facilities at a time when it was important for intra-service morale that the Army Air Force be seen as doing everything in its power to support the Normandy landings. As a military man later put it, "the intellectual niceties of planning" were far from the mind of the Army commander of U.S. bombers. "If Eisenhower had asked him, in writing, to drop his bombs in the Arctic Ocean on D-Day, he would have complied."

In short, many of the characteristics of the McNamara systems analysts were present in the operational analysts working on strategic bombing in World War II. They were young economists; they had a more or less pronounced disdain for the unsystematic thinking of the military men in the same line of work as themselves, and they looked at problems economically, in terms of maximizing utility functions, somehow defined, given fixed resources. Here, then, were the original "whiz kids." Indeed, Charles Hitch, the man generally

[2] W. W. Rostow, *Pre-Invasion Bombing Strategy: General Eisenhower's Decision of March 1944* (Austin: University of Texas Press, 1981), p. 15.

regarded as the father of post-war systems analysis, was involved in the post-war analyses of bombing strategy.

The McNamara years

It is necessary to remember that the candidate John Kennedy, who would later bring NcNamara to the Pentagon, defined his defense agenda by contrasting it with Eisenhower's policies. The Democrats claimed that Eisenhower had fixed what were essentially arbitrary ceilings on the defense budget; they, by contrast, would rationally determine how much was enough, and then buy it. To facilitate rational budgeting, budgets would be structured according to functional outputs, instead of by inputs. For example, instead of showing how much money was being spent on such "artificial" categories as personnel and procurement, the budget would show how much was being spent on strategic forces, and on other functional programs. Programs and program objectives would be devised *before* budgets were set, and resources would be allocated so as to achieve program goals at the least cost. This was the now familiar Program Planning Budgeting System—PPBS. The influence of systems analysis was heightened, first by setting up a systems analysis office in the Defense department's Comptroller's office (first headed by Charles Hitch), later by creating a separate Assistant Secretary of Defense for Systems Analysis (an office first held by Alain Enthoven) in 1965. Hitch initially proposed that the analytical and budgetary mechanisms for implementing this more rational system be put in place over a period of 18 months. McNamara told Hitch to have the new system ready in six months, and Hitch complied.

In a series of lectures delivered in 1965 after he had left the government, Hitch attempted to specify the ways in which the pre-McNamara budgeting system had produced unwanted or irrational outcomes. Hitch argued that because Eisenhower's Defense department had allocated money to the services without specifying the functional goals to be pursued and without attempting any detailed monitoring of the services' programs, the

> consequences were precisely what could have been predicted. Each Service tended to exercise its own priorities, favoring its own unique missions to the detriment of joint missions, striving to lay the groundwork for an increased share of the budget in future years by concentrating on alluring new weapon systems . . . . The Air Force, for example, gave overriding priority to the strategic retaliatory bombers and missiles, starving the tactical bombers and missiles needed to support the Army ground operations . . . . The Navy gave overriding priority to its own nuclear attack

forces—notably the aircraft carriers—while its anti-submarine warfare capability was relatively neglected and its escort capability atrophied.[3]

But this statement is seriously misleading in two ways, and it reflects a profound mistrust of the services that would have unhappy consequences. To begin with, whether or not the emphasis on nuclear retaliatory forces at the expense of non-nuclear capabilities was a good idea, it was definitely not the result of service parochialism unchecked by strategic guidance. The explicit strategic doctrine of the Eisenhower years until 1958 was, it may be recalled, one of instant and massive nuclear retaliation to nuclear or non-nuclear attacks. If the Air Force built strategic bombers and fighter aircraft that were designed primarily to deliver nuclear weapons, it was in fact the result of clear guidance from the President. Likewise, the Navy's emphasis on nuclear-capable systems was also a response to the strategic doctrine of the era. Massive retaliation might not have made sense by 1960 (although what we now know about the size of the Soviet nuclear force then indicates that in the event of war, a U.S. nuclear strike might well have gone a long way toward disarming the Soviet Union). But whether or not the doctrine was sound, the rationality of the service programs, given this doctrine that they had not made, was obvious. Moreover, the "alluring new weapon systems" scorned by Hitch were, in the case of the Minuteman and the Polaris systems, the ones the Kennedy administration was proud to deploy in numbers even larger than those contemplated by Eisenhower. It is true that other systems proved to be unnecessary given the success of these two missiles, but it must be recalled that at the time of their initiation, both Minuteman and Polaris were extremely high risk projects (in the case of the Polaris, neither the propulsion system nor the guidance system nor the warhead had been proven in prototype before the decision was made to deploy the entire system). And so what may in retrospect have seemed wasteful was at the time simple prudence—having many alternative means of delivering nuclear weapons in development.

The second error in Hitch's analysis is the contention that the Eisenhower administration had simply let the services build what they wanted. For example, Arnold Kanter has analyzed the budget requests of the 1950s, to see whether the Defense department simply used budget ceilings as a blunt instrument to keep expenditures in line. He found that budget cuts were *not* allocated on the basis of

[3] Samuel A. Tucker, ed., *A Modern Design for Defense Decision: A McNamara-Hitch-Enthoven Anthology*, pre-publication edition (Washington, D.C.: Government Printing Office, 1966), pp. 68-69.

"you have X per cent of the budget, you take X per cent of the cuts." Nor was the favored service, the Air Force, immune from disproportionately large shares in the reductions made in service requests.[4] In fact, Eisenhower intervened to compel the Air Force to spend less money on bombers and more money on strategic air defenses for the continental United States. Hitch simply assumes that because the Eisenhower Defense department did not have an overt capability for intruding into the nooks and crannies of the budget, it was exerting ineffective (or non-rational) control.

Politics and PPBS

But even assuming that it is good and necessary to exert detailed control over the service budgets, we must ask whether the fabled PPBS itself was able to do this. The impressive new system was more or less in place in time for the FY 1963 budget process. It instituted the functional "output" categories that would allow decision makers, according to the theory, to see how much money they were being asked to spend on the things they really cared about, like strategic forces and air and sea lift (instead of on the meaningless "input" categories like personnel). And it involved the systems analysts, who would gather information, analyze, and put a price tag on alternative programs for the Secretary of Defense. Because the systems analysts worked for the Secretary and not the services, they would not, according to the theory, be influenced by parochial institutional interests that conflicted with the national interest. They would draw up "Draft Presidential Memoranda" for the Secretary in various issue areas; these would state what the national security goals were, what the programs that would meet the goals would be, and what, roughly, they would cost. These Memoranda would be sent to the Joint Chiefs of Staff and through them to the services, and their views, according to the theory, would be obtained and integrated in a systematic fashion. The Memoranda would be circulated long before the budget for any given fiscal year had to be finalized—according to the theory, there was to be no setting of arbitrary budget ceilings *before* program requirements had been systematically and rationally considered. In theory, it was a beautiful system. But in practice, it did not work.

The first thing that fell by the wayside was the idea that programs could be determined without regard to financial limits. It is

[4] Arnold Kanter, *Defense Politics: A Budgetary Perspective* (Chicago: University of Chicago Press, 1983), pp. 62-69.

amazing, but well documented, that McNamara said both in public and in private that "we don't build the defense program against a predetermined budget limit," and that "the recommended force structure was based on requirements for national security and was not limited by arbitrary or predetermined budget ceilings."[5] But McNamara was no more exempt from the political and financial limits of the real world than anyone else. John Crecine, for example, has pointed to the fact that Bureau of the Budget was providing fairly precise budget guidelines for the Department of Defense long *before* any Draft Presidential Memoranda could generate a "rational" recommendation.[6]

It might be thought that the consequences of making such an impossible, and even slightly silly, promise—not to be bound by arbitrary ceilings—would be minimal. But, in fact, the whole premise of the McNamara/systems analysis project was to deal with the services harshly, but rationally. The services would be asked to give up the normal political stratagems they employed to protect themselves, and, in return, they would be made part of a rational force structure that was in the nation's best interest. The reality, though, was different. In December of each year, just before the submission of the budget to Congress, McNamara's staff was forced to make the usual hasty, arbitrary budget cuts to stay within their budget ceilings, and this soon became apparent to the services. As a result, the services continued to submit their budget proposals with the same sort of protective budgetary padding they had always added. In addition, the services retained throughout the 1960s the traditional "input" line items in their own budget submissions, and did not—in fact, could not—use the "output" categories dictated by PPBS. The Army continued to buy personnel, not General Purpose Forces. The net result was that the new system had relatively little impact on the way the services looked at the budget, and, consequently, little impact on the way they planned their forces. For them, it was business as usual, plus what they regarded as the new McNamara hypocrisy.

Another area of dubious effect was in the attempt to reduce "parochial" service interests. McNamara and the analysts were certainly successful in canceling programs like the B-70, and in limiting others like the nuclear-powered aircraft carrier, which were greatly prized by the services. But they were equally capable of

[5] Kanter, *Defense Politics*, pp. 88-89; see also Alain C. Enthoven and K. Wayne Smith, *How Much Is Enough: Shaping the Defense Program 1961-1969* (New York: Harper & Row, 1972), p. 325.

[6] John P. Crecine, *Defense Budgeting: Organizational Approach to External Constraints*, RM-6121-PR (March 1970), pp. 40-42, 51.

safeguarding the parochial political interests of the Secretary of Defense and the administration that they served.

The failure of the F-111 fighter, generally considered (by critics) to be the result of analysts bent on pursuing cost-effectiveness, was actually something entirely different. From quite early on, the F-111 had serious problems. Its cost overruns, while large, were not much above the average for new aircraft of that era, but its main problems came from trying to employ too many unproven advanced technologies (swing wing, afterburning turbofan engines, advanced avionics, etc.). But as Robert Coulam has convincingly shown, the key decisions were made very early in 1961, before the systems analysts installed themselves in the Comptroller's office. The decision to go ahead with the aircraft was McNamara's, largely at the urging and with the support of the newly created office of Research and Engineering in the Pentagon.[7] The failure of the systems analysts, which came later, was their silence on the problems of an airplane closely associated with their Secretary of Defense. In addition, the systems analysts had an agreement with the Research and Engineering Office that they would not attack each other. It was not until 1968, after Robert McNamara had resigned, that the Systems Analysis Office put out its first report critical of the F-111. Until that time, they had been content to tell Congress simply that it had not been their fault.

The systems analysts also deferred to political interests during the Vietnam War. As Lyndon Johnson increased the number of troops stationed in Vietnam, the Joint Chiefs of Staff called for the mobilization of the Reserves in order to maintain the other parts of our defense—in particular, our strategic reserve. Johnson, remembering the call-up of the Reserves during the Korean War, and fearing the electoral consequences for himself if he repeated Truman's decision, told the services to find the men elsewhere. But they declined to provide him with such plans, and as Alain Enthoven proudly recalls, the Systems Analysis Office drew up the plans that provided the men for the war: The solution to that manpower problem was to take men out of units in Europe and the United States, and it helped create the "hollow Army" that we are still living with today.

This pattern—the systems analysts suspend critical judgment when the political interests of their bosses are at stake—has continued since McNamara. It is, in effect, built into the system: Without the Secretary's active support, the analysts would be isolated targets

[7] Robert F. Coulam, *Illusions of Choice: The F-111 and the Problems of Weapons Acquisition Reform* (Princeton: Princeton University Press, 1977), pp. 50-51, 108-109.

for the wrath of the services. When Leonard Sullivan became James Schlesinger's Assistant Secretary for Program Analysis and Evaluation (the new name for the Systems Analysis Office), a reporter asked him, "Do you analyze Secretary Schlesinger's own hobby horses as rigorously as you do the Services?" To which Sullivan replied, "That's a very good question. Not quite . . . . "[8]

This weakness was also apparent under Jimmy Carter. During his first three years in office, only very slow growth was programmed for the Defense budget, despite the steady growth in Soviet spending and the real declines in U.S. forces and spending during the 1970s. Russell Murray, the head of Program Analysis and Evaluation, was a better soldier for his bosses than he was an analyst. By 1982 and 1983, Murray was giving talks and publishing papers that called for defense spending increases of the size proposed by the Reagan administration, and allowed as how the studies supporting this had been completed during 1980. In fact, though, at the end of 1978 he staunchly answered the question of "how much is enough" defense spending by stating simply that the Carter administration was already spending enough on defense: "Making a better defense program at a higher budget level is child's play. Any damn fool can do that. Our objective is to demonstrate that we can, *at the same budget level*, shape a better program."[9] As one Defense department official put it, the systems analysts, by trying to put together the optimum defense program with inadequate money, were building a One Hoss Shay; it would collapse, but in a perfectly balanced way.

In all these cases, it was the political leadership of the United States that commited the basic error, not the systems analysts. Yet it was the claim of the analysts that they, unlike the military men they were displacing, "were not constrained to defer to rank, age, experience, or chain of command."[10] Their deference to manifestly poor policy decisions made that claim an empty boast.

Analyzing weapon systems

The record of the systems analysts in terms of the ultimate success or failure of programs they supported or attacked is also mixed. One of the military areas that was seemingly more amenable to the kind of quantitative analysis done by the systems analysts was that of strategic nuclear forces, in which mechanical systems and their per-

[8] Colonel R.D. Heinl Jr. (USMC Retired), *Detroit News* (August 29, 1974).

[9] Interview with Russell Murray II, by LuAnne K. Levens and Benjamin Schemmer, *Armed Forces Journal* (December, 1978): 24, emphasis added. See also *Washington Times* (January 19, 1984): 2.

[10] Enthoven and Smith, *How Much Is Enough*, p. 99.

formance played a larger role, relative to human factors, than in conventional combat. Furthermore, Kennedy's campaign alleged that the Eisenhower administration was building bombers, land-based missiles, and submarine launched missiles without any attempt to see how the three forces related to one another.

In one way, the role of systems analysis appears to have been significant in Kennedy's subsequent efforts in this area. For example, systems analysts (including Alain Enthoven) produced the famous study showing that the curve of the number of Soviets killed and the percentage of industry destroyed by nuclear missiles would begin to flatten after a given number of missiles had been deployed. This provided the public rationale for McNamara's decision to limit Minuteman deployment to 1,000 missiles. This appears to have been a clear case of the influence of systems analysis, but the real story was more complex. McNamara had also been exposed to the doctrine of damage limitation and counterforce targeting. The number of Soviets killed by us was less relevant than how many Soviet bombers and missiles we could destroy before they were launched against us. McNamara appeared initially to embrace that doctrine, and gave a public speech propounding a "no-cities" targeting doctrine at Ann Arbor in 1962. Yet as Harry Rowen and Desmond Ball have argued, the consequences of that doctrine were Air Force proposals for a war fighting force of over 2,000 ICBMs. McNamara shied away from the budgetary implications of the counterforce doctrine, and used the systems analysis of the assured destruction doctrine to justify reductions in the Air Force program.[11] Systems analysis did not so much determine force levels as serve as a political tool in Defense department budget fights.

The systems analysts do have a number of clear successes to point to. Perhaps the clearest is in the field of strategic mobility. They were the ones who championed strategic airlift in the form of the unjustly maligned C-5. More important, they advocated the pre-positioning of war materiel in Europe and on mobile logistic ships, which is now the heart of our plan to reinforce our military position in Europe or in Southwest Asia. The systems analysts have been accused of stifling innovation by forcing every proposal to justify itself with marginal performance increases that match marginal cost increases. Yet it was McNamara and the systems analysts who

[11] Desmond Ball, *Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration* (Berkeley: University of California Press, 1980), pp. 160, 200-201, 202-209, 273-274. See also Aaron Friedberg, "The Evolution of U.S. Strategic Doctrine," in Samuel Huntington, ed., *The Strategic Imperative* (Cambridge: Ballinger, 1982), pp. 70-72.

prodded a reluctant Army into the more rapid adoption of the concept of helicopter-borne airmobile troops. They recommended that the B-58, the B-70, and the SKYBOLT missile be cancelled, decisions that few people, if any, now question. They curtailed the Air Force's F-105 program and compelled the Air Force to buy the F-4, which was, in fact, better suited for the kinds of conflicts we have faced during the last 20 years than the F-105 would have been. Analysts in the Nixon administration's Program Analysis Office played a supporting role in advocating the F-16 light-weight fighter, which has been a success. The only major program decision that does not appear to have been wise was the systems analysts' opposition to the Navy's desire to equip the aircraft carrier Kennedy with a nuclear propulsion system. Even if the office was correct that the extra performance given by nuclear propulsion was not worth the extra cost (which is not clear even at this point), the years of delay incurred in getting the carrier *at all*, given the fight that the Navy and its congressional supporters were willing to make, surely outweighed any money that might have been saved. Curiously, the cost-benefit analysis behind the carrier decision had been highlighted as a classic of systems analysis in an anthology published in 1965; it is left almost unmentioned in Alain Enthoven's account of the period published in 1971.

This is not an unimpressive record, even when measured against the errors of omission and commission mentioned earlier. Yet the record of the ten years *before* the advent of systems analysis in the Defense department is at least equally impressive. The hydrogen bomb, long range ballistic missiles, a highly competent elite new arm of the Air Force (the Strategic Air Command), and nuclear-powered attack and missile-carrying submarines all were strikingly successful technical or organizational innovations. They were not created without struggles, but they were created without formal systems analysis.

After the heyday

If systems analysis did not introduce major *substantive* changes into the defense establishment, why did it have such a lasting impact on the minds of men inside and outside the government? Not least of the reasons was the high intellectual quality of the academics (largely economists and management experts) who were drawn toward government service under McNamara by the prospect of working closely with an activist Secretary of Defense. The quality of the military men who formed about one-third of the professional

staff of the Systems Analysis Office during the 1960s was also high. Stansfield Turner was an early member of the staff, for example, and by one estimate, 10 percent of the National Security Council staff members under Henry Kissinger were alumni of the Systems Analysis Office.[12] But as the importance of the office declined over time, and the special role that it had under McNamara ended, it became harder to draw the same kind of people into the office; it is now staffed by career civil servants.

This has its good and bad sides. The systems analysts made a deep impression because of their deliberate desire to make all latent disagreements over programs and operations explicit, so that they could be thrashed out, and because of their determination to tell the services that they were wrong, instead of finding less offensive ways to curtail certain military projects. This quickly created terrible civilian-military relations, including the impression among military men, as General Maxwell Taylor put it, that "either the civilian is showing dangerous overconfidence in his own military judgement or there is an incompetent military advisor."[13] Although the memory of the McNamara days still dominates people's perceptions, the character of the staff has changed. The fact that they are long-term civil servants makes them more aware of the need to get along with the services than the whiz kids were. Although Russell Murray, an engineer by training, insisted that new employees have training in the physical sciences, most of the staff in the section of the office that now reviews ground-forces policy consists of retired military officers. The institutional power of the systems analysts in the budget process has been diminished over the years in favor of the services, and it is now the services that originate the program objective memoranda that were once the province of the Program Analysis and Evaluation Office.

The intellectual impact of economic ways of thinking on the behavior of the U.S. defense establishment is harder to pin down. Eliot Cohen and others have ably analyzed the intellectual pitfalls inherent in this approach, most notably a tendency to make decisions on the basis of characteristics that can be quantified at the expense of others that cannot.[14] This potential error, which is acknowledged by systems analysts, is built into the system, and has curious consequences. One study has shown that the methods usually used by systems analysts to evaluate the combat potential of ground

[12] Benjamin Schemmer, "How Much is Enough Tells a Lot . . . But Not Enough," *Armed Forces Journal* (February 1, 1971): 41.

[13] Kanter, *Defense Politics*, p. 89.

[14] Eliot Cohen, "Guessing Game," in Huntington, ed., *The Strategic Imperative.*

forces demonstrate that Nazi Germany's invasion of France should have failed.

The real drawbacks

Service officers occasionally talk today as if they had internalized the rhetoric of systems analysis, though it is not clear whether they do so purely for public consumption, or because they genuinely think that way. But as the arguments I have presented above suggest, the major errors committed by the United States over the last 20 years—the Vietnam War, the decision not to maintain adequate defense budgets—were primarily *political* errors, made by a national leadership and then supported by the servants of the political appointees.

Still, it is useful to note three sources of error that can result from the unthinking application of economic modes of analysis to defense problems. The first is a tendency to neglect the way our enemies think about war. This is a national deficiency in the United States, and it is reinforced by systems analysis. One can read the most coherent history of systems analysis written by a systems analyst, Alain Enthoven's *How Much is Enough*, without coming across any serious discussion of how the Soviet Union looks at defense issues. What one does find is the occasional assertion that if we find a certain tactic or form of organization useful or not useful, then so will the Soviets, and the other way around. This is an assumption the pernicious consequences of which need not be belabored.

Second, there is singular failure to recognize that our military relation with our enemies, in peace and in war, is a dynamic one in which *timing* is important. One finds that certain programs have been dismissed because countermeasures to them are conceivable. But the question of how long it would take the enemy actually to develop and deploy these countermeasures is never mentioned, nor is the possibility that the enemy's organization and concept of operations might make him slow to change. That we might develop and deploy a new weapon while the enemy is reacting to our first weapon —this possibility is beyond the intellectual universe of the systems analysts, at least as it is manifested in their writings.

Finally, there is a hopeless ignorance of the actual nature of our own defense organizations. It is only a slight exaggeration to say that the dominant theme of the systems analysts is that if only our pilots did not like to fly fast airplanes so much, and if only our sailors did not like aircraft carriers so much, and if only our soldiers did not like big tanks so much, what an efficient military we would

have! It is a simple fact of life that whatever the optimal structure of our forces *might* be, we nevertheless must live with military institutions that have powerful organizational imperatives. It is rather a waste of time and effort to wish that they were not the way they are. One can try to change them slightly, over time, and try to reinforce their points of strength and slowly to curtail their less useful functions. But any successful reforms will have to be based on a sound knowledge of our military institutions as they are, not as we would wish them to be.

As to what these reforms should be, we should not expect systems analysis to give us the answer. But neither can we blame systems analysis for our failure in the last decade to make significant progress in this area. If civilians are to work intelligently and effectively with the services, the defense establishment at the highest level will first have to wrestle with a very basic question: What kind of wars do we think we will fight, and how do we plan to win them? Planning of this kind is very difficult—politically, intellectually, and psychologically—for us to perform, and the difficulty is magnified by the wide range of contingencies in which our strategic obligations may place us. But there is no alternative to serious war planning, planning that takes realistic account of our diminished strength relative to the rest of the world, of the nature of our enemy, and of the time it would take us to win any major war. Our success or failure in this endeavor, rather than the impact of systems analysis, will be the real determining factor for our future security.