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Planning

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Programming

Budgeting

Inquiry

of the

SUBCOMMITTEE ON NATIONAL SECURITY

AND INTERNATIONAL OPERATIONS

Senator Henry M. Jackson, Chairman

for the

COMMITTEE ON GOVERNMENT OPERATIONS

UNITED STATES SENATE



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S. Con. Res. 52

Agreed to March 25, 1970

Ninety-first Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the nineteenth day of January, one thousand nine hundred and seventy

Concurrent Resolution

Resolved by the Senate (the House of Representatives concurring), That there be printed for the use of the Senate Committee on Government Operations three thousand copies of a compilation of the hearings, reports, and committee prints of its Subcommittee on National Security and International Operations entitled "Planning-Programming-Budgeting," issued during the Ninetieth Congress and the first session of the Ninety-first Congress.

Attest:

FRANCIS R. VALEO,
Secretary of the Senate.

Attest:

W. PAT JENNINGS,
Clerk of the House of Representatives.
By W. RAYMOND COLLEY.

FOREWORD

In the 90th and 91st Congress (first session), the Subcommittee on National Security and International Operations conducted the first major congressional inquiry into the planning-programming-budgeting system in the national security area.

The subcommittee reviewed the application of planning-programming-budgeting in the Defense Department, the lessons of this experience, the problems encountered in applying PPB in the State Department and related agencies, and the implications of PPB for the President and the Congress.

In our study we examined the pitfalls as well as the possibilities in the use of program budgeting, systems analysis, and cost-effectiveness methods. We sought through staff reports, hearings and memoranda by eminent authorities to get the basic questions relating to these tools and management devices out on the table, to encourage, to the extent possible, sound judgment in their use.

The demand for the publications issued by the subcommittee continues to be considerable from Federal Government budget and planning officials; Civil Service Commission training institutes and other executive branch training programs; budget officers at the State and local levels who are using these materials in efforts to evaluate and improve their budgetary and analytical techniques; and from universities, colleges, and research centers at home and abroad.

The Congress has authorized the printing of a compilation of the subcommittee's planning-programming-budgeting study in the present volume. We are glad to have these materials available in this permanent form.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security and
International Operations.*

MARCH 1970.

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PLANNING-PROGRAMMING-BUDGETING

INITIAL MEMORANDUM

PREPARED BY THE
SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS
(Pursuant to S. Res. 54, 90th Cong.)
OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE



Printed for the use of the Committee on Government Operations

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FOREWORD

From the start of its work in 1959, our Senate subcommittee has had a continuing interest in the role of the budgetary process in planning and controlling national security policy. In November 1960 a subcommittee report urged President-elect Kennedy to employ the budgetary process as a key program management tool: "Budget targets should be regarded not primarily as fiscal instruments but as policy instruments." In the summer of 1961 the subcommittee held hearings on the budgetary process at which Defense officials gave the first explanation before a congressional committee of the planning, programming, and budgetary system being installed by Secretary McNamara. In October 1961 a subcommittee staff report argued:

Federal budgetmaking, in the main, has concentrated on developing information useful for day-to-day administration of the departments and agencies. Not nearly as much attention has been paid to preparing budgets in such a way as to make them most useful in establishing priorities, in forward planning, in choosing between programs, and in measuring expenditures against meaningful performance yardsticks.

On August 25, 1965, President Johnson initiated a Planning-Programming-Budgeting System (PPBS) throughout the Executive Branch, similar to that introduced into the Department of Defense in 1961. There is, therefore, a substantial experience on which to draw in considering the benefits and costs of the planning-programming-budgeting process.

The subcommittee believes that it will be useful to review the application of PPB in Defense, the lessons of this experience, and the problems encountered in the experiments with PPB in other departments and agencies concerned with national security. In undertaking this review, the subcommittee's purpose is to be helpful both to the Executive Branch and to Congress. The inquiry will be conducted on a professional and nonpartisan basis.

During the 90th Congress, the subcommittee will hold hearings at which testimony will be given by present officials of the government and by other outstanding witnesses on the range of issues indicated in this staff memorandum.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

AUGUST 11, 1967.

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PLANNING-PROGRAMMING-BUDGETING

INITIAL MEMORANDUM

Introduction

In August 1965, President Johnson directed that a Planning-Programming-Budgeting System (PPBS) be installed throughout the Executive Branch, to be supervised by the Bureau of the Budget. The Subcommittee on National Security and International Operations is reviewing the application of this system in the national security area. The purpose of this staff memorandum is to provide a guide to questions on which the subcommittee may wish to take testimony during the 90th Congress.

PPBS: What Is It?

Sitting at the apex of the Federal Government, a President is keenly aware of the shortage of resources for pursuing desirable goals of public policy, and of the difficult choices this hard fact of life imposes. Some goals must be eliminated, some postponed, others reduced in order to tailor the desirable to the feasible. A President needs the best help he can get in establishing an intelligent scale of priorities, choosing policies that would achieve desired results at the least cost, and marshaling, through Congress, the required resources.

In matters of defense and foreign policy, a President seeks aid from many quarters—State and Defense, his own staff, the National Security Council, task forces, other departments and agencies involved with national security matters, members of Congress, and private citizens. In addition, the budgetary process helps to bring things into focus—to weigh domestic versus foreign needs and to set priorities, to compare costs and benefits of competing programs, and once the budget has been fixed, to exercise Presidential direction and control of the operations of the Executive Branch.

The Planning-Programming-Budgeting System is one more step in a continuing endeavor to make the budgetary process a more versatile and helpful instrument of the President and his principal advisers. As its name suggests, it is an effort to tie forward planning to budgeting via programming. Key elements in the approach are program budgeting and systems analysis.

The traditional budget has been prepared and presented in terms of objects of expenditure, or "inputs," in the new jargon. In this form the budget has not shown the link between agency spending and agency purposes—between the resources an agency uses and its missions or tasks, now, of course, called "outputs." By linking resources to purposes, inputs to outputs, in a program, and by planning

ahead for several years, the program budget is expected to contribute to better appraisal by decision-makers of what a budget cut or increase would mean in terms of an agency's program—the goals to be pursued and the goals to be sacrificed or deferred.

Systems analysis is intended to present decision-makers with a systematic and comprehensive comparison of the costs and benefits of alternative approaches to a policy goal, taking advantage of techniques variously described as operations research or cost-effectiveness studies. There is an emphasis on quantitative analysis. Computers have made it possible to handle large quantities of data and applied mathematics has provided ingenious statistical techniques for dealing with some kinds of uncertainty.

Some of the less historically-minded proponents of PPBS strongly imply that it is something brand new, providing decision-makers for the first time with a rational basis for choosing between alternative policies. Actually, cost-benefit analysis seems to have begun in the Garden of Eden (see *Genesis*, 3), and the problem from the outset has been to avoid an underestimation of costs and an overestimation of benefits. Costs and gains have been compared throughout our government's history whenever a decision to spend or not to spend had to be made, and Congress explicitly called for cost-benefit studies as far back as the Rivers and Harbors Act of 1902. Operations research demonstrated its usefulness in World War II. Statistical control, pushed by Robert Lovett as Assistant Secretary of War for Air in World War II, was the forerunner of many functions of the Comptroller of the Defense Department and a predecessor of systems analysis. The idea of performance or program budgeting can be traced back at least to President Taft's Commission on Economy and Efficiency, which published its path-breaking report, "The Need for a National Budget," in 1912. And program budgets for periods extending well into the future have long been the rule in progressive banks and business firms.

PPB may for the first time identify these techniques as a "system," give them a special name, and advertise them, but the approach itself is as old as the problem of the buyer who would like to make two purchases and has money only for one.

Some of the more enthusiastic advocates of PPBS seem to suggest that it can work miracles in all corners of government. But it is no magic wand. It is a set of sharp tools which in experienced hands and guided by sound judgment can be a helpful aid in some of the business of government.

In his original statement of August 25, 1965, directing the extension of PPBS throughout the Federal Government, President Johnson said that, once the new system is in operation—

. . . it will enable us to:

- (1) Identify our national goals with precision and on a continuing basis
- (2) Choose among those goals the ones that are most urgent
- (3) Search for alternative means of reaching those goals most effectively at the least cost
- (4) Inform ourselves not merely on next year's costs, but on the second, and third, and subsequent year's costs of our programs

- (5) Measure the performance of our programs to insure a dollar's worth of service for each dollar spent.

These are high hopes. It remains to be seen to what extent PPBS will fulfill them.

The Experience in Defense

The major experiment to date with PPB began in the Department of Defense in 1961, and the system has been applied to six defense budgets—Fiscal Years 1963 through 1968.

Very strong claims are made for the contribution of PPB to Defense. Charles Hitch, who as Comptroller of the Defense Department had the primary responsibility for fashioning and directing the system, summarized his view of it in these words:

. . . we have provided for the Secretary of Defense and his principal military and civilian advisors a system which brings together at one place and at one time all of the relevant information that they need to make sound decisions on the forward program and to control the execution of that program. And we have provided the necessary flexibility in the form of a program change control system. Now, for the first time, the largest business in the world has a comprehensive Defense Department-wide plan that extends more than one year into the future. And it is a realistic and responsible one—programming not only the forces, but also the men, equipment, supplies, installations, and budget dollars required to support them. Budgets are in balance with programs, programs with force requirements, force requirements with military missions, and military missions with national security objectives. And the total budget dollars required by the plan for future years do not exceed the Secretary's responsible opinion of what is necessary and feasible.

With this management tool at his command, the Secretary of Defense is now in a position to carry out the responsibilities assigned to him by the National Security Act, namely, to exercise "direction, authority, and control over the Department of Defense"—and without another major reorganization of the defense establishment.

This Defense PPB system has, of course, been applied only during a period of rising national defense budgets (from \$54.3 billion in FY 1963 to about \$75 billion in FY 1967). It is not clear that the system would ease the problems of managing a contraction of the military services and of deciding, in a period of declining appropriations, what combination of forces would best promote the national interest.

Even in Defense the benefits of the PPB system have been overplayed by its proponents. It is not a statistical litmus paper, scientifically sorting good projects from bad. It may be used as easily to rationalize a decision as to make a rational choice. It is no substitute for experience and judgment, though men of experience and judgment may find it helpful.

The PPB approach was used to justify the purchase of a \$277 million oil-fueled aircraft carrier that was obsolete before it was

launched. Also, a perversion of cost-effectiveness was used, after the fact, in the largest single military aircraft contract in history, to rationalize the choice of an airplane whose costs are soaring, if not its performance. The latter case demonstrates that cost-effectiveness study, like any other management tool, can be misused—to becloud rather than illuminate judgment in the Executive Branch and Congress.

A major goal of PPB, according to Charles Hitch, was to enable the Secretary of Defense to run his Department on a unified basis, and PPB has meant a greater centralization of decision-making and control. A consequence, whether intended or not, is that it may be more difficult for voices of doubt and dissent at lower levels to make themselves heard at high levels. It means, among other things, less bargaining between OSD and the service departments and the services. This in turn makes it easier for OSD to ignore or simply not to hear things it would rather not hear—other beliefs about technological change, different estimates of costs and gains, conflicting views of the contingencies and the uncertainties. Defense programs may therefore be more nearly tailored to one estimate of the future and to one cost-benefit calculus than in a period when decision-making was less centralized.

All this underlines the fact that “unifying” is not without its dangers, particularly for the innovation of new weapons systems. Professor Roland McKean points out: “. . . rivalry under a rather decentralized system more than good analysis was probably responsible for the early development of Polaris and the subsequent Air Force interest in reducing vulnerability.” The evidence is not all in on how increased centralization has affected major force-level decisions, aircraft production rates, and initiatives on new major weapons systems, including the ABM. But there are obvious risks to which the President and Congress should be alert and which may suggest the need for reforms in Defense, at the Presidential level, and in Congress.

PPB aims at a systematic analysis of significant costs and benefits of alternative policies. But as a politician knows, sometimes the costs of an action, or failure to act, are heaviest not in dollars, but in a loss of confidence or a failure of will or a collapse of morale. Benefits also may show up in an improvement in these intangible factors of will and psychology rather than on the cash register. Priceless is not a synonym for worthless. An analysis which emphasizes cost-effectiveness and gives special attention to quantification runs the risk of short-changing or ignoring non-quantifiable costs and benefits. Skybolt presumably did not meet the Defense tests of cost-effectiveness, but one wonders whether, in estimating the costs of its cancellation, allowance was made for the impact on the British Government and perhaps on French policies in Atlantic and West European affairs.

These questions might be asked:

1. The programming system as it evolved under Charles Hitch is being modified in a number of respects by Robert Anthony who became Comptroller in September 1965. To what shortcomings in the system are the reforms directed?

2. A generally acknowledged difficulty has been the excessive detail, complexity and burdensome requirements of the defense programming and procurement process. Can it be simplified? Would a simpler

approach help to identify major issues early and to raise them promptly at the Presidential level, so that they will not be submerged in the clutter of smaller problems to be settled at the OSD or, hopefully, a lower level?

3. How has PPB been relevant or useful in Vietnam?

4. What lessons can be learned from the Skybolt decision, the level-of-U.S.-forces-in-Europe case, and from other decisions of importance to our allies?

5. Within the Defense Department program budgeting has appeared to be helpful in some programs and less useful in others—for example, General Purpose Forces and Research and Development. How might this experience bear on the application of PPB in non-Defense areas?

6. How has the introduction of PPB in Defense affected Congressional consideration of the defense budget?

Relevance to the State Department and Related Agencies

The State Department, like a number of other agencies, may find PPBS of little use. The differences between decision-making in defense and in foreign affairs, of course, make it impossible just to transfer budgetary procedures from Defense to State, AID, USIA and other national security programs.

In the nature of things, Defense must plan and program far ahead because of the time required to turn ideas into weapons. Foreign policy is more sensitive to day-to-day actions of other governments.

Furthermore, the difficulties of quantifying objectives, costs and benefits, in Defense are minor compared with the difficulties in foreign affairs. Defense deals in large part with end products that one can see, touch, measure, test-fire and ride in. State itself has virtually none of that; it deals mainly with the battle of ideas and interests called diplomacy. Also, the budgetary process as a whole does not serve effectively to bring foreign policy choices into focus.

Even apart from these factors, there has been no preparatory work in the foreign policy field remotely comparable to the decade of intensive work by RAND and others which preceded the large-scale application of programming and systems analysis in Defense, and the number of people trained and skilled in both the conduct of foreign affairs and the techniques of modern management is very limited. Charles Hitch himself has sounded a cautionary note:

. . . there are risks and dangers as well as opportunities in trying to move too far too fast in the application of new management techniques like these, including the risk of discrediting the techniques.

The foreign affairs agencies are still grappling with PPBS to learn what it means for them.

A special problem: the Office of the Secretary of State has not yet found means to take the proffered role of Presidential agent for the "overall direction" of interdepartmental activities overseas, and to play it vigorously. The difficulties are great, and it is unlikely that PPBS provides an answer to the problem. An effort has been made to assist State by establishing a Senior Interdepartmental Group (SIG) with the Under Secretary of State as its Executive Chairman, and

Interdepartmental Regional Groups (IRG), chaired by the regional Assistant Secretaries of State. This experiment, however, seems to be languishing.

These questions follow:

1. What problems have been encountered in implementing the President's directive on PPBS with respect to State and related agencies?

2. To what extent are the difficult foreign policy decisions that must be faced by the President, the Secretary of State, and the heads of related agencies ones on which budgetary considerations are of great or determining influence?

3. At this stage of the development of systems analysis, can it play a constructive role in foreign policy decision-making?

4. Are some aspects of the operations of State, AID, and other foreign affairs agencies adapted to programming and cost-benefit analysis?

5. Would PPBS be helpful in any way in the work of the Senior Interdepartmental Group (SIG) and the Interdepartmental Regional Groups (IRG)?

6. An attempt is being made to develop an "inter-agency foreign affairs programming system." Does this contemplate a more prominent role in policy-making for the Bureau of the Budget in relation to State and other departments? What arguments are advanced by proponents and opponents of the system?

Implications for the President and Congress

Does PPBS provide a wholly rational basis for decision-making? Have we arrived at that technocratic utopia where judgment is a machine-product?

Not even the zealots of PPBS would answer these questions affirmatively, although some of them talk as though we should be moving in this direction. Professor Frederick Mosher, for example, has noted the frequency of authoritarian language:

In all the literature I have read about PPBS . . . only a very few authors have even mentioned the executive and legislative processes of review and decision. The President and Congress seem to be regarded as enemies of rationality . . . Much of the literature of PPBS resembles that of the technocrats of the thirties; its aim seems to be to eliminate *politics* from decisionmaking.

It would be as easy of course to take H₂O out of water as to take politics out of decisions. Our political system is a system for making decisions on matters of public interest. We do not propose to delegate this task to a dictator, no matter how benevolent, or to an expert, no matter how objective, or to a computer, no matter who programs it. Indeed, we do not propose to leave it to any one person, but have built what we call "checks and balances" into our decision-making system. At the heart of our democratic form of government are the principles of executive accountability and Congressional review of Executive action.

The temperate proponents of PPBS claim only that their approach will help to sharpen the intuition and improve the judgment of decision-makers by providing them with more, better, and more timely information. They do not aspire to replace our decision-makers although they might want to arrange the contents of their in-boxes.

It is easy to agree that good analysis is preferable to poor analysis. If the President and his principal assistants believe that PPBS studies and analyses are helpful and an improvement over what they had before they will surely want to see the techniques developed and extended.

It is not clear however that PPBS will win or should win a President's unqualified support. A President needs and wants, for example, freedom to shift his plans and respond flexibly to new situations. Professor Aaron Wildavsky points out:

It is well and good to talk about long-range planning; it is another thing to tie a President's hands by committing him in advance for five years of expenditures. Looking ahead is fine but not if it means that a President cannot negate the most extensive planning efforts on grounds that seem sufficient to him. He may wish to trade some program budgeting for some political support.

To some extent, the planner and the politician are and ought to be at odds. The planner tries to foresee, in order to plan intelligently. A plan rests on today's best estimates of future needs. A politician knows how dimly we can foresee at best, how inadequate the information on the basis of which he must decide and act, how full of surprises history is, how desirable, therefore, to postpone decisions that can be postponed, and how much one depends, in the final analysis, on intuition and judgment based on experience.

A President will look at a program budget skeptically—or should—for he will sense that some costs may have been overlooked and some benefits overestimated—and he may also sense the temptation of assistants to write plans and programs that rationalize their hunches. He will take seriously the lesson of the struggle to get nuclear propulsion for the Navy—a lesson described in these words by Admiral Rickover:

Nuclear power has served to demonstrate the fallibility of expert cost accountants. In so doing, this issue has served a useful purpose. This has resulted in delay in achieving a stronger Navy, but in the long run it may have been worthwhile.

Out of this issue has again been demonstrated the fact that politics is more difficult than physics or cost accounting, and that it is politicians who saw the truth before the cost accountants. The primacy of politics should not again be subordinated to the doctrinaire and unproved claims of specialists—particularly when these specialists are in a position of overall authority and do not encourage or permit contrary views to be voiced or to be asserted.

Congress, too, may not welcome all the implications of PPBS. The experience to date does not suggest that the Department of Defense is likely to place before Congressional committees the analyses of costs

and benefits of competing policies and programs on which the Department based its own choices. Without such comparisons, however, Congress will be in the dark about the reasons for selecting this policy over that. It may be that Congress will wish to improve its own capability for systematic analysis of public problems in order to compete on more even terms with the Executive Branch. Furthermore, the more centralized decision-making becomes in the Executive Branch, the more important some competition of this sort from Congress might be.

Congress may also be concerned with the impact of PPBS on the distribution of power within the Executive Branch. The centralizing bias of PPBS may be more important than the anticipated technical improvements of the budgetary process, because of a lessening of competitive forces within the Executive Branch. Congress will also be interested, of course, in how the changes in the Executive Branch will affect the role of Congress in the formulation of national security policy and the establishment of national security budgets.

If PPBS develops into a contest between experts and politicians, it will not be hard to pick the winners. They will be the politicians in the Congress and the White House. It has been said, and correctly, that as interesting as observing what happens to government when confronted with PPB will be watching what happens to PPB when confronted with government.



PLANNING-PROGRAMMING-BUDGETING

INTERIM OBSERVATIONS

A STUDY

SUBMITTED BY THE

SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS

(Pursuant to S. Res. 212, 90th Cong.)

TO THE

COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE



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FOREWORD

The Subcommittee on National Security and International Operations has been making a nonpartisan study of the Planning-Programming-Budgeting System (PPBS) initiated in the Department of Defense in 1961, and formally extended to other major federal departments and agencies by President Johnson's directive of August 25, 1965. Consistent with its jurisdiction, the focus of the subcommittee has been on the PPB effort in the national security area.

In its study, the subcommittee has examined the hazards as well as the opportunities in the use of program budgeting, systems analysis and cost-effectiveness methods. We have sought to get the basic issues relating to these tools and management devices out in the open, to encourage, to the extent possible, a sound estimate of their worth.

The subcommittee solicited the views of eminent authorities, published studies and memoranda on the issues of the inquiry, and held a series of hearings during which informed witnesses testified from their differing perspectives. These hearings and our subcommittee publications (listed at the conclusion of this report) have found a wide audience in this country and abroad among government officials, in business circles, and in colleges, universities and research centers.

The subcommittee will continue to monitor the application of program budgeting and analysis in national security affairs. The purpose of this staff report is to make available certain interim comments.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

DECEMBER 2, 1968.

PLANNING-PROGRAMMING-BUDGETING

INTERIM OBSERVATIONS

The quest for national security is not the work of a year or a decade. It is an unending task—and in a world in which technologies and expectations are changing rapidly and in which our Nation faces powerful and unpredictable adversaries, it is a task where mistakes in policy can ill be afforded. Procedures and arrangements that were scarcely adequate even for a simpler and safer time will not necessarily do, and those whom we place in positions of responsibility need better help than ever before.

As one step in the continuing effort to improve our national policy processes, President Johnson decided in August 1965 that a Planning-Programming-Budgeting System (PPBS) should be introduced throughout the Executive Branch, along the lines of the system introduced into the Department of Defense starting in 1961.

Stripped of the technical verbiage which characterizes the imperialism of specialists in all fields, PPBS is an effort to help policy-makers make better policies.

A key element is the *program budget*, that is, a budget which links the goals the policy-maker hopes to accomplish to the expenditures by which he proposes to meet these goals. In theory, a program budget would display not only initial, first-year costs but also full costs over the life of the proposed program, or at least over a period of several years.

A second key element in the PPB approach is analysis, and, in particular, an art-form known as *systems analysis* that attempts to provide the policy-maker with a comprehensive and orderly measure of the advantages and disadvantages of alternative means of accomplishing a given end, relying heavily on quantitative data.

It is still too early to reach definitive judgments on the contributions program budgeting and systems analysis can make to the improvement of the national policy process. It is not too early, however, to derive some lessons from DOD experience and from the initial experiments with PPB in other departments and agencies concerned with defense and foreign policy.

Drawing on the testimony and counsel presented to the subcommittee, the following observations seem appropriate at this time:

One: PPB is a tool. Like any tool, it can be useful in experienced hands—and dangerous in unqualified and injudicious hands.

It is *not* a device by which a policy-maker can safely delegate his decisions to subordinates, advisers, and consultants, in the belief that the system will produce “scientific” (and therefore unassailable) solu-

tions. Given Ptolemaic assumptions, a computer will produce geocentric conclusions. The analyses generated by the PPB approach involve conjectures or assumptions of critical importance. A responsible decisionmaker will want to make or assess these conjectures for himself—and no responsible analyst would have it any other way.

Two: Modern management techniques have obviously come to the Department of Defense to stay. Without them the direction of the world's largest single enterprise would impose impossible burdens on its chief.

The law puts the Secretary of Defense in charge of his Department. It does not tell him how to take charge. To be chief in more than name, he must see to it that key policy issues and key conflicts of judgment among Indians in and out of uniform are presented to him in intelligible form.

Military requirements will continue to exceed the resources a President and a Congress will be prepared to provide: hard choices are inevitable, and the use of cost-benefit criteria will help a Secretary on certain of these choices.

Historically, program budgeting has been applied mainly, and most successfully, in decisions that are chiefly budgetary. Though many decisions in the Defense Department are not primarily matters of resource allocation, the defense budget is so large that the scope for skillful budgetary practice is considerable.

Moreover, for a Secretary of Defense the budgetary process can provide a powerful means of exercising his general authority over defense policy. As Thomas Schelling emphasized to the subcommittee:

Some people have more instinct than others, or better training than others, for using the purse strings as a technique of management and a source of authority . . . but almost anyone concerned with administration sooner or later discovers that control of budgetary requests and disbursements is a powerful source of more general control.

The programming-budgeting system as introduced and developed in the McNamara tenure has already been adjusted and modified, and further changes will be made as future Secretaries of Defense bring their unique talents and styles of operation to the Department.

For example, a Secretary may wish to retain the program-budget approach and the capability it provides for control of those matters on which he wishes to act, yet decentralize many detailed decisions that were brought to a predecessor. Another Secretary may also rely less on a central systems analysis staff as strong and sophisticated centers of analysis develop in other elements of DOD.

Three: PPB was extended to all major federal departments and agencies in August 1965 without a period of selective experimentation and testing in non-defense departments and agencies. At that time, some BOB officials argued for a step-by-step approach, and with the advantage of hindsight it is now apparent that this advice was wise.

The top management of some agencies, such as AID, was ready for PPB. For many years, in preparing foreign aid budgets, AID had been trying to relate American assistance more closely to country de-

velopment programs looking several years ahead and to economic aid available from international agencies and other outside sources. In principle, program budgeting should be able to contribute to an improvement of economic assistance programs, for AID is engaged in the kind of resource allocation problems suited to this approach. As William S. Gaud, Administrator of AID, told the subcommittee:

. . . in August 1965, when President Johnson announced Government-wide adoption of the PPB system, the directive came to AID not as a shock, but as a fillip. In fact it was a confirmation of what we were already doing.

Top management in some other agencies, however, was not persuaded that PPB was well suited for their tasks. Yet for PPBS to work there must be a responsible person or body that wants this tool to help provide the organized data and arguments on which to base a decision. Thomas Schelling expressed it this way:

PPBS works best for an aggressive master; and where there is no master . . . the value of PPBS is likely to be modest and, depending on the people, may even be negative.

Even for some willing and interested consumers it was difficult to learn what PPB could do for them and how to comply with the requirements set by BOB. As Frederick Mosher put it to the subcommittee:

Clearly, in most areas of federal activity, the Defense model of PPBS could be helpful only in peripheral ways. Most would have to develop their own blueprints, adapted to their own subject matter, their own power structure, their own environment, and their own culture.

Furthermore, there had been little or no preparatory work in the foreign policy field (or most domestic fields) in any way comparable to the decade of study and experience at the RAND Corporation and elsewhere that provided techniques and trained analysts for the application of PPB to defense problems.

Whatever the reasons may be, the exaggerated hopes of some that PPB would enable the Executive Branch to identify national goals with precision, determine which goals are most urgent, and measure exactly the costs and benefits of alternative policies, have died away.

Four: In the application of PPB, it is important to take careful account of the special circumstances and needs of different agencies and not to force all into the same Procrustean bed.

While the new techniques may be mutually supporting in some cases, a caution is in order. As Charles Hitch has said:

. . . we are not dealing here with a matter of either/or. There is an infinity of degrees. Not only may one introduce a program budget without systems analysis or vice versa, but each may be used in limited areas or ways, and sometimes quite productively.

Inflexibility could be the *rigor mortis* of PPB.

It is encouraging that PPB requirements have become more elastic since 1965:

—Initially, federal agencies were required to submit comprehensive five year projections of all their programs; this unrealistic demand was changed in 1967 to require such projections *only* for programs already approved.

—By all accounts, the elaborate and stereotyped BOB requirements for “program memoranda” on matters small and large, peripheral and central, back-burner and front, tended to produce archives of superficial and uninteresting papers—unread by busy officials, who do, on the whole, try to make good use of their time. In 1968 it was decided to require agencies to prepare “program memoranda” not for all “program categories” but *only* for programs within which major policy issues have been identified.

—Confusion and unnecessary work for both agency and BOB staffs resulted from the two-track system of budget presentations, one geared to program budgeting and the other to conventional appropriation categories. In 1968 agencies were encouraged to make adjustments that would assist in integrating program and appropriations structure, where this could be done without impairing the usefulness of the program budget format for Executive Branch program decisions.

—The effort to impose a PPB structure on State’s budget was suspended in 1967 (except in connection with international educational and cultural exchange programs) and has not been resumed. The hard decisions in foreign affairs are laden with value judgments that elude quantification and are typically little affected by the constraints of State’s own budget.

Adaptation, experimentation and selectivity are now on the PPB menu.

Five: A major issue today as in the past is how best to generate more coherence in the planning and operations of the several departments and agencies in the field of foreign affairs.

Would the installation of an interagency foreign affairs program budget be a promising way to extend and strengthen the authority of the Secretary of State over the conduct of foreign affairs? Is this what a President and his Secretary of State want? And is this what Congress wants? Would the expected advantages of central direction and control justify the move away from the real, or fancied, advantages of the decentralized initiative and responsibility of agencies like USIA, AID, the Peace Corps, the Department of the Treasury, and others?

Considering the complexities and ambiguities of these issues, it is not surprising that the Bureau of the Budget and the Department of State have been, to use the words of BOB Director Charles Zwick, “moving forward pragmatically and deliberately.”

Interesting experimental efforts underway include:

—the ongoing CASP project (Country Analysis and Strategy Paper), which is being tried in State’s Bureau of Latin American Affairs and which attempts to relate, systematically and explicitly, our policies and programs to our objectives, country by country, throughout the region;

—an interagency effort, sponsored by the State-chaired Senior Interdepartmental Group (SIG), to develop a model foreign affairs program budget for one country; and

—participation by the SIG in the review of programs and budgets of agencies with overseas responsibilities.

Six: Nowhere is the need for improved policy analysis more critical than in foreign affairs.

Given the fashionableness of quantitative analysis and the magic aura surrounding the computer, it is unfortunately the case that some analysts are tempted to employ quantitative methods where they are clearly inappropriate, may introduce distortions, and can do positive harm.

Policy analysis need not be dominated by methods that risk short-changing, ignoring, or misreading non-quantifiable costs and benefits. But it sometimes is; some people seem to believe there is safety in numbers. The good foreign affairs analyst has of course always attempted an “advantage-disadvantage” (as contrasted to a “cost-benefit”) analysis of alternative policies for pursuing foreign policy goals.

It may be that a concerted effort by the Department of State would reveal methodological insights and techniques that could improve foreign policy analysis. For example, much might be gained if the Department of State worked out arrangements with a few universities and organizations like RAND where pioneer work in policy analysis is underway. Promising officers could be assigned to these centers for training and experience in a variety of analytical techniques, as a means of seeking new skills that might add to the Department’s capabilities.

Seven: Members of Congress clearly have not welcomed all the implications of PPB.

Under our Constitution, Congress is responsible for the authorization of programs and the appropriation of funds. Congress is obviously concerned when an Executive Branch official steers away from careful analysis of his pet projects. James Schlesinger posed the issue in these words for the subcommittee:

Will the decisionmaker tolerate analysis—even when it
is his own hobby horses which are under scrutiny?

How many hobby horses are there?

Are they off limits to the analysts?

It would be helpful for the Executive Branch to provide Congress with more high quality studies in support of program proposals. Provided that the needs of security can be satisfied, and experience suggests that they can be, an independent evaluation by Congress of the rationale for key programs should make a net contribution to the quality of our national policy process. Members of Congress would, of course, look at supporting studies skeptically, since they are well aware that figures can be used to mislead as well as to clarify. Analyses are bound to vary in quality, some are designed more to support a preconception than to challenge it, and critical assumptions will often be hidden or unstated.

Meanwhile, Congress needs to increase the capabilities of its own committees and their professional staffs for the analysis of policy problems, and to take better advantage of consultants and other sources of advice and counsel to improve its contributions to the decisions on which the safety and welfare of the nation depend.

90th Congress }
2d Session }

COMMITTEE PRINT

SPECIALISTS AND GENERALISTS

A Selection of Readings

COMPILED BY THE
SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS
(Pursuant to S. Res. 212, 90th Cong.)
OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE



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FOREWORD

In our study of the planning, programming, budgeting process in the national security area, we thought it would be useful to encourage reflection on the roles of the specialist and the generalist in government.

This subject has been discussed since the dawn of political thought. There are interesting insights in proverbs, fables, and historical episodes, as well as in more analytical writings.

Modern-day specialists can make important contributions in decisionmaking; but there is no substitute in government for the wise generalist with skill and shrewdness in judging the competence of specialists and in determining the operational feasibility and political acceptability of any plan of action. It is a skill that can come when a specialist widens his interests and takes on assignments presenting broadened challenges—particularly the challenges of dealing with people in a range of different situations at home and overseas.

Prepared by the subcommittee staff, this publication is intended to make available in convenient form a variety of comment on the specialist and the generalist. Selections are arranged in approximate chronological order.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

NOVEMBER 7, 1968.

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[From *Aesop's Fables*, Revised by J. B. Rundell, 1869]

THE MICE IN COUNCIL

By Aesop

(c. 620-560 B.C.)

A CERTAIN Cat that lived in a large country-house was so vigilant and active, that the Mice, finding their numbers grievously thinned, held a council, with closed doors, to consider what they had best do. Many plans had been started and dismissed, when a young Mouse, rising and catching the eye of the president, said that he had a proposal to make, that he was sure must meet with the approval of all. "If," said he, "the Cat wore around her neck a little bell, every step she took would make it tinkle; then, ever forewarned of her approach, we should have time to reach our holes. By this simple means we should live in safety, and defy her power." The speaker resumed his seat with a complacent air, and a murmur of applause arose from the audience. An old grey Mouse, with a merry twinkle in his eye, now got up, and said that the plan of the last speaker was an admirable one; but he feared it had one drawback. He had not told them who should put the bell around the Cat's neck.

[From Fragments of Heracleitus, *Heracleitus, On the Universe* (English translation by W. H. S. Jones), William Heinemann Ltd., London, MCMXXXI]

THE WAY OF INQUIRY

By Heracleitus

(c. 535-475 B.C.)

I searched for myself.

The things that can be seen, heard and learnt, these I honour especially.

Eyes are more accurate witnesses than ears.

Much learning does not teach understanding, or it would have taught Hesiod and Pythagoras, as well as Xenophanes and Hecataeus.

Pythagoras, son of Mnesarchus, practised research more than any other man, and choosing out these writings claimed as his own a wisdom that was only much learning, a mischievous art.

Of all those whose discourses I have heard, not one attains to this, to realise that wisdom is a thing apart from all.

Wisdom is one thing—to know the thought whereby all things are steered through all things.

[From Thucydides, *The Peloponnesian Wars* (Jowett Translation), Richard Sadler and Brown Ltd., 1966]

PORTRAIT OF A POLITICAL LEADER

By Thucydides

(c. 471–400 B.C.)

PERICLES AND HIS SUCCESSORS

After the second Peloponnesian invasion, now that Attica had been once more ravaged, and war and plague together oppressed the Athenians, a change came over their spirit. They blamed Pericles because he had persuaded them to go to war, declaring that he was the author of their troubles; and they were anxious to come to terms with the Lacedæmonians. Accordingly, envoys were dispatched to Sparta, but they met with no success. Completely at their wits' end, they turned upon Pericles. He saw that they were exasperated by their situation and were behaving just as he had always anticipated that they would. As he was still general, he called an assembly, wanting to encourage them and to convert their angry feelings into a gentler and less fearful mood. At this assembly he came forward and spoke somewhat as follows:

“I was expecting this outburst of anger against me, for I can see its causes. And I have summoned an assembly to remind you of your resolutions and reprove you if you are wrong to display anger against me and want of tenacity in misfortune. In my judgment it is better for individuals themselves that the citizens should suffer and the state as a whole flourish than that the citizens should prosper singly and the state communally decline. A private man who thrives in his own business is involved in the common ruin of his country; but if he is unsuccessful in a prosperous city he is much more likely to be saved in the end. Seeing then that states can bear the misfortunes of individuals, but that no individual can bear the misfortunes of his state, let us all stand by our country and not do what you are doing now. Because you are stunned by your domestic calamities, you are abandoning the safety of the commonwealth and blaming not only me who advised the war but yourselves who consented to it. And yet what sort of man am I to provoke your anger? I believe that I am second to none in devising and explaining a sound policy, a lover of my country, and incorruptible. Now a man may have a policy which he does not clearly expound, and then he might as well have none at all; or he may possess both qualities but be disloyal to his country, and then he would not be so apt to speak in her interest; or again, though loyal, he may be unable to resist a bribe, and then all his other good qualities would be sold for money. If, when you determined to go to war, you even half-believed me to have somewhat more of the qualities required than others, it is not fair that I should now be charged with doing wrong.

“I allow that for men who are fortunate in other respects and free to choose it is great folly to make war. But when it is necessary either to yield and at once take orders from others or to hold out at the cost of danger, it is more blameworthy to shun the danger than to

meet it. For my own part, I am unchanged and stand where I did. It is you who are changed; you repent in suffering of decisions you made when unhurt, and you think that my advice was wrong because your own judgment is impaired. The pain is present and comes home to each of you, but the good is as yet not manifest to any one; and your minds have not the strength to persevere in your resolution, now that a great vicissitude has overtaken you unawares. Anything which is sudden and unexpected and utterly beyond calculation enthalls the spirit of a man. This is your condition, especially as the plague has come upon other hardships. Nevertheless, as the citizens of a great city, educated in a temper of greatness, you should not succumb even to the greatest calamities nor darken the luster of your fame. For men think it equally right to hate the presumption of those who claim a reputation to which they have no title and to condemn the faintheartedness of those who fall below the glory which is their own. You should put away your private sorrows and hold fast to the deliverance of the commonwealth.

“Perhaps you fear that the strain of the war may be very great and, after all, end in defeat. I have shown you already over and over again that this fear is groundless, and that should be enough. But I will make plain this further point. It seems to me that you yourselves have never reflected on one feature of your imperial greatness, which I too have never mentioned before; nor would I now, because the claim is rather arrogant, if I did not see that you are unreasonably panic-stricken. You think that your empire is confined to your allies; but I say that of the two divisions of the world plainly at man’s service, the land and the sea, you are absolute masters of one, not only to the degree to which you now exercise mastery, but as widely as you please. Neither the great King nor any nation now on earth can hinder you with your naval resources from sailing where you choose. To this great power, the use of houses and lands, the loss of which seems so dreadful to you, is as nothing.

“We ought not to be troubled about them or to think much of them in comparison; they are only the garden of the house, the ornament of wealth; and you should realize that if we hold fast to our freedom and preserve it, we shall easily recover them, but that men who submit to others commonly lose all they have previously acquired. You must decide not to fall doubly short of your fathers. For they did not inherit the empire from others but won it by their exertions, and preserved it and bequeathed it to us. But to be robbed of what you have is a greater disgrace than to be unfortunate in trying to acquire more. Meet your enemies therefore, not only with spirit, but with disdain. Even a coward may brag out of ignorance blessed by fortune, but a man can afford disdain when his confidence in his superiority over adversaries is grounded in judgment: that is our position. When luck is even, daring is rendered more reliable by intelligence and the sense of superiority it gives; intelligence trusts less to hope, the strength of men who have no other resource, than to judgment based on facts, from which is derived sounder foresight.

“It is reasonable for you to support the imperial dignity of your city in which you all take pride; you should not covet glory unless you will make exertions. And do not imagine that you are fighting about a

simple issue, freedom or slavery; you have an empire to lose, and there is the danger to which the hatred of your imperial rule has exposed you. Neither can you any longer resign your power if, at this crisis, any timorous spirit is for playing the peace lover and the honest man. For by this time your empire has become a despotism, which it is thought unjust to acquire but unsafe to surrender. The men of whom I was speaking, if they could find followers, would soon ruin a city, and if they were to go and found a state of their own, would equally ruin that. The love of peace is secure only in association with the spirit of action; in an imperial city it is of no use, but it is suited to subjects who enjoy safety in servitude.

“You must not be led away by the advice of such citizens as these nor be angry with me, for the resolution in favor of war was your own as much as mine. What if the enemy had come and done what he was likely to do when you refused to submit? What too if the plague followed? That alone was an unexpected blow, but we might have foreseen all the rest. I am well aware that your hatred of me is aggravated by it, but how unjustly, unless you also ascribe to me the credit of any extraordinary success you may gain! The visitations of heaven should be borne as inevitable, the sufferings inflicted by the enemy with manliness. This has always been the spirit of Athens, and should not die out in you now. You should recognize that our city has the greatest name in all the world because she does not yield to misfortunes, but has sacrificed more lives and endured severer hardships in war than any other; therefore she also has the greatest power of any state up to this day, and the memory of her glory will always survive. Even if we should some day weaken a little, for by nature all things decline—yet will the recollection live, that, of all Hellenes, we ruled over the greatest number of Hellenic subjects; that we withstood our enemies, whether single or united, in the most terrible wars; and that we were the inhabitants of a city endowed in every way with the most ample resources and greatness. The peace lover may indeed find fault, but every man of action will emulate us, and the powerless envy us. Hatred and unpopularity at the time have ever been the fate of those who have aspired to empire. But it is good judgment to accept odium in a great cause; hatred does not last long, and the brilliance of the moment and fame of afterdays remain forever in men’s memories. Looking forward to future glory and present avoidance of dishonor, make the effort now to secure both. Send no more heralds to the Lacedæmonians, and do not betray to them that you are depressed by the present strain. For the greatest states and the greatest men are those which, when misfortunes come, are the least distressed in spirit and the most resolute in action.”

By such words Pericles endeavored to appease the anger of the Athenians against himself, and to divert their minds from their terrible situation. In the conduct of public affairs they took his advice and sent no more embassies to Sparta but turned instead to prosecuting the war. Yet as individuals they felt their sufferings keenly; the common people had been deprived even of the little which they possessed, while the upper class had lost fine estates in the country with all their houses and rich furniture. Worst of all, instead of enjoying peace, they

were now at war. The universal indignation was not pacified until they had fined Pericles; but, soon afterwards, with the usual fickleness of the masses, they elected him general and committed all their affairs to his charge. Their domestic sorrows were beginning to be less acutely felt, and for the needs of the city as a whole they thought that there was no man like him. During the peace while he was at the head of affairs, he showed moderation as a leader; he kept Athens safe, and she reached the height of her greatness in his time. When the war began he showed here too his foresight in estimating Athenian power. He survived two years and six months; and, after his death, his prescience regarding the war was even better appreciated. For he told the Athenians that if they were not restless, and would attend to their navy, and not seek to enlarge their dominion while the war was going on, nor imperil the existence of the city, they would come through; but they did all that he told them not to do; and in other matters which apparently had nothing to do with war, they adopted bad policies at home and in their empire because of private ambitions and private interests, policies whose success brought honor and profit chiefly to individuals, while their failure did harm to the city in the conduct of the war.

The reason was that he was powerful in mind and public esteem and a man of most transparent integrity, and he controlled the people in a free spirit; he led them himself rather than followed them; for, not seeking power by dishonest practices, he did not speak to gratify the people, but, possessing power based on his high character, he would oppose them and even provoke their anger. Whenever he saw them inopportunely elated and arrogant, he would by his speeches strike them with fear and alarm; and when they were unreasonably apprehensive, he would reanimate their confidence. Thus Athens, though in name a democracy, was in fact coming to be ruled by her first citizen. But his successors were more on an equality with one another; as each was struggling to be first himself, they came to sacrifice the whole conduct of affairs to the gratification of the people. As was natural in a great and imperial city, this led to many errors, of which the greatest was the Sicilian expedition; here the chief error of policy did not lie so much in their decision to attack Sicily, but instead of consulting later for the interests of the expedition which they had sent out, they were occupied in private recriminations with a view to winning the leadership of the people, and not only hampered the operations of the army but became embroiled for the first time at home. And yet after they had lost in the Sicilian expedition the greater part of their fleet, besides other resources, and were already distracted by revolution at home, still they held out eight years, not only against their former enemies, but against the Sicilians who had combined with them, and against most of their own allies who had risen in revolt. Even when Cyrus, the son of the King, joined in the war and supplied the Peloponnesians with money to pay their fleet, they continued to resist and were at last overthrown only when they were ruined by their own internal dissensions. So that at the time Pericles was more than justified in the conviction at which his foresight had arrived, that the Athenians could very easily have the better of the unaided forces of the Peloponnesians.

[*The Dialogues of Plato* (Jowett Translation), Great Books Series, Encyclopaedia Britannica, Inc.]

POLITICAL UNDERSTANDING VS. TECHNICAL SKILLS

By Plato

(c. 427–347 B.C.)

FROM *Protagoras*

PERSONS: SOCRATES, *who is the narrator of the Dialogue to his Companion*; HIPPOCRATES; ALCIPLADES; PROTAGORAS, HIPPIAS, *Sophists*. SCENE: *The House of Callias*

When we were all seated, Protagoras said: Now that the company are assembled, Socrates, tell me about the young man of whom you were just now speaking.

I replied: I will begin again at the same point, Protagoras, and tell you once more the purport of my visit: this is my friend Hippocrates, who is desirous of making your acquaintance; he would like to know what will happen to him if he associates with you. I have no more to say.

Protagoras answered: Young man, if you associate with me, on the very first day you will return home a better man than you came, and better on the second day than on the first, and better every day than you were on the day before.

When I heard this, I said: Protagoras, I do not at all wonder at hearing you say this; even at your age, and with all your wisdom, if any one were to teach you what you did not know before, you would become better no doubt: but please to answer in a different way—I will explain how by an example. Let me suppose that Hippocrates, instead of desiring your acquaintance, wished to become acquainted with the young man Zeuxippus of Heraclea, who has lately been in Athens, and he had come to him as he has come to you, and had heard him say, as he has heard you say, that every day he would grow and become better if he associated with him: and then suppose that he were to ask him, “In what shall I become better, and in what shall I grow?”—Zeuxippus would answer, “In painting.” And suppose that he went to Orthagoras the Theban, and heard him say the same thing, and asked him, “In what shall I become better day by day?” he would reply, “In flute-playing.” Now I want you to make the same sort of answer to this young man and to me, who am asking questions on his account. When you say that on the first day on which he associates with you he will return home a better man, and on every day will grow in like manner,—in what, Protagoras, will he be better? and about what?

When Protagoras heard me say this, he replied: You ask questions fairly, and I like to answer a question which is fairly put. If Hippocrates comes to me he will not experience the sort of drudgery with which other Sophists are in the habit of insulting their pupils; who, when they have just escaped from the arts, are taken and driven back into them by these teachers, and made to learn calculation, and astronomy, and geometry, and music (he gave a look at Hippias as he

said this); but if he comes to me, he will learn that which he comes to learn. And this is prudence in affairs private as well as public; he will learn to order his own house in the best manner, and he will be able to speak and act for the best in the affairs of the state.

Do I understand you, I said; and is your meaning that you teach the art of politics, and that you promise to make men good citizens?

That, Socrates, is exactly the profession which I make.

Then, I said, you do indeed possess a noble art, if there is no mistake about this; for I will freely confess to you, Protagoras, that I have a doubt whether this art is capable of being taught, and yet I know not how to disbelieve your assertion. And I ought to tell you why I am of opinion that this art cannot be taught or communicated by man to man. I say that the Athenians are an understanding people, and indeed they are esteemed to be such by the other Hellenes. Now I observe that when we are met together in the assembly, and the matter in hand relates to building, the builders are summoned as advisers; when the question is one of ship-building, then the ship-wrights; and the like of other arts which they think capable of being taught and learned. And if some person offers to give them advice who is not supposed by them to have any skill in the art, even though he be good-looking, and rich, and noble, they will not listen to him, but laugh and hoot at him, until either he is clamoured down and retires of himself; or if he persist, he is dragged away or put out by the constables at the command of the prytanes. This is their way of behaving about professors of the arts. But when the question is an affair of state, then everybody is free to have a say—carpenter, tinker, cobbler, sailor, passenger; rich and poor, high and low—any one who likes gets up, and no one reproaches him, as in the former case, with not having learned, and having no teacher, and yet giving advice; evidently because they are under the impression that this sort of knowledge cannot be taught.

And not only is this true of the state, but of individuals; the best and wisest of our citizens are unable to impart their political wisdom to others: as for example, Pericles, the father of these young men, who gave them excellent instruction in all that could be learned from masters, in his own department of politics neither taught them, nor gave them teachers; but they were allowed to wander at their own free will in a sort of hope that they would light upon virtue of their own accord. Or take another example: there was Cleinias the younger brother of our friend Alcibiades, of whom this very same Pericles was the guardian; and he being in fact under the apprehension that Cleinias would be corrupted by Alcibiades, took him away, and placed him in the house of Ariphron to be educated; but before six months had elapsed, Ariphron sent him back, not knowing what to do with him. And I could mention numberless other instances of persons who were good themselves, and never yet made any one else good, whether friend or stranger. Now I, Protagoras, having these examples before me, am inclined to think that virtue cannot be taught. But then again, when I listen to your words, I waver; and am disposed to think that there must be something in what you say, because I know that you have great experience, and learning, and invention. And I wish that you would, if possible, show me a little more clearly that virtue can be taught. Will you be so good?

That I will, Socrates, and gladly. But what would you like? Shall I, as an elder, speak to you as younger men in an apologue or myth, or shall I argue out the question?

To this several of the company answered that he should choose for himself.

Well, then, he said, I think that the myth will be more interesting.

Once upon a time there were gods only, and no mortal creatures. But when the time came that these also should be created, the gods fashioned them out of earth and fire and various mixtures of both elements in the interior of the earth; and when they were about to bring them into the light of day, they ordered Prometheus and Epimetheus to equip them, and to distribute to them severally their proper qualities. Epimetheus said to Prometheus: "Let me distribute, and do you inspect." This was agreed, and Epimetheus made the distribution. There were some to whom he gave strength without swiftness, while he equipped the weaker with swiftness; some he armed, and others he left unarmed; and devised for the latter some other means of preservation, making some large, and having their size as a protection, and others small, whose nature was to fly in the air or burrow in the ground; this was to be their way of escape. Thus did he compensate them with the view of preventing any race from becoming extinct.

And when he had provided against their destruction by one another, he contrived also a means of protecting them against the seasons of heaven; clothing them with close hair and thick skins sufficient to defend them against the winter cold and able to resist the summer heat, so that they might have a natural bed of their own when they wanted to rest; also he furnished them with hoofs and hair and hard and callous skins under their feet. Then he gave them varieties of food—herb of the soil to some, to others fruits of trees, and to others roots, and to some again he gave other animals as food. And some he made to have few young ones, while those who were their prey were very prolific; and in this manner the race was preserved. Thus did Epimetheus, who, not being very wise, forgot that he had distributed among the brute animals all the qualities which he had to give—and when he came to man, who was still unprovided, he was terribly perplexed. Now while he was in this perplexity, Prometheus came to inspect the distribution, and he found that the other animals were suitably furnished, but that man alone was naked and shoeless, and had neither bed nor arms of defence. The appointed hour was approaching when man in his turn was to go forth into the light of day; and Prometheus, not knowing how he could devise his salvation, stole the mechanical arts of Hephaestus and Athene, and fire with them (they could neither have been acquired nor used without fire), and gave them to man. Thus man had the wisdom necessary to the support of life, but political wisdom he had not; for that was in the keeping of Zeus, and the power of Prometheus did not extend to entering into the citadel of heaven, where Zeus dwelt, who moreover had terrible sentinels; but he did enter by stealth into the common workshop of Athene and Hephaestus, in which they used to practise their favourite arts, and carried off Hephaestus' art of working by fire, and also the art of Athene, and gave them to man. And in this way man was supplied with the means of life. But Prometheus is said to have been afterwards prosecuted for theft, owing to the blunder of Epimetheus.

Now man, having a share of the divine attributes, was at first the only one of the animals who had any gods, because he alone was of their kindred; and he would raise altars and images of them. He was not long in inventing articulate speech and names; and he also constructed houses and clothes and shoes and beds, and drew sustenance from the earth. Thus provided, mankind at first lived dispersed, and there were no cities. But the consequence was that they were destroyed by the wild beasts, for they were utterly weak in comparison of them, and their art was only sufficient to provide them with the means of life, and did not enable them to carry on war against the animals: food they had, but not as yet the art of government, of which the art of war is a part. After a while the desire of self-preservation gathered them into cities; but when they were gathered together, having no art of government, they evil intreated one another, and were again in process of dispersion and destruction. Zeus feared that the entire race would be exterminated, and so he sent Hermes to them, bearing reverence and justice to be the ordering principles of cities and the bonds of friendship and conciliation. Hermes asked Zeus how he should impart justice and reverence among men:—Should he distribute them as the arts are distributed; that is to say, to a favoured few only, one skilled individual having enough of medicine or of any other art for many unskilled ones? “Shall this be the manner in which I am to distribute justice and reverence among men, or shall I give them to all?” “To all,” said Zeus; “I should like them all to have a share; for cities cannot exist, if a few only share in the virtues, as in the arts. And further, make a law by my order, that he who has no part in reverence and justice shall be put to death, for he is a plague of the state.”

And this is the reason, Socrates, why the Athenians and mankind in general, when the question relates to carpentering or any other mechanical art, allow but a few to share in their deliberations; and when any one else interferes, then, as you say, they object, if he be not of the favoured few; which, as I reply, is very natural. But when they meet to deliberate about political virtue, which proceeds only by way of justice and wisdom, they are patient enough of any man who speaks of them, as is also natural, because they think that every man ought to share in this sort of virtue, and that states could not exist if this were otherwise. I have explained to you, Socrates, the reason of this phenomenon.

And that you may not suppose yourself to be deceived in thinking that all men regard every man as having a share of justice or honesty and of every other political virtue, let me give you a further proof, which is this. In other cases, as you are aware, if a man says that he is a good flute-player, or skilful in any other art in which he has no skill, people either laugh at him or are angry with him, and his relations think that he is mad and go and admonish him; but when honesty is in question, or some other political virtue, even if they know that he is dishonest, yet, if the man comes publicly forward and tells the truth about his dishonesty, then, what in the other case was held by them to be good sense, they now deem to be madness. They say that all men ought to profess honesty whether they are honest or not, and that a man is out of his mind who says anything else. Their notion is, that a man must have some degree of honesty; and that if he has none at all he ought not be in the world.

I have been showing that they are right in admitting every man as a counsellor about this sort of virtue, as they are of opinion that every man is a partaker of it. And I will now endeavour to show further that they do not conceive this virtue to be given by nature, or to grow spontaneously, but to be a thing which may be taught; and which comes to a man by taking pains. No one would instruct, no one would rebuke, or be angry with those whose calamities they suppose to be due to nature or chance; they do not try to punish or to prevent them from being what they are; they do but pity them. Who is so foolish as to chastise or instruct the ugly, or the diminutive, or the feeble? And for this reason. Because he knows that good and evil of this kind is the work of nature and of chance; whereas if a man is wanting in those good qualities which are attained by study and exercise and teaching, and has only the contrary evil qualities, other men are angry with him, and punish and reprove him—of these evil qualities one is impiety, another injustice, and they may be described generally as the very opposite of political virtue. In such cases any man will be angry with another, and reprimand him,—clearly because he thinks that by study and learning, the virtue in which the other is deficient may be acquired. If you will think, Socrates, of the nature of punishment, you will see at once that in the opinion of mankind virtue may be acquired; no one punishes the evil-doer under the notion, or for the reason, that he has done wrong,—only the unreasonable fury of a beast acts in that manner. But he who desires to inflict rational punishment does not retaliate for a past wrong which cannot be undone; he has regard to the future, and is desirous that the man who is punished, and he who sees him punished, may be deterred from doing wrong again. He punishes for the sake of prevention, thereby clearly implying that virtue is capable of being taught. This is the notion of all who retaliate upon others either privately or publicly. And the Athenians, too, your own citizens, like other men, punish and take vengeance on all whom they regard as evil doers; and hence, we may infer them to be of the number of those who think that virtue may be acquired and taught. Thus far, Socrates, I have shown you clearly enough, if I am not mistaken, that your countrymen are right in admitting the tinker and the cobbler to advise about politics, and also that they deem virtue to be capable of being taught and acquired.

There yet remains one difficulty which has been raised by you about the sons of good men. What is the reason why good men teach their sons the knowledge which is gained from teachers, and make them wise in that, but do nothing towards improving them in the virtues which distinguish themselves? And here, Socrates, I will leave the apologue and resume the argument. Please to consider: Is there or is there not some one quality of which all the citizens must be partakers, if there is to be a city at all? In the answer to this question is contained the only solution of your difficulty; there is no other. For if there be any such quality, and this quality or unity is not the art of the carpenter, or the smith, or the potter, but justice and temperance and holiness and, in a word, manly virtue—if this is the quality of which all men must be partakers, and which is the very condition of their learning or doing anything else, and if he who is wanting in this, whether he be a child only or a grown-up man or woman, must be taught and punished, until by punishment he becomes better, and he

who rebels against instruction and punishment is either exiled or condemned to death under the idea that he is incurable—if what I am saying be true, good men have their sons taught other things and not this, do consider how extraordinary their conduct would appear to be. For we have shown that they think virtue capable of being taught and cultivated both in private and public; and, notwithstanding, they have their sons taught lesser matters, ignorance of which does not involve the punishment of death: but greater things, of which the ignorance may cause death and exile to those who have no training or knowledge of them—aye, and confiscation as well as death, and, in a word, may be the ruin of families—those things, I say, they are supposed not to teach them—not to take the utmost care that they should learn. How improbable is this, Socrates!

Education and admonition commence in the first years of childhood, and last to the very end of life. Mother and nurse and father and tutor are vying with one another about the improvement of the child as soon as ever he is able to understand what is being said to him: he cannot say or do anything without their setting forth to him that this is just and that is unjust; this is honourable, that is dishonourable; this is holy, that is unholy; do this and abstain from that. And if he obeys, well and good; if not, he is straightened by threats and blows, like a piece of bent or warped wood. At a later stage they send him to teachers, and enjoin them to see to his manners even more than to his reading and music; and the teachers do as they are desired. And when the boy has learned his letters and is beginning to understand what is written, as before he understood only what was spoken, they put into his hands the works of great poets, which he reads sitting on a bench at school; in these are contained many admonitions, and many tales, and praises, and encomia of ancient famous men, which he is required to learn by heart, in order that he may imitate or emulate them and desire to become like them. Then, again, the teachers of the lyre take similar care that their young disciple is temperate and gets into no mischief; and when they have taught him the use of the lyre, they introduce him to the poems of other excellent poets, who are the lyric poets; and these they set to music, and make their harmonies and rhythms quite familiar to the children's souls, in order that they may learn to be more gentle, and harmonious, and rhythmical, and so more fitted for speech and action; for the life of man in every part has need of harmony and rhythm. Then they send them to the master of gymnastic, in order that their bodies may better minister to the virtuous mind, and that they may not be compelled through bodily weakness to play the coward in war or on any other occasion. This is what is done by those who have the means, and those who have the means are the rich; their children begin to go to school soonest and leave off latest. When they have done with masters, the state again compels them to learn the laws, and live after the pattern which they furnish, and not after their own fancies; and just as in learning to write, the writing-master first draws lines with a style for the use of the young beginner, and gives him the tablet and makes him follow the lines, so the city draws the laws, which were the invention of good lawgivers living in the olden time; these are given to the young man, in order to guide him in his conduct whether he is commanding or obeying; and he who transgresses them is to be corrected, or, in other words,

called to account, which is a term used not only in your country, but also in many others, seeing that justice calls men to account. Now when there is all this care about virtue private and public, why, Socrates, do you still wonder and doubt whether virtue can be taught? Cease to wonder, for the opposite would be far more surprising.

Now I, Protagoras, want to ask of you a little question, which if you will only answer, I shall be quite satisfied. You were saying that virtue can be taught;—that I will take upon your authority, and there is no one to whom I am more ready to trust. But I marvel at one thing about which I should like to have my mind set at rest. You were speaking of Zeus sending justice and reverence to men; and several times while you were speaking, justice, and temperance, and holiness, and all these qualities, were described by you as if together they made up virtue. Now I want you to tell me truly whether virtue is one whole, of which justice and temperance and holiness are parts; or whether all these are only the names of one and the same thing: that is the doubt which still lingers in my mind.

There is no difficulty, Socrates, in answering that the qualities of which you are speaking are the parts of virtue which is one.

And are they parts, I said, in the same sense in which mouth, nose, and eyes, and ears, are the parts of a face; or are they like the parts of gold, which differ from the whole and from one another only in being larger or smaller?

I should say that they differed, Socrates, in the first way; they are related to one another as the parts of a face are related to the whole face.

And do men have some one part and some another part of virtue? Or if a man has one part, must he also have all the others?

By no means, he said; for many a man is brave and not just, or just and not wise.

You would not deny, then, that courage and wisdom are also parts of virtue?

Most undoubtedly they are, he answered; and wisdom is the noblest of the parts.

FROM *Laws*, BOOK I

Ath. . . . if I tell you what are my notions of education, will you consider whether they satisfy you?

Cle. Let us hear.

Ath. According to my view, any one who would be good at anything must practise that thing from his youth upwards, both in sport and earnest, in its several branches: for example, he who is to be a good builder, should play at building children's houses; he who is to be a good husbandman, at tilling the ground; and those who have the care of their education should provide them when young with mimic tools. They should learn beforehand the knowledge which they will afterwards require for their art. For example, the future carpenter should learn to measure or apply the line in play; and the future warrior should learn riding, or some other exercise, for amusement, and the teacher should endeavour to direct the children's inclinations and pleasures, by the help of amusements, to their final aim in life. The most important part of education is right training in the nursery.

The soul of the child in his play should be guided to the love of that sort of excellence in which when he grows up to manhood he will have to be perfected. Do you agree with me thus far?

Cle. Certainly.

Ath. Then let us not leave the meaning of education ambiguous or ill-defined. At present, when we speak in terms of praise or blame about the bringing-up of each person, we call one man educated and another uneducated, although the uneducated man may be sometimes very well educated for the calling of a retail trader, or of a captain of a ship, and the like. For we are not speaking of education in this narrower sense, but of that other education in virtue from youth upwards, which makes a man eagerly pursue the ideal perfection of citizenship, and teaches him how rightly to rule and how to obey. This is the only education which, upon our view, deserves the name; that other sort of training, which aims at the acquisition of wealth or bodily strength, or mere cleverness apart from intelligence and justice, is mean and illiberal, and is not worthy to be called education at all. But let us not quarrel with one another about a word, provided that the proposition which has just been granted hold good: to wit, that those who are rightly educated generally become good men. Neither must we cast a slight upon education, which is the first and fairest thing that the best of men can ever have, and which, though liable to take a wrong direction, is capable of reformation. And this work of reformation is the great business of every man while he lives.

Cle. Very true; and we entirely agree with you.

[*The Basic Works of Aristotle*, Edited by Richard McKeon, Random House, 1941]

SPECIALIZATION AND THE GENERAL ABILITY TO JUDGE

By Aristotle

(384–322 B.C.)

FROM *De Partibus Animalium* (*On the Parts of Animals*), Bk. I

Every systematic science, the humblest and the noblest alike, seems to admit of two distinct kinds of proficiency; one of which may be properly called scientific knowledge of the subject, while the other is a kind of educational acquaintance with it. For an educated man should be able to form a fair off-hand judgment as to the goodness or badness of the method used by a professor in his exposition. To be educated is in fact to be able to do this; and even the man of universal education we deem to be such in virtue of his having this ability. It will, however, of course, be understood that we only ascribe universal education to one who in his own individual person is thus critical in all or nearly all branches of knowledge, and not to one who has a like ability merely in some special subject. For it is possible for a man to have this competence in some one branch of knowledge without having it in all.

FROM *Politica* (*Politics*), БК. III, Ч. 11

. . . the popular form of government involves certain difficulties. In the first place, it might be objected that he who can judge of the healing of a sick man would be one who could himself heal his disease, and make him whole—that is, in other words, the physician; and so in all professions and arts. As, then, the physician ought to be called to account by physicians, so ought men in general to be called to account by their peers. But physicians are of three kinds:—there is the ordinary practitioner, and there is the physician of the higher class, and thirdly the intelligent man who has studied the art: in all arts there is such a class; and we attribute the power of judging to them quite as much as to professors of the art. Secondly, does not the same principle apply to elections? For a right election can only be made by those who have knowledge; those who know geometry, for example, will choose a geometrician rightly, and those who know how to steer, a pilot; and, even if there be some occupations and arts in which private persons share in the ability to choose, they certainly cannot choose better than those who know. So that, according to this argument, neither the election of magistrates, nor the calling of them to account, should be entrusted to the many. Yet possibly these objections are to a great extent met by our old answer, that if the people are not utterly degraded, although individually they may be worse judges than those who have special knowledge—as a body they are as good or better. Moreover, there are some arts whose products are not judged of solely, or best, by the artists themselves, namely those arts whose products are recognized even by those who do not possess the art; for example, the knowledge of the house is not limited to the builder only; the user, or, in other words, the master, of the house will even be a better judge than the builder, just as the pilot will judge better of a rudder than the carpenter, and the guest will judge better of a feast than the cook.

[The Holy Bible (Moffatt Translation)]

OF WISDOM AND STATESMANSHIP

From *Proverbs*

(c. 350–180 B.C.)

With wisdom did the Eternal
 found the earth,
 with knowledge did he raise
 the heavens;
 'twas with intelligence he broke
 up the abyss
 and made the clouds drop dew . . .

Choose instruction rather than
 silver,
 and knowledge rather than
 rare gold;
 for wisdom is better than rubies,
 no treasure is equal to her.

I Wisdom have intelligence in
 hand,
 knowledge and insight I com-
 mand . . .
 counsel and skill are mine,
 I possess mind and might.
 It is by me that monarchs reign,
 and rulers deal out justice,
 by me that great men govern,
 and magnates rule the earth . . .

For lack of statesmanship, a
 nation sinks:
 the saving of it is a wealth of
 counsellors . . .

When no one is consulted, plans
 are foiled:
 when many are consulted,
 they succeed . . .

A man who listens to healthy
 reproof
 will rank among wise men.
 He wrongs himself who will not
 be set right,
 but he who listens to reproof
 gains sense . . .

Wise men are better than war-
 riors,
 brain is better than brawn;
 for you need policy in war:
 what saves the state is many
 a counsellor . . .

[The Holy Bible (Moffatt Translation)]

ON THE STUDY OF WISDOM

From *Ecclesiastes*

(c. 200–100 B.C.)

I thought to
 become wise, but wisdom re-
 mained out of reach. Reality
 is beyond my grasp; deep it lies,
 very deep, and no one can lay
 hands upon the heart of things. . .

When I gave my mind to the
 study of wisdom, to study all
 the busy life of the world, I
 found that man is unable to
 grasp the truth of all that God
 does in this world; he may

labour in his efforts to attain it, in a sleepless quest for it by day and night, but he will never find it out; a wise man may think he is coming on the secret, but even he will never find it out. . . .

I looked at life again: in this world the race is not won by the swift, nor battles by the brave, nor bread by the wise, nor wealth by the clever, nor honour by the learned; death and misfortune happen to them all. For no man knows his hour; like fish caught in the deadly net, like birds trapped in a snare, so men are snared by an evil hour that drops upon them suddenly.

Here is another case of wisdom which I have seen on earth, and I was struck by it. A little town there was, with few men in it; and a great king attacked it, he invested it, and built great siegeworks around it. However, a poor wise man was found within the town, who saved it by his skill. And not a soul remembered that poor man! Wisdom is better than strength, I reflected; still, a poor man's wisdom wins no honour or deference for him.

Wise words heard in quiet far
excel

shouts from a ringleader of
revellers.

Wisdom is better than weapons
of war:

often a single error spoils good
strategy.

A poisonous fly makes perfume
putrid:

a grain of folly mars wisdom
and honour.

A wise man's sense will keep
him right:

a fool's mind leads him wrong.

Even on a walk the fool shows
 lack of sense,
 for he calls everyone a fool.
 If a ruler's wrath flares up
 against you,
 do not resign your post;
 defer to him,
 and you will pacify his
 rage.

Here is an evil I have seen on
 earth,
 a ruler blundering without
 meaning it:
 fools often get high posts from
 him,
 while the noble have a lowly
 seat;
 so have I seen slaves on horse-
 back,
 and princes plodding afoot
 like slaves.

He who digs a pit may fall into it,
 he who breaks a wall down
 may be bitten by a serpent.
 He who quarries stones may be
 hurt by them,
 he who cuts logs may get a
 wound.

If the axe is blunt and its edge
 unwhetted,
 more strength must be put
 into the blow;
 successful skill comes from
 shrewd sense.

If a serpent bites before it is
 charmed,
 then the charmer's skill is
 useless. . .

A wise
 man's words are like goads, and
 his collected sayings are like
 nails driven home; they put the
 mind of one man into many a
 life. My son, avoid anything
 beyond the scriptures of wis-
 dom; there is no end to the buy-
 ing of books, and to study books
 closely is a weariness to the
 flesh.

[From "The Fables of Panchatantra", *The Wisdom of China and India*, Edited by Lin Yutang, Random House, 1942]

THE LION-MAKERS

(c. Second Century B.C.)

IN A CERTAIN TOWN were four Brahmans who lived in friendship. Three of them had reached the far shore of all scholarship, but lacked sense. The other found scholarship distasteful; he had nothing but sense.

One day they met for consultation. "What is the use of attainments," said they, "if one does not travel, win the favor of kings, and acquire money? Whatever we do, let us all travel."

But when they had gone a little way, the eldest of them said: "One of us, the fourth, is a dullard, having nothing but sense. Now nobody gains the favorable attention of kings by simple sense without scholarship. Therefore we will not share our earnings with him. Let him turn back and go home."

Then the second said: "My intelligent friend, you lack scholarship. Please go home." But the third said: "No, no. This is no way to behave. For we have played together since we were little boys. Come along, my noble friend. You shall have a share of the money we earn."

With this agreement they continued their journey, and in a forest they found the bones of a dead lion. Thereupon one of them said: "A good opportunity to test the ripeness of our scholarship. Here lies some kind of creature, dead. Let us bring it to life by means of the scholarship we have honestly won."

Then the first said: "I know how to assemble the skeleton." The second said: "I can supply skin, flesh, and blood." The third said: "I can give it life."

So the first assembled the skeleton, the second provided skin, flesh, and blood. But while the third was intent on giving the breath of life, the man of sense advised against it, remarking: "This is a lion. If you bring him to life, he will kill every one of us."

"You simpleton!" said the other, "it is not I who will reduce scholarship to a nullity." "In that case," came the reply, "wait a moment, while I climb this convenient tree."

When this had been done, the lion was brought to life, rose up, and killed all three. But the man of sense, after the lion had gone elsewhere, climbed down and went home.

"And that is why I say:

Scholarship is less than sense;
Therefore seek intelligence:
Senseless scholars in their pride
Made a lion; then they died."

[From "Caesar", *Plutarch's Lives* (Dryden Translation), Great Books Series, Encyclopaedia Britannica, Inc.]

CAESAR AND SYSTEMS STUDIES

By Plutarch

(c. 46–120 A.D.)

Caesar was born to do great things, and had a passion after honour, and the many noble exploits he had done did not now serve as an inducement to him to sit still and reap the fruit of his past labours, but were incentives and encouragements to go on, and raised in him ideas of still greater actions, and a desire of new glory, as if the present were all spent. . . . he proposed to dig through the isthmus on which Corinth stands; and appointed Anienus to superintend the work. He had also a design of diverting the Tiber, and carrying it by a deep channel directly from Rome to Circeii, and so into the sea near Terracina, that there might be a safe and easy passage for all merchants who traded to Rome. Besides this, he intended to drain all the marshes by Pomentium and Setia, and gain ground enough from the water to employ many thousands of men in tillage. He proposed further to make great mounds on the shore nearest Rome, to hinder the sea from breaking in upon the land, to clear the coast at Ostia of all the hidden rocks and shoals that made it unsafe for shipping, and to form ports and harbours fit to receive the large number of vessels that would frequent them.

These things were designed without being carried into effect; but his reformation of the calendar in order to rectify the irregularity of time was not only projected with great scientific ingenuity, but was brought to its completion, and proved of very great use. For it was not only in ancient time that the Romans had wanted a certain rule to make the revolutions of their months fall in with the course of the year, so that their festivals and solemn days for sacrifice were removed by little and little, till at last they came to be kept at seasons quite the contrary to what was at first intended, but even at this time the people had no way of computing the solar year; only the priests could say the time, and they, at their pleasure, without giving any notice, slipped in the intercalary month, which they called Mercedonius. Numa was the first who put in this month, but his expedient was but a poor one and quite inadequate to correct all the errors that arose in the returns of the annual cycles. . . .

Caesar called in the best philosophers and mathematicians of his time to settle the point, and out of the systems he had before him formed a new and more exact method of correcting the calendar, which the Romans use to this day, and seem to succeed better than any nation in avoiding the errors occasioned by the inequality of the cycles. . . .

[From *The Discourses of Niccolò Machiavelli*, Vol. One (Walker Translation),
Routledge & Kegan Paul, London, 1950]

ON GIVING ADVICE

By Niccolò Machiavelli

(1469–1527)

*What Dangers are run by one who takes the Lead in advising
some Course of Action; and how much greater are the
Dangers incurred when the Course of Action
is Unusual*

How dangerous it is to take the lead in a new enterprise in which many will be concerned, and how difficult it is to handle and direct it, and should one be entrusted with it, to keep it going, would be too long and too deep a topic for us to discuss here. Reserving it, therefore, for a more convenient place, I shall here speak only of the dangers incurred by citizens or by those advising a prince, who take the lead in some grave and important matter in such a way that for the whole of this advice they may be held responsible. For men judge of actions by the result. Hence for all the ill that results from an enterprise the man who advised it is blamed, and, should the result be good, is commended; but the reward by no means weighs the same as the loss.

The present Sultan, Selim, called the Great Turk, had—according to those who have lately returned from his dominions—made preparations to invade Syria and Egypt, when he was strongly advised by one of his pashas whom he had posted on the frontiers of Persia, to attack the Sophy. Acting on this advice, he set forth on the enterprise with a very large force. On reaching a broad expanse of open country where there were many deserts but few streams, he found himself in the very difficulty that had proved fatal to many a Roman army; so much so that, though he was victorious in the war, he lost through famine and pestilence the greater part of his troops. Hence he was angry with the person who had advised him, and put him to death . . .

The advisers of a republic and the counsellors of a prince are undoubtedly in a difficult position; for, unless they recommend the course which in their honest opinion will prove advantageous to that republic or to that prince regardless of consequences, they fail to fulfil the duties of their office, while, if they recommend it, they are risking their lives and endangering their position, since all men in such matters are blind and judge advice to be good or bad according to its result. Nor do I see any way of avoiding either the infamy or the danger other than by putting the case with moderation instead of trying to force its adoption, and by stating one's views dispassionately and defending them alike dispassionately and modestly; so that, if the republic or the prince accepts your advice, he does so of his own accord, and will not seem to have been driven to it by your importunity. When you act thus, it is unreasonable for a prince or a people to wish you ill on account of your advice, since it has not been adopted against the will of the majority. Danger is incurred only when many have opposed you, and, the result being

unfortunate, they combine to bring about your downfall. And, though, in the case we have taken, there is lacking the glory which comes to the man who in opposition to the many, alone advocates a certain course which turns out well, it has two advantages. First, it does not entail danger. Secondly, if you tender your advice with modesty, and the opposition prevents its adoption, and, owing to someone else's advice being adopted, disaster follows, you will acquire very great glory. And, though you cannot rejoice in the glory that comes from disasters which befall your country or your prince, it at any rate counts for something.

I do not think any further recommendations can be made on this point, for, if one recommended men to be silent and not to express their views, this would be no use to the republic or to their prince; nor would danger thereby be eliminated, for before long they would become suspect, and that might happen which happened to some friends of Perseus, king of Macedonia. He had been defeated by Paulus Aemilius, and had escaped with a few of his friends. While they were reviewing what had taken place, it happened that one of them began to tell Perseus of the many mistakes he had made, and how they had been the cause of his undoing. At which Perseus was so annoyed that he said: 'Traitor, aren't you ashamed to speak now of what I cannot undo?' On saying which, he killed him with his own hands. Thus was a man punished for keeping silent when he ought to have spoken, and for speaking when he ought to have been silent; so that you don't avoid danger by not giving your advice. Hence it is best, I think, to keep to, and to act on, the lines laid down above.

[Essay 20, *Essays and New Atlantis* by Francis Bacon, Walter J. Black, Inc., 1942]

OF COUNSEL

By Francis Bacon

(1612)

The greatest trust between man and man is the trust of giving counsel; for in other confidences men commit the parts of life, their lands, their goods, their children, their credit, some particular affair; but to such as they make their counsellors they commit the whole; by how much the more they are obliged to all faith and integrity. The wisest princes need not think it any diminution to their greatness, or derogation to their sufficiency to rely upon counsel. God himself is not without, but hath made it one of the great names of his blessed Son, *The Counsellor*.¹ Solomon hath pronounced that, *in counsel is stability*.² Things will have their first or second agitation: if they be not tossed upon the arguments of counsel, they will be tossed upon the waves of fortune, and be full of inconstancy, doing and undoing, like the reeling of a drunken man. Solomon's son³ found the force of counsel,

¹ *Isalah*, 9 : 6.

² *Proverbs*, 20 : 18.

³ Rehoboam, from whom the ten tribes of Israel revolted, and elected Jerobam their king. See *I Kings*, 12.

as his father saw the necessity of it; for the beloved kingdom of God was first rent and broken by ill counsel; upon which counsel there are set for our instruction the two marks whereby bad counsel is forever best discerned, that it was young counsel for the persons, and violent counsel for the matter.

The ancient times do set forth in figure both the incorporation and inseparable conjunction of counsel with kings, and the wise and politic use of counsel by kings; the one, in that they say Jupiter did marry Metis, which signifieth counsel; whereby they intend that sovereignty is married to counsel; the other in that which followeth, which was thus: they say, after Jupiter was married to Metis, she conceived by him and was with child; but Jupiter suffered her not to stay till she brought forth, but eat her up; whereby he became himself with child, and was delivered of Pallas armed, out of his head. Which monstrous fable containeth a secret of empire, how kings are to make use of their council of state; that first, they ought to refer matters unto them, which is the first begetting or impregnation; but when they are elaborate, molded, and shaped in the womb of their counsel, and grow ripe and ready to be brought forth, that then they suffer not their council to go through with the resolution and direction, as if it depended on them; but take the matter back into their own hands, and make it appear to the world that the decrees and final directions (which, because they come forth with prudence and power, are resembled to Pallas armed), proceeded from themselves; and not only from their authority, but (the more to add reputation to themselves) from their head and device.

Let us now speak of the inconveniences of counsel, and of the remedies. The inconveniences that have been noted in calling and using counsel are three: first, the revealing of affairs, whereby they become less secret; secondly, the weakening of the authority of princes, as if they were less of themselves; thirdly, the danger of being unfaithfully counselled, and more for the good of them that counsel than of him that is counselled; for which inconveniences, the doctrine of Italy, and practice of France, in some kings' times, hath introduced cabinet councils; a remedy worse than the disease.

As to secrecy, princes are not bound to communicate all matters with all counsellors, but may extract and select; neither is it necessary that he that consulteth what he should do, should declare what he will do; but let princes beware that the unsecreting of their affairs comes not from themselves; and, as for cabinet councils, it may be their motto, *I am full of leaks*; ⁴ one futile person, that maketh it his glory to tell, will do more hurt than many that know it their duty to conceal. It is true, there be some affairs which require extreme secrecy, which will hardly go beyond one or two persons besides the king. Neither are those counsels unprosperous; for, besides the secrecy, they commonly go on constantly in one spirit of direction without distraction; but then it must be a prudent king, such as is able to grind with a handmill; ⁵ and those inward counsellors had need also to be wise men, and especially true and trusty to the king's ends; as it was with King Henry

⁴ *Plenus rimarum sum*. Terence, *Eunuchus*, I, ii, 25.

⁵ That is, without complicated machinery of government.

the Seventh of England, who, in his greatest business, imparted himself to none, except it were to Morton ⁶ and Fox.⁷

For weakening of authority, the fable ⁸ showeth the remedy; nay, the majesty of kings is rather exalted than diminished when they are in the chair of council; neither was there ever prince bereaved of his dependencies by his council, except where there hath been either an over-greatness in one counsellor, or an over-strict combination in divers, which are things soon found and holpen.⁹

For the last inconvenience, that men will counsel with an eye to themselves; certainly, *he shall not find faith upon the earth*,¹⁰ is meant of the nature of times, and not of all particular persons. There be that are in nature faithful and sincere, and plain and direct, not crafty and involved: let princes, above all, draw to themselves such natures. Besides, counsellors are not commonly so united, but that one counsellor keepeth sentinel over another; so that if any do counsel out of faction or private ends, it commonly comes to the king's ear; but the best remedy is, if princes know their counsellors, as well as their counsellors know them: *The greatest virtue of a prince is to know his own*.¹¹ And on the other side, counsellors should not be too speculative into their sovereign's person. The true composition of a counsellor is, rather to be skillful in their master's business than in his nature; for then he is like to advise him, and not to feed his humor. It is of singular use to princes, if they take the opinions of their council both separately and together; for private opinion is more free, but opinion before others is more reverend. In private, men are more bold in their own humors; and in consort, men are more obnoxious ¹² to others' humors; therefore it is good to take both; and of the inferior sort rather in private, to preserve freedom; of the greater, rather in consort, to preserve respect. It is in vain for princes to take counsel concerning matters, if they take no counsel likewise concerning persons; for all matters are as dead images; and the life of the execution of affairs resteth in the good choice of persons. Neither is it enough to consult concerning persons, *according to classes*,¹³ as in an idea or mathematical description, what the kind and character of the person should be; for the greatest errors are committed, and the most judgment is shown, in the choice of individuals. It was truly said, *The best counsellors are the dead*; ¹⁴ *books will speak plain when counsellors blanch*; therefore it is good to be conversant in them, specially the books of such as themselves have been actors upon the stage.

The councils at this day in most places are but familiar meetings, where matters are rather talked on than debated; and they run too swift to the order or act of council. It were better that in causes of weight, the matter were propounded one day and not spoken to till the next day; *Night is the season for counsel*; ¹⁵ so was it done in the

⁶ John Morton, Archbishop of Canterbury.

⁷ Richard Fox, Bishop of Winchester.

⁸ Before mentioned, relative to Jupiter and Metis.

⁹ Remedied.

¹⁰ *Non inveniet fidem super terram*. Bacon probably alludes to the words of Jesus, "When the son of Man cometh, shall he find faith upon the earth?" Luke, 18:8.

¹¹ *Principis est virtus maxima nosse suos*. Martial, *Epigrams*, VIII, 15, 8.

¹² Subject to or exposed to.

¹³ *Secundum genera*.

¹⁴ *Optimi consillarū mortui*.

¹⁵ *In nocte consilium*.

commission of union ¹⁶ between England and Scotland, which was a grave and orderly assembly. I commend set days for petitions; for both it gives the suitors more certainty for their attendance, and it frees the meetings for matters of estate, that they may *attend to the business in hand*.¹⁷ In choice of committees for ripening business for the council, it is better to choose indifferent persons, than to make an indifferency by putting in those that are strong on both sides. I commend, also, standing commissions; as for trade, for treasure, for war, for suits, for some provinces; for where there be divers particular councils, and but one council of estate (as it is in Spain), they are in effect no more than standing commissions, save that they have greater authority. Let such as are to inform councils out of their particular professions (as lawyers, seamen, mintmen, and the like) be first heard before committees; and then, as occasion serves, before the council; and let them not come in multitudes, or in a tribunitious ¹⁸ manner; for that is to clamor councils, not to inform them. A long table and a square table, or seats about the walls, seem things of form, but are things of substance; for at a long table a few at the upper end, in effect, sway all the business; but in the other form there is more use of the counsellors' opinions that sit lower. A king, when he presides in council, let him beware how he opens his own inclination too much in that which he propoundeth; for else counsellors will but take the wind of him, and, instead of giving free counsel, will sing him a song of *I shall please*.¹⁹

[From "A Rough Draught of a New Model at Sea, 1694", *The Complete Works of George Savile*, Edited by Walter Raleigh, Oxford, The Clarendon Press, 1912]

THE GENTLEMEN AND THE TARPAULINS

By George Savile

I will make no other Introduction to the following Discourse, than that as the Importance of our being strong at *Sea*, was ever very great, so in our present Circumstances it is grown to be much greater; because, as formerly our Force of Shipping contributed greatly to our *Trade* and Safety, so now it is become indispensibly necessary to our very *Being*.

It may be said now to *England, Martha, Martha*, thou art busy about many things, but one thing is necessary. To the Question, What shall we do to be saved in this World? there is no other Answer but this, Look to your Moate. . . .

It is not pretended to launch into such a Voluminous Treatise, as to set down every thing to which so comprehensive a Subject might lead me; for as the Sea hath little less variety in it than the Land; so the Naval Force of *England* extendeth it self into a great many Branches, each of which are important enough to require a Discourse apart, and peculiarly applied to it: But there must be preference to some Con-

¹⁶ On the accession of James VI of Scotland to the throne of England in 1603.

¹⁷ *Hoc agere*.

¹⁸ Declamatory.

¹⁹ Quoted in jest from Psalm 114:9 in the Vulgate: *Placebo Domino in regione vivorum*.

siderations above others, when the weight of them is so visibly Superior that it cannot be contested. It is there, first, that the Foundations are to be laid of our Naval Oeconomy; amongst these, there is one Article which in its own Nature must be allowed to be the Corner-stone of the Building: the Choice of *Officers*, with the *Discipline* and *Encouragement* belonging to them. Upon this Head only, I shall then take the liberty to venture my Opinion into the World, with a real Submission to those, who may offer any thing better for the advantage of the *Publick*.

The first Question then will be, Out of what sort of Men the *Officers* of the *Fleet* are to be chosen; and this immediately leadeth us to the present Controversy between the *Gentlemen* and the *Tarpaulins*. . . .

To state the thing impartially, it must be owned that it seemeth to lye fairest for the *Tarpaulin*: It giveth an Impression that must have so much weight as to make a Man's Opinion lean very much on that side, it carrieth so much Authority with it, it seemeth to be so unquestionable, that those are fittest to Command at Sea, who have not only made it their *Calling*, but their *Element*; that there must naturally be a prejudice to any thing then can be said against it. There must therefore be some Reason extraordinary to support the Argument on the other side, or else the Gentlemen could never enter the Lists against such a violent Objection, which seemeth not to be resisted. I will introduce my Argument with an Assertion, which as I take to be true almost in all Cases, so it is necessary to be explained and enforced in this. The *Assertion* is, that there is hardly a single Proposition to be made, which is not deceitful, and the tying our Reason too close to it, may in many Cases be destructive. Circumstances must come in, and are to be made a part of the Matter of which we are to judge; positive *Decisions* are always dangerous, more especially in *Politicks*. A Man, who will be Master of an Argument, must do like a skilful General, who sendeth Scouts on all sides, to see whether there may not be an Enemy. So he must look round to see what Objections can be made, and not go on in a streight Line, which is the ready way to lead him into a mistake.

Before then, that we conclude what sort of Men are fittest to Command at Sea, a Principle is to be laid down, that there is a differing Consideration to be had of such a Subject-matter, as is in it self distinct and independent, and of such an one as being a Limb of a Body, or a Wheel of a Frame, there is a necessity of suiting it to the rest, and preserving the Harmony of the whole. A Man must not in that Case restrain himself to the separate Consideration of that single Part, but must take care it may fall in and agree with the Shape of the whole Creature, of which it is a Member. According to this Proposition, which I take to be indisputable, it will not I hope appear an Affectation, or an extravagant Fit of unseasonable *Politicks*, if, before I enter into the particular State of the present Question, I say something of the Government of *England*, and make that the Groundwork of what sort of Men are most proper to be made use of to Command at Sea.

The Forms of Government to which *England* must be subjected, are either *Absolute Monarchy*, a *Commonwealth*, or a *Mixt Monarchy*, as it is now. . . .

I will not say, that there is never to be any Alteration; the Constitution of the several Parts that concur to make up the Frame of the present Government may be altered in many things, in some for the better, and in others, perhaps for the worse, according as Circumstances shall arise to induce a *Change*, and as Passion and Interest shall have more or less Influence upon the Publick Councils; but still, if it remaineth in the whole so far a *mixt Monarchy*, that there shall be a restraint upon the *Prince* as to the Exercise of a *Despotick Power*, it is enough to make it a Groundwork for the present Question. It appeareth then that a *bounded Monarchy* is that kind of Government which will most probably prevail and continue in *England*; from whence it must follow (as hath been hinted before) that every considerable Part ought to be so composed, as the better to conduce to the preserving the Harmony of the whole Constitution. The *Navy* is of so great Importance, that it would be disparaged by calling it less than the *Life and Soul* of Government.

Therefore to apply the Argument to the Subject we are upon; in case the *Officers* be all *Tarpaulins*, it would be in reality too great a tendency to a *Commonwealth*; such a part of the Constitution being *Democratically* disposed may be suspected to endeavour to bring it into that Shape; and where the influence must be so strong, the Supposition will be the more justifiable. In short, if the *Maritime Force*, which is the only thing that can defend us, should be wholly directed by the lower sort of Men, with an intire Exclusion of the *Nobility* and *Gentry*, it will not be easy to answer the Arguments supported by so great a probability, that such a Scheme would not only lean toward a *Democracy*, but directly lead us into it.

Let us now examine the contrary Proposition, *viz. that all Officers should be Gentlemen.*

Here the Objection lieth so fair, of its introducing an *Arbitrary Government*, that it is as little to be answered in that respect, as the former is in the other. *Gentlemen* in a general Definition, will be suspected to lie more than other Men under the Temptations of being made Instruments of unlimited Power; their Relations, their Way of Living, their Tast of the Entertainments of the *Court*, inspire an Ambition that generally draweth their Inclinations toward it, besides the gratifying of their Interests. Men of Quality are often taken with the Ornaments of Government, the Splendor dazleth them so, as that their Judgements are surprised by it; and there will be always some that have so little remorse for invading other Mens Liberties, that it maketh them less solicitous to preserve their own.

These things throw them naturally into such a dependance as might give a dangerous Biass; if they alone were in Command at Sea, it would make that great Wheel turn by an irregular Motion, and instead of being the chief means of preserving the whole Frame, might come to be the chief Instruments to discompose and dissolve it.

The two former exclusive Propositions being necessarily to be excluded in this Question, there remaineth no other Expedient, neither can any other Conclusion be drawn from the Argument as it hath been stated, than that there must be a mixture in the Navy of *Gentlemen*

and *Tarpaulins*, as there is in the Constitution of the Government, of *Power* and *Liberty*. This Mixture is not to be so rigorously defined, as to set down the exact Proportion there is to be of each; the greater or lesser Number must be directed by Circumstances, of which the Government is to Judge, and which make it improper to set such Bounds, as that upon no occasion it shall on either side be lessened or enlarged. It is possible the Men of *Wapping* may think they are injured, by giving them any Partners in the Dominion of the *Sea*; they may take it unkindly to be jostled in their own *Element* by Men of such a different Education, that they may be said to be of another Species; they will be apt to think it an Usurpation upon them, and notwithstanding the Instances that are against them, and which give a kind of Prescription on the other side, they will not easily acquiesce in what they conceive to be a hardship to them.

But I shall in a good measure reconcile myself to them by what follows; *viz.* The *Gentlemen* shall not be capable of bearing Office at *Sea*, except they be *Tarpaulins* too; that is to say, except they are so trained up by a continued habit of living at *Sea*, that they may have a Right to be admitted free *Denizens* of *Wapping*. Upon this dependeth the whole Matter; and indeed here lieth the difficulty, because the *Gentlemen* brought up under the Connivance of a looser Discipline, and of an easier admittance, will take it heavily to be reduced within the *Fetters* of such a *New Model*; and I conclude, they will be so extremely averse to that which they call an unreasonable Yoke upon them, that their Original Consent is never to be expected. But if it appeareth to be convenient, and which is more, that it is necessary for the Preservation of the whole, that it should be so; the Government must be call'd in Aid to suppress these first Boilings of Discontent; the Rules must be imposed with such Authority, and the Execution of them must be so well supported, that by degrees their Impatience will be subdued, and they will concur in an Establishment to which they will every day be more reconciled.

They will find it will take away the Objections which are now thrown upon them, of setting up for Masters without having ever been Apprentices; or at least, without having served out their Time.

Mankind naturally swelleth against Favour and Partiality; their belief of their own Merit maketh Men object them to a prosperous Competitor, even when there is no pretence for it; but when there is the least handle offered, to be sure it will be taken. So, in this Case, when a *Gentleman* is preferr'd at *Sea*, the *Tarpaulin* is very apt to impute it to Friend or Favour: But if that *Gentleman* hath before his Preferment passed through all the Steps which lead to it, so that he smelleth as much of *Pitch* and *Tar*, as those that were *Swaddled* in *Sail-Cloath*; his having an *Escutcheon* will be so far from doing him harm, that it will set him upon the advantage Ground: It will draw a real Respect to his Quality when so supported, and give him an Influence and Authority infinitely superior to that which the *meer Seaman* can ever pretend to.

When a *Gentleman* hath learned how to *Obey*, he will grow very much fitter to *Command*; his own Memory will advise him not to inflict too rigorous Punishments. He will better resist the Temptations

of Authority (which are great) when he reflecteth how much he hath at other times wished it might be gently exercised, when he was liable to the Rigour of it.

When the undistinguish'd *Discipline* of a Ship hath tamed the young Mastership, which is apt to arise from a *Gentleman's* Birth and Education, he then groweth Proud in the right place, and valueth himself first upon knowing his Duty, and then upon doing it.

In plain *English*, Men of *Quality* in their several Degrees must either restore themselves to a better Opinion, both for *Morality* and *Diligence*, or else *Quality* it self will be in danger of being extinguished.

The Original *Gentleman* is almost lost in strictness; when Posterity doth not still further adorn by their Virtue the Escutcheon their Ancestors first got for them by their Merit, they deserve the Penalty of being deprived of it.

To expect that *Quality* alone should waft Men up into *Places* and *Employments*, is as unreasonable, as to think that a Ship, because it is Carved and Gilded, should be fit to go to *Sea* without *Sails* or *Tackling*. But when a *Gentleman* maketh no other use of his *Quality*, than to incite him the more to his Duty, it will give such a true and settled *Superiority*, as must destroy all Competition from those that are below him. . . .

[From "An Enquiry Concerning Human Understanding" by David Hume, Great Books Series, Encyclopaedia Britannica, Inc.]

REASON AND EXPERIENCE

By David Hume

(1748)

Nothing is more useful than for writers, even, on *moral*, *political*, or *physical* subjects, to distinguish between *reason* and *experience*, and to suppose, that these species of argumentation are entirely different from each other. The former are taken for the mere result of our intellectual faculties, which, by considering *à priori* the nature of things, and examining the effects, that must follow from their operation, establish particular principles of science and philosophy. The latter are supposed to be derived entirely from sense and observation, by which we learn what has actually resulted from the operation of particular objects, and are thence able to infer, what will, for the future, result from them. Thus, for instance, the limitations and restraints of civil government, and a legal constitution, may be defended, either from *reason*, which reflecting on the great frailty and corruption of human nature, teaches, that no man can safely be trusted with unlimited authority; or from *experience* and history, which inform us of the enormous abuses, that ambition, in every age and country, has been found to make of so imprudent a confidence.

The same distinction between reason and experience is maintained in all our deliberations concerning the conduct of life; while the experienced statesman, general, physician, or merchant is trusted and followed; and the unpractised novice, with whatever natural talents endowed, neglected and despised. Though it be allowed, that reason may form very plausible conjectures with regard to the consequences of such a particular conduct in such particular circumstances; it is still supposed imperfect, without the assistance of experience, which is alone able to give stability and certainty to the maxims, derived from study and reflection.

But notwithstanding that this distinction be thus universally received, both in the active speculative scenes of life, I shall not scruple to pronounce, that it is, at bottom, erroneous, as least, superficial.

If we examine those arguments, which, in any of the sciences above mentioned, are supposed to be the mere effects of reasoning and reflection, they will be found to terminate, at last, in some general principle or conclusion, for which we can assign no reason but observation and experience. The only difference between them and those maxims, which are vulgarly esteemed the result of pure experience, is, that the former cannot be established without some process of thought, and some reflection on what we have observed, in order to distinguish its circumstances, and trace its consequences: Whereas in the latter, the experienced event is exactly and fully familiar to that which we infer as the result of any particular situation. The history of a Tiberius or a Nero makes us dread a like tyranny, were our monarchs freed from the restraints of laws and senates: But the observation of any fraud or cruelty in private life is sufficient, with the aid of a little thought, to give us the same apprehension; while it serves as an instance of the general corruption of human nature, and shows us the danger which we must incur by reposing an entire confidence in mankind. In both cases, it is experience which is ultimately the foundation of our inference and conclusion.

There is no man so young and unexperienced, as not to have formed, from observation, many general and just maxims concerning human affairs and the conduct of life; but it must be confessed, that, when a man comes to put these in practice, he will be extremely liable to error, till time and farther experience both enlarge these maxims, and teach him their proper use and application. In every situation or incident, there are many particular and seemingly minute circumstances, which the man of greatest talent is, at first, apt to overlook, though on them the justness of his conclusions, and consequently the prudence of his conduct, entirely depend. Not to mention, that, to a young beginner, the general observations and maxims occur not always on the proper occasions, nor can be immediately applied with due calmness and distinction. The truth is, an unexperienced reasoner could be no reasoner at all, were he absolutely unexperienced; and when we assign that character to any one, we mean it only in a comparative sense, and suppose him possessed of experience, in a smaller and more imperfect degree.

[From No. 53 (Hamilton or Madison), *The Federalist*, Random House]

THE LEGISLATOR AS GENERALIST

(1788)

No man can be a competent legislator who does not add to an upright intention and a sound judgment a certain degree of knowledge of the subjects on which he is to legislate. A part of this knowledge may be acquired by means of information which lie within the compass of men in private as well as public stations. Another part can only be attained, or at least thoroughly attained, by actual experience in the station which requires the use of it . . .

In a single State, the requisite knowledge relates to the existing laws, which are uniform throughout the State, and with which all the citizens are more or less conversant; and to the general affairs of the State, which lie within a small compass, are not very diversified, and occupy much of the attention and conversation of every class of people. The great theatre of the United States presents a very different scene. The laws are so far from being uniform, that they vary in every State; whilst the public affairs of the Union are spread throughout a very extensive region, and are extremely diversified by the local affairs connected with them, and can with difficulty be correctly learnt in any other place than in the central councils, to which a knowledge of them will be brought by the representatives of every part of the empire. Yet some knowledge of the affairs, and even of the laws, of all the States, ought to be possessed by the members from each of the States. How can foreign trade be properly regulated by uniform laws, without some acquaintance with the commerce, the ports, the usages, and the regulations of the different States? How can the trade between the different States be duly regulated without some knowledge of their relative situations in these and other respects? How can taxes be judiciously imposed and effectually collected, if they be not accommodated to the different laws and local circumstances relating to these objects in the different States? How can uniform regulations for the militia be duly provided, without a similar knowledge of many internal circumstances by which the States are distinguished from each other? These are the principal objects of federal legislation, and suggest most forcibly the extensive information which the representatives ought to acquire. The other interior objects will require a proportional degree of information with regard to them . . .

A branch of knowledge which belongs to the acquirements of a federal representative, and which has not been mentioned, is that of foreign affairs. In regulating our own commerce, he ought to be not only acquainted with the treaties between the United States and other nations, but also with the commercial policy and laws of other nations. He ought not to be altogether ignorant of the law of nations; for that, as far as it is a proper object of municipal legislation, is submitted to the federal government. And although the House of Representatives is not immediately to participate in foreign negotiations and arrangements, yet from the necessary connection between the several branches

of public affairs, those particular branches will frequently deserve attention in the ordinary course of legislation, and will sometimes demand particular legislative sanction and coöperation. Some portion of this knowledge may, no doubt, be acquired in a man's closet; but some of it also can only be derived from the public sources of information; and all of it will be acquired to best effect by a practical attention to the subject during the period of actual service in the legislature . . .

A few of the members, as happens in all such assemblies, will possess superior talents; will, by frequent reëlections, become members of long standing; will be thoroughly masters of the public business, and perhaps not unwilling to avail themselves of those advantages. The greater the proportion of new members, and the less the information of the bulk of the members, the more apt will they be to fall into the snares that may be laid for them.

[Golden Press, New York]

THE EMPEROR'S NEW CLOTHES

By Hans Christian Andersen

(1805-1875)

Many years ago there lived an Emperor who loved new clothes. He liked them so much he spent all his money on them.

This Emperor didn't care much about his soldiers or about going to plays and parties. He didn't even care about riding in his stately carriage, except that this gave him a chance to show off his new clothes.

The Emperor had different outfits for every hour of the day. And how he loved to try them on!

Standing in front of a large mirror, he would look at himself, from his lace-edged shirt to his golden shoes, and say approvingly, "Hmmm, very handsome indeed."

People did not talk about him as they did about other Emperors. They did not say, "He is in his council chamber." Instead they said, "He is in his dressing room."

Life was very gay in the city where the Emperor lived. People were always coming to visit and see the sights.

One day among the visitors were two swindlers who pretended to be expert weavers.

The swindlers said they would weave the most beautiful cloth in the world. Not only were the colors and patterns remarkable, they said, but the cloth itself was magic.

"In what way?" asked the Emperor.

"Ah," said the swindlers, bowing low, "it is invisible."

"To everyone?" asked the Emperor.

"That is the amazing thing," said the swindlers. "The cloth is invisible only to any person who is unfit for his job or impossibly stupid."

"What splendid cloth to have," thought the Emperor. "And how useful. If I had some of it, I could tell which people in my kingdom were unfit for their jobs. I could also separate the fools from the wise men. I must have some of that cloth at once!"

This decided, the Emperor paid the swindlers a large sum of money so they could start work immediately.

The Emperor also gave them yards of the finest silk and a huge supply of gold thread.

The swindlers set up two looms. They pretended to weave. But they didn't really weave because there was nothing on the frames.

Moreover, the swindlers stuffed all the gold thread and silk into two large bags to keep for themselves.

On into the night they worked, on empty looms, weaving nothing at all.

The next morning the Emperor thought, "I wonder how much of the cloth is finished?"

To tell the truth, he felt a little uneasy, remembering the swindlers said that anyone who could not see the cloth was either unfit for his job or a fool.

The Emperor didn't fear for himself. Still he thought it wise to check and see how things were going.

In fact, everyone in town had by now heard about the marvelous material that was being made. And everyone was anxious to find out which of his neighbors were foolish or unfit.

So the Emperor decided to send his most faithful minister. "He can tell me how the cloth looks," said the Emperor to himself, "for he is a very clever man."

The minister went into the room where the two swindlers were busy weaving nothing.

"On my life!" thought the minister, opening his eyes wide. "I don't see anything at all!"

Now the minister only thought this. He didn't say it because that would mean he was a fool or unfit to be a minister.

"Come closer," one of the swindlers said, motioning to the minister.

"How do you like the unusual pattern and the bright colors?" asked the swindler. "Don't you think it is the most beautiful cloth you have ever seen?"

The poor minister stared as hard as he could. But he couldn't see anything because there wasn't anything to see.

"Gracious," thought the minister. "Is it possible that I am a fool? I never thought so. And I certainly don't want anyone else to think so. It would never do to let them know I can't see the cloth. Oh dear, oh dear!"

While he was thinking, the other swindler asked, "Sir, you haven't said anything about the cloth. Are you displeased?"

"Why no—not at all, oh no," said the minister, shaking his head. "Truly I have never—ahem—seen such beautiful cloth. Such colors and such a rare pattern. It is most amazing.

"Now I must run and tell the Emperor. I will be sure to tell him I am pleased with what I have—er—seen."

"Glad you like it," said the swindlers, and went on in great detail about the way the material was woven and about the dyes used in the thread.

The minister listened carefully to every word so that he could repeat it to the Emperor.

The swindlers also asked for more money, more silk and more gold thread, all of which they got.

Of course, not an inch of anything was actually used. The swindlers worked, as before, on an empty loom weaving nothing.

Soon the Emperor sent a second minister to inspect the cloth and see when it would be ready.

The same thing happened to him that happened to the first minister.

He looked and looked. But all he saw was the empty loom. The loom was being worked, but there was nothing on it—not even one piece of thread.

“Lovely cloth, isn’t it?” said the first swindler, pretending to hold up a piece of the material.

As he did this, the second swindler explained all about the colors and pattern which were, of course, not to be seen.

“I know I’m not a fool,” thought the second minister, “so it must be true that I am unfit for my job. It is strange. But one thing is certain. I must not let them know I cannot see the cloth.”

So the second minister praised the weavers and raved about the wonderful material. He said the colors were perfect and the pattern was most unusual.

Then he too went back to the Emperor and reported that he had looked at the material and had never before seen anything like it.

Because of what the ministers said, everyone in town began to talk about the splendid cloth that was being made for the Emperor’s new clothes. People couldn’t wait to see it for themselves.

The Emperor couldn’t wait to see the material either. Accompanied by several members of his court and the two faithful ministers who had already seen it, he went to the weavers.

When he entered the room, the swindlers were working as hard as ever on the imaginary cloth.

“It is magnificent, don’t you agree?” said the ministers. “Look, Your Majesty, at the delightful design and the splendid colors.” They pointed to the empty air, for each thought the other could really see the material.

“Heavens!” thought the Emperor. “What can this mean? I see nothing. This is terrible. It means I am a fool and unfit to be Emperor. Why, nothing in the world could be worse than that!”

But all the Emperor said aloud was, “Why yes, it is perfectly wonderful cloth. It is very beautiful and it has my highest approval.”

The Emperor stared at the empty loom. Nothing could have made him say he couldn’t see anything.

All the members of the court stared too. None of them saw anything either. But certainly they weren’t going to admit it. So with the Emperor, they agreed that it was “very beautiful indeed.”

Everyone urged the Emperor to have a suit made of the wonderful cloth to wear during the great state procession soon to take place.

“Lovely! Splendid! Gorgeous!” were the words that went from mouth to mouth.

The Emperor was so pleased he made each of the swindlers a knight and gave him a decoration to wear in his buttonhole. He also proclaimed them “Gentlemen Weavers and Knights of the Loom.”

The weavers stayed up the whole night before the procession. They burned sixteen candles working on the imaginary cloth—so anxious was the Emperor to have everything finished on time.

The swindlers made all the proper weaving motions. They pretended to take the cloth off the loom.

Next they cut it out in the air—snip snip—with a huge pair of scissors.

Then they stitched away with needles that had no thread in them.

Finally they announced, "The Emperor's new clothes are ready."

Early in the morning the Emperor went to try on his clothes.

As he walked into the room, both swindlers raised their arms as if holding up something.

One said, "Here are Your Majesty's trousers."

The other said, "Here are your robe and mantle. See how lovely they are—light as a spider's web. The wearer of these clothes might feel as if he had nothing on, but then, that is the beauty of it."

"Yes, indeed," replied all the courtiers, who could see nothing because there was nothing to be seen.

"Your Majesty, if you will take off your old clothes," said the swindlers, "we will help you on with your new ones."

So the Emperor took off all his old clothes, down to his undershirt.

Then, piece by piece, the swindlers handed him the new garments they had pretended to make.

The Emperor carefully put his bare feet into the pretend trousers and then he put his arms into the pretend robe.

Finally the swindlers fastened the imaginary train around his shoulders, and the new outfit was complete.

"Now look at yourself," they said to the Emperor.

The Emperor turned around, slowly and with great care, in front of the large looking glass.

"How well His Majesty looks in his new clothes," cried all the courtiers. "How becoming they are. And how perfectly they fit."

Then someone said, "The canopy which is to be held over Your Majesty's head is waiting outside."

"I am ready," said the Emperor, turning around one last time in front of the mirror to make sure everything was on just right.

The minister who was to carry the train then stooped to the floor and pretended to pick up the train.

Carefully he held his hands high in the air as if holding the end of something.

And so the Emperor marched at the head of the procession under the beautiful red and gold canopy.

All the people who lined the streets and looked out of the windows cried, "Just look at the Emperor's new clothes. How beautiful they are! And what a long, lovely train!"

Not one person dared admit he couldn't see anything, because if he did, it would mean he was either stupid or unfit for his job.

None of the Emperor's other outfits—not even his most elaborate—had ever met with such complete public success.

Then suddenly a little child piped up, "But he has no clothes on!"

"Oh, listen to the silly child," said his father.

Still and all, the people started to whisper to one another that what the child said was so. "The Emperor doesn't have any clothes on. A little child is saying it and it is true."

The Emperor squirmed. All at once he knew that what the people said was right.

"All the same," he said to himself, "I must go on as long as the procession lasts."

So the Emperor kept on walking, his head held higher than ever. And the faithful minister kept on carrying the train that wasn't there.

[McGraw-Hill Book Company, New York, 1963]

THE BLIND MEN AND THE ELEPHANT

A Version of the Famous Indian Legend

By John Godfrey Saxe

(1816–1887)

It was six men of Indostan
To learning much inclined,
Who went to see the Elephant
(Though all of them were blind),
That each by observation
Might satisfy his mind.

The First approached the Elephant,
And happening to fall
Against his broad and sturdy side,
At once began to bawl:
"Bless me! but the Elephant
Is very like a wall!"

The Second, feeling of the tusk,
Cried, "Ho! what have we here,
So very round and smooth and sharp?
"To me 'tis mighty clear
This wonder of an Elephant
Is very like a spear!"

The Third approached the animal,
And happening to take
The squirming trunk within his hands,
Thus boldly up and spake:
"I see," quoth he, "the Elephant
Is very like a snake!"

The Fourth reached out his eager hand,
And felt about the knee.
"What most this wondrous beast is like
Is mighty plain," quoth he;
" 'Tis clear enough the Elephant
Is very like a tree!"

The Fifth, who chanced to touch the ear,
 Said, "E'en the blindest man
 Can tell what this resembles most;
 Deny the fact who can,
 "This marvel of an Elephant
 Is very like a fan!"

The Sixth no sooner had begun
 About the beast to grope,
 Than, seizing on the swinging tail
 That fell within his scope,
 "I see," quoth he, "the Elephant
 Is very like a rope!"

And so these men of Indostan
 Disputed loud and long,
 Each in his own opinion
 Exceeding stiff and strong,
 Though each was partly in the right,
 And all were in the wrong!

[From Introduction to *Charles Babbage and his Calculating Engines*, Dover Publications, New York, 1961]

QUANTIFYING THE UNQUANTIFIABLE?

Letter From Charles Babbage to Alfred, Lord Tennyson

(c. 1850)

Although Babbage never strayed very long from his calculating Engines, his tremendous scientific curiosity led him into many by-ways—some stemming directly from the main line of his machines, and some that were far afield . . .

He even extended his demand for statistical accuracy to poetry; it is said that he sent the following letter to Alfred, Lord Tennyson about a couplet in "The Vision of Sin":

"Every minute dies a man, / Every minute one is born": I need hardly point out to you that this calculation would tend to keep the sum total of the world's population in a state of perpetual equipoise, whereas it is a well-known fact that the said sum total is constantly on the increase. I would therefore take the liberty of suggesting that in the next edition of your excellent poem the erroneous calculation to which I refer should be corrected as follows: "Every moment dies a man / And one and a sixteenth is born." I may add that the exact figures are 1.167, but something must, of course, be conceded to the laws of metre.

[From the Report of the Secretary of War for 1902]

THE GENERAL STAFF CONCEPT

By Elihu Root

The most important thing to be done now for the Regular Army is the creation of a general staff. I beg to call attention to the remarks made upon this subject under the head of 'Improvement of Army Organization' in the report for 1899 and under the head of 'General Staff' in the report for 1901. Since the report for 1899 was made many of the important measures then recommended for the greater efficiency of the Army have been accomplished or are in course of accomplishment under authority conferred by legislation. Our military system, is, however, still exceedingly defective at the top. We have a personnel unsurpassed anywhere, and a population ready to respond to calls for the increase of personnel in case of need, up to the full limit at which it is possible to transport and subsist an Army. We have wealth and a present willingness to expend it reasonably for the procurement of supplies and material of war as plentiful and as good as can be found in any country. We have the different branches of the military service well organized, each within itself, for the performance of its duties. Our administrative staff and supply departments, as a rule, have at their heads good and competent men, faithful to their duties, each attending assiduously to the business of his department.

But when it comes to the coordination and direction of all these means and agencies of warfare, so that all parts of the machine shall work together, we are weak. Our system makes no adequate provision for the directing brain which every army must have, to work successfully. Common experience has shown that this cannot be furnished by any single man without assistants, and that it requires a body of officers working together under the direction of a chief and entirely separate from and independent of the administrative staff of an army (such as the adjutants, quartermasters, commissaries, etc., each of whom is engrossed in the duties of his own special department). This body of officers, in distinction from the administrative staff, has come to be called a general staff. There has been much misunderstanding as to the nature and duties of a general staff. Brigadier General Theodore Schwan, in his work on the organization of the German army, describes it as follows:

'In Prussia, at least, the term has been used exclusively and distinctively applied, since about 1789, to a body of officers to whom, as assistants to the commander in chief and of his subordinate generals, is confided such work as is directly connected with the designing and the execution of military operations. That in Germany, as elsewhere, chiefs of special arms, heads of supply departments, judge-advocates, etc., form an important branch of the higher commands goes without saying, but they are not included in the term general staff. Clausewitz's dictum that the general staff is intended to convert the ideas of the

commanding general into orders, not only by communicating the former to the troops but rather by working out all matters of detail, and thus relieving the general from a vast amount of unnecessary labor, is not a sufficient definition of general staff duties, according to Von Schellendorf (upon this question certainly the better authority), as it fails to notice the important obligation of the general staff officer of constantly watching over the effectiveness of the troops which would be impaired by a lack of attention to their material welfare. Out of this obligation grows, he says, the further duty of furnishing to the heads of the supply departments and other officers attached to the headquarters such explanations touching the general military situation, or the effect of a sudden change therein, as will enable them to carry out intelligently what is expected of them. The general staff thus becomes a directing and explaining body, and its chief, therefore, is in some respects the head of the whole staff. It follows, that of the two terms, staff and general staff, the Germans regard the former as the more comprehensive one and as embracing the latter.⁷

Neither our political nor our military system makes it suitable that we should have a general staff organized like the German general staff or like the French general staff; but the common experience of mankind is that the things which those general staffs do have to be done in every well managed and well directed army, and they have to be done by a body of men especially assigned to do them. We should have such a body of men selected and organized in our own way and in accordance with our own system to do those essential things. The most intelligible way to describe such a body of men, however selected and organized, is by calling it a general staff, because its duties are staff duties and are general in their character.

The duties of such a body of officers can be illustrated by taking for example an invasion of Cuba, such as we were all thinking about a few years ago. It is easy for a President or a general acting under his direction, to order that 50,000 or 100,000 men proceed to Cuba and capture Havana. To make an order which has any reasonable chance of being executed he must do a great deal more than that. He must determine how many men shall be sent and how they shall be divided among the different arms of the service, and how they shall be armed and equipped, and to do that he must get all the information possible about the defenses of the place to be captured and the strength and character and armament of the forces to be met. He must determine at what points and by what routes the place shall be approached, and at what points his troops shall land in Cuba; and for this purpose he must be informed about the various harbors of the island and the depth of their channels; what classes of vessels can enter them; what the facilities for landing are; how they can be defended; the character of the roads leading from them to the place to be attacked; the character of the intervening country; how far it is healthful or unhealthful; what the climate is liable to be at the season of the proposed movement; the temper and sympathy of the inhabitants; the quantity and kind of supplies that can be obtained, and a great variety of other things which will go to determine whether it is better to make the approach from one point or from an-

other, and to determine what it will be necessary for the Army to carry with it in order to succeed in moving and living and fighting.

All this information it is the business of a general staff to procure and present. It is probable that there would be in such case a number of alternative plans, each having advantages and disadvantages, and these should be worked out each by itself, with the reasons for and against it, and presented to the President or general for his determination. This the general staff should do. This cannot be done in an hour. It requires that the general staff shall have been at work for a long time collecting the information and arranging it and getting it in form to present. Then at home, where the preparation for the expedition is to be made, the order must be based upon a knowledge of the men and material available for its execution; how many men there are who can be devoted to that purpose, from what points they are to be drawn, what bodies of troops ought to be left or sent elsewhere, and what bodies may be included in the proposed expedition; whether there are enough ships to transport them; where they are to be obtained; whether they are properly fitted up; what more should be done to them; what are the available stocks of clothing, arms and ammunition, and engineers' material, and horses and wagons, and all the immediate supplies and munitions necessary for a large expedition; how are the things to be supplied which are not ready, but which are necessary, and how long a time will be required to supply them.

All this and much more necessary information it is the business of a general staff to supply. When that has been done the order is made with all available knowledge of all the circumstances upon which the movement depends for its success. It is then the business of the General Staff to see that every separate officer upon whose action the success of the movement depends understands his share in it and does not lag behind in the performance of that share; to see that troops and ships and animals and supplies of arms and ammunition and clothing and food, etc., from hundreds of sources come together at the right times and places. It is a laborious, complicated, and difficult work, which requires a considerable number of men whose special business it is and who are charged with no other duties.

It was the lack of such a body of men doing that kind of work which led to the confusion attending the Santiago expedition in the summer of 1898. The confusion at Tampa and elsewhere was the necessary result of having a large number of men, each of them doing his own special work the best he could, but without any adequate force of officers engaged in seeing that they pulled together according to plans made beforehand. Such a body of men doing general staff duty is just as necessary in time of peace as it is in time of war. It is not an executive body; it is not an administrative body; it acts only through the authority of others. It makes intelligent command possible by procuring and arranging information and working out plans in detail, and it makes intelligent and effective execution of commands possible by keeping all separate agents advised of the parts they are to play in the general scheme.

[From *Selected Addresses and Essays* by Viscount Haldane, John Murray, London, 1928]

LEADERS AND SPECIALISTS

By Richard B. Haldane

(1913)

The so-called heaven-born leader has a genius so strong that he will come to the front by sheer force of that genius almost wherever his lot be cast, for he is heaven-born in the sense that he is not like other men. But in these days of specialized function a nation requires many leaders of a type less rare—subordinates who obediently accept the higher command and carry it out, but who still are, relatively speaking, leaders. Such men cannot, for by far the greater part, be men of genius; and yet the part they play is necessary, and because it is necessary the State must provide for their production and their nurture. At this point the history of the modern State shows that the University plays an important part. . . .

When my relative and predecessor in the office of Lord Chancellor, John Scott, Lord Eldon, was asked what was the real way to ensure for young men success at the Bar, he replied: "I know no rule to give them but that they must make up their minds to live like a hermit and work like a horse." He had himself, in a notable fashion, put his precept into practice. But here again I must utter a word of warning about the precept of my distinguished relative. The rule of practice which I have quoted from him I believe to be indispensable, whatever career you choose. But in carrying it into effect you must guard against the temptation to become what is called too practical, that is to say, narrow and uninteresting. Youth, with its elasticity and boundless energy, is the time to lay the foundations of wide knowledge and catholic interests. The wider and more catholic these are the better, provided that they do not distract you from the necessary concentration on your special object.

They need not do so. Time is infinitely long for him who knows how to use it, and the mind is not like a cubic measure that can contain only a definite amount. Increase, therefore, wherever you can, without becoming amateurs in your own calling, the range of your interests.

Every man and woman is, after all, a citizen in a State. Therefore let us see to it that there is not lacking that interest in the larger life of the social whole which is the justification of a real title to have a voice and a vote. Literature, philosophy, religion, are all widening interests. So is science, so are music and the fine arts. Let every one concern himself with these or such of them as he thinks can really appeal to him. So only will his outlook be wide enough to enable him to fill his station and discharge his duties with distinction. He ought to be master of much knowledge besides that of his profession. He must try to think greatly and widely.

So only will he succeed if he is called to the higher vocations where leadership is essential. For there is a lower class, a middle class, and

an aristocracy of intelligence. The lower class may do some things better than the intellectual aristocrat. I have known Senior Wranglers who would have been below par as bank clerks. Again, there is a large class of skilled work, some of it requiring long training and even initiative, which is done better by competent permanent officials than by statesmen even of a high order. But when we come to the highest order of work it is different. There is a common cry that this, too, should be left to the expert. There is no more complete misinterpretation of a situation.

The mere expert, if he were charged with the devising and execution of high aims and policy, would be at sea among a multitude of apparently conflicting considerations. What is the relation of a particular plan to a great national policy and to far-reaching principles and ends? Questions like these must always be for the true leader and not for the specialist. But if the former is wise, as soon as he has made up his mind clearly as to what he wants, he will choose his expert and consult him at every turn, and entrust him freely with the execution of a policy for which he himself will remain responsible. Such a course requires capacity of a high kind, and the widest sort of knowledge. But without it success is impossible. No man can know or do everything himself, and the great man of affairs always knows how and what to delegate.

The procedure of such men in their work is instructive as to other and less responsible situations. They are never overwhelmed with that work, because their knowledge and their insight enables them to sift out what they themselves must do, and to entrust the rest freely to picked subordinates. For the spirit that is necessary to develop this gift in the higher callings in life, the wide outlook, the training in which can be commenced in the University better than anywhere else, is of vital importance. Whether a man is to be teacher, or doctor, or lawyer, or minister of religion, it is width of outlook that for most men in the end makes the difference. Of course for genius there is no rule, and great natural talent of the rarer order can also dispense with much. But I wish to say to you emphatically that it is just here and now, in your student years, that you make yourselves what you will be, and that you are, nearly all of you, most responsible for your failure or success in later life. It is not that I think a purely intellectual life something of which everything else must fall short; far from it. You have only to read the Gospels to find the conclusive demonstration that this is not so. But I do think that the atmosphere of intelligence is the atmosphere where the inner life, whatever it may be, most completely expands and culminates.

Bacon, in his essay on "Studies," uses some words which we do well to bear in mind if we would keep our sense of proportion: "Studies," he says, "serve for delight, for ornament, and for ability. Their chief use for delight is in privateness and retiring; for ornament is in discourse; and for ability is in the judgment and disposition of business. For expert men can execute, and perhaps judge of, particulars one by one. But the general counsels and the plots and marshalling of affairs come best from those that are *learned*. To spend too much time

in studies is sloth. To use them too much for ornament is affectation; to make judgment wholly by their rules is the humour of a scholar. They perfect nature and are perfected by experience." They perfect nature, for they provide an atmosphere in which natural gifts grow and expand. They are perfected by experience, because their gaps are filled up by what we can learn in practical life alone, and the life of theory and the life of practice by reacting on and penetrating each other, form a truly proportioned entirety.

The strength of men like Cromwell, like Napoleon, like Lincoln and like Bismarck, is their grasp of great principles and their resoluteness in carrying them into application. For even where great men have not been of the scholar class they have been under the domination of beliefs which rested on a foundation of principle and were inspired to the extent of becoming suffused by passion. And without passion nothing great is or ever has been accomplished. I do not mean by passion violent or obvious emotion. I mean the concentration which gives rise to singleness of purpose in forming and executing great plans, and is, in fact, a passion for excellence. And if this exists enough in you to bring you into leadership of any kind at the University it will probably again bring you into leadership later on in life, provided always that you select your line of action with prudence and hold to it undeviatingly. . . .

There was a time when men of business, accustomed to see closely to profit and loss, used to think that the work of a University was worth effort and expenditure only in so far as it produced aptitude for industrial and commercial production. Traces of this view are still apparent in the foundation deeds of some of the older University Colleges of our municipalities. But this idea is now discredited, and the part played by science and by general learning in the production alike of the captain of industry and of the extension of invention is far greater than was the case even a few years ago. Applied science is in its best form only possible on a wide foundation of general science. And the fruitful scientific spirit is developed to-day on a basis of high intellectual training, the training which only the atmosphere of the fully developed University can completely provide. What is true of science in the narrower sense is also true of learning generally. It is only by the possession of a trained and developed mind that the fullest capacity can, as a general rule, be obtained. There are, of course, exceptional individuals with rare natural gifts which make up for deficiencies. But such gifts are indeed rare. We are coming more and more to recognize that the best specialist can be produced only after a long training in general learning. The grasp of principle which makes detail easy can only come when innate capacity has been evoked and moulded by high training. Our engineers, our lawyers, our doctors, our administrators, our inventors, cannot keep in front in the race, or hold their own amid the rivalry of talent, unless their minds have been so widely trained that the new problems with which the ever-increasing complications and specializations of modern conditions confront them, present nothing more formidable than new applications of first principles which have been thoroughly assimilated.

[From *Wirtschaft und Gesellschaft* (1922) translated in *Essays in Sociology*, Edited by H. H. Gerth and C. Wright Mills, Oxford University Press, 1946]

THE RULER VS. THE EXPERT

By Max Weber

THE POWER POSITION OF BUREAUCRACY

Everywhere the modern state is undergoing bureaucratization. But whether the *power* of bureaucracy within the polity is universally increasing must here remain an open question.

The fact that bureaucratic organization is technically the most highly developed means of power in the hands of the man who controls it does not determine the weight that bureaucracy as such is capable of having in a particular social structure. The ever-increasing 'indispensability' of the officialdom, swollen to millions, is no more decisive for this question than is the view of some representatives of the proletarian movement that the economic indispensability of the proletarians is decisive for the measure of their social and political power position. If 'indispensability' were decisive, then where slave labor prevailed and where freemen usually abhor work as a dishonor, the 'indispensable' slaves ought to have held the positions of power, for they were at least as indispensable as officials and proletarians are today. Whether the power of bureaucracy as such increases cannot be decided *a priori* from such reasons. The drawing in of economic interest groups or other non-official experts, or the drawing in of non-expert lay representatives, the establishment of local, inter-local, or central parliamentary or other representative bodies, or of occupational associations—these *seem* to run directly against the bureaucratic tendency. How far this appearance is the truth must be discussed in another chapter rather than in this purely formal and typological discussion. In general, only the following can be said here:

Under normal conditions, the power position of a fully developed bureaucracy is always overtowering. The 'political master' finds himself in the position of the 'dilettante' who stands opposite the 'expert,' facing the trained official who stands within the management of administration. This holds whether the 'master' whom the bureaucracy serves is a 'people,' equipped with the weapons of 'legislative initiative,' the 'referendum,' and the right to remove officials, or a parliament, elected on a more aristocratic or more 'democratic' basis and equipped with the right to vote a lack of confidence, or with the actual authority to vote it. It holds whether the master is an aristocratic, collegiate body, legally or actually based on self-recruitment, or whether he is a popularly elected president, a hereditary and 'absolute' or a 'constitutional' monarch. . . .

The absolute monarch is powerless opposite the superior knowledge of the bureaucratic expert—in a certain sense more powerless than any other political head. All the scornful decrees of Frederick the Great concerning the 'abolition of serfdom' were derailed, as it were, in the course of their realization because the official mechanism simply

ignored them as the occasional ideas of a dilettante. When a constitutional king agrees with a socially important part of the governed, he very frequently exerts a greater influence upon the course of administration than does the absolute monarch. The constitutional king can control these experts better because of what is, at least relatively, the public character of criticism, whereas the absolute monarch is dependent for information solely upon the bureaucracy. The Russian czar of the old regime was seldom able to accomplish permanently anything that displeased his bureaucracy and hurt the power interests of the bureaucrats. His ministerial departments, placed directly under him as the autocrat, represented a conglomerate of satrapies, as was correctly noted by Leroy-Beaulieu. These satrapies constantly fought against one another by all the means of personal intrigue, and, especially, they bombarded one another with voluminous 'memorials,' in the face of which, the monarch, as a dilettante, was helpless.

With the transition to constitutional government, the concentration of the power of the central bureaucracy in one head became unavoidable. Officialdom was placed under a monocratic head, the prime minister, through whose hands everything had to go before it got to the monarch. This put the latter, to a large extent, under the tutelage of the chief of the bureaucracy. Wilhelm II, in his well-known conflict with Bismarck, fought against this principle, but he had to withdraw his attack very soon. Under the rule of expert knowledge, the actual influence of the monarch can attain steadiness only by a continuous communication with the bureaucratic chiefs; this intercourse must be methodically planned and directed by the head of the bureaucracy.

At the same time, constitutionalism binds the bureaucracy and the ruler into a community of interests against the desires of party chiefs for power in the parliamentary bodies. And if he cannot find support in parliament the constitutional monarch is powerless against the bureaucracy. The desertion of the 'Great of the Reich,' the Prussian ministers and top officials of the Reich in November 1918, brought a monarch into approximately the same situation as existed in the feudal state in 1056. However, this is an exception, for, on the whole, the power position of a monarch opposite bureaucratic officials is far stronger than it was in any feudal state or in the 'stereotyped' patrimonial state. This is because of the constant presence of aspirants for promotion, with whom the monarch can easily replace inconvenient and independent officials. Other circumstances being equal, only economically independent officials, that is, officials who belong to the propertied strata, can permit themselves to risk the loss of their offices. Today as always, the recruitment of officials from among propertyless strata increases the power of the rulers. Only officials who belong to a socially influential stratum, whom the monarch believes he must take into account as personal supporters, like the so-called *Kanalrebellien* in Prussia, can permanently and completely paralyse the substance of his will. . . .

THE DEVELOPMENT OF BUREAUCRACY

More and more the specialized knowledge of the expert became the foundation for the power position of the officeholder. Hence an early concern of the ruler was how to exploit the special knowledge of experts without having to abdicate in their favor but preserve his dominant

position. With the qualitative extension of administrative tasks and therewith the indispensability of expert knowledge, it typically happens that the lord no longer is satisfied by occasional consultation with individual and proved confidants or even with an assembly of such men called together intermittently and in difficult situations. The lord begins to surround himself with *collegiate* bodies who deliberate and resolve in continuous session.* The *Räte von Haus aus* is a characteristic transitional phenomenon in this development.

The position of such collegiate bodies naturally varies according to whether they become the highest administrative authority, or whether a central and monocratic authority, or several such authorities stand at their side. In addition, a great deal depends upon their procedure. When the collegiate type is fully developed, such bodies, in principle or in fiction, meet with the lord in the chair and all important matters are elucidated from all points of view in the papers of the respective experts and their assistants and by the reasoned votes of the other members. The matter is then settled by a resolution, which the lord will sanction or reject by an edict. This kind of collegiate body is the typical form in which the ruler, who increasingly turns into a 'dilettante,' at the same time exploits expert knowledge and—what frequently remains unnoticed—seeks to fend off the overpowering weight of expert knowledge and to maintain his dominant position in the face of experts. He keeps one expert in check by others and by such cumbersome procedures he seeks personally to gain a comprehensive picture as well as the certainty that nobody prompts him to arbitrary decisions. Often the prince expects to assure himself a maximum of personal influence less from personally presiding over the collegiate bodies than from having written memoranda submitted to him. Frederick William I of Prussia actually exerted a very considerable influence on the administration, but he almost never attended the collegiately organized sessions of the cabinet ministers! He rendered his decisions on written presentations by means of marginal comments or edicts. These decisions were delivered to the ministers by the *Feldjaeger* of the *Cabinet*, after consultation with those servants who belonged to the cabinet and were personally attached to the king.

The hatred of the bureaucratic departments turns against the cabinet just as the distrust of the subjects turns against the bureaucrats in case of failure. The cabinet in Russia, as well as in Prussia and in other states, thus developed into a personal fortress in which the ruler, so to speak, sought refuge in the face of expert knowledge and the impersonal and functional routinization of administration.

By the collegiate principle the ruler furthermore tries to fashion a sort of synthesis of *specialized experts* into a collective unit. His success in doing this cannot be ascertained in general. The phenomenon itself, however, is common to very different forms of state, from the patrimonial and feudal to the early bureaucratic, and it is especially typical for early princely absolutism. The collegiate principle has proved itself to be one of the strongest educative means for 'matter-of-factness' in administration. It has also made possible the drawing in of socially influential private persons and thus to combine in some measure the

**Conseil d'Etat*, Privy Council, *Generaldirektorium*, *Cabinet*, *Divan*, *Tsung-li Yamen*, *Wai-wu pu*, etc.

authority of notables and the practical knowledge of private enterprisers with the specialized expertness of professional bureaucrats. The collegiate bodies were one of the first institutions to allow the development of the modern concept of 'public authorities,' in the sense of enduring structures independent of the person.

As long as an expert knowledge of administrative affairs was the exclusive product of a long empirical practice, and administrative norms were not regulations but elements of tradition, the council of *elders*—in a manner typical often with priests, 'elder statesmen,' and notables participating—was the adequate form for collegiate authorities, which in the beginning merely gave advice to the ruler. But as such bodies continued to exist in the face of changing rulers, they often usurped actual power. The Roman Senate and the Venetian Council, as well as the Athenian *Areopag* until its downfall and replacement by the rule of the *demagogos* acted in this manner. We must of course sharply distinguish such authorities from the corporate bodies under discussion here.

In spite of manifold transitions, collegiate bodies, as a type, emerge on the basis of the rational specialization of functions and the rule of expert knowledge. . . .

THE RATIONALIZATION OF EDUCATION

Expressed in slogan-like fashion, the 'cultivated man,' rather than the 'specialist,' has been the end sought by education and has formed the basis of social esteem in such various systems as the feudal, theocratic, and patrimonial structures of dominion: in the English notable administration, in the old Chinese patrimonial bureaucracy, as well as under the rule of demagogues in the so-called Hellenic democracy.

The term 'cultivated man' is used here in a completely value-neutral sense; it is understood to mean solely that the goal of education consists in the quality of a man's bearing in life which was *considered* 'cultivated' rather than in a specialized training for expertness. The 'cultivated' personality formed the educational ideal, which was stamped by the structure of domination and by the social condition for membership in the ruling stratum. Such education aimed at a chivalrous or an ascetic type; or, at a literary type, as in China; a gymnastic-humanist type, as in Hellas; or it aimed at a conventional type, as in the case of the Anglo-Saxon gentleman. The qualification of the ruling stratum as such rested upon the possession of 'more' cultural quality (in the absolutely changeable, value-neutral sense in which we use the term here), rather than upon 'more' expert knowledge. Special military, theological, and juridical ability was of course intensely practiced; but the point of gravity in Hellenic, in mediæval, as well as in Chinese education, has rested upon educational elements that were entirely different from what was 'useful' in one's speciality.

Behind all the present discussions of the foundations of the educational system, the struggle of the 'specialist type of man' against the older type of 'cultivated man' is hidden at some decisive point. This fight is determined by the irresistibly expanding bureaucratization of all public and private relations of authority and by the ever-increasing importance of expert and specialized knowledge. This fight intrudes into all intimate cultural questions.

[From *Science and the Modern World* (Lowell Lectures, 1925), The Free Press, New York]

DANGERS OF SPECIALIZATION

By Alfred North Whitehead

Another great fact confronting the modern world is the discovery of the method of training professionals, who specialise in particular regions of thought and thereby progressively add to the sum of knowledge within their respective limitations of subject. In consequence of the success of this professionalising of knowledge, there are two points to be kept in mind, which differentiate our present age from the past. In the first place, the rate of progress is such that an individual human being, of ordinary length of life, will be called upon to face novel situations which find no parallel in his past. The fixed person for the fixed duties, who in older societies was such a godsend, in the future will be a public danger. In the second place, the modern professionalism in knowledge works in the opposite direction so far as the intellectual sphere is concerned. The modern chemist is likely to be weak in zoology, weaker still in his general knowledge of the Elizabethan drama, and completely ignorant of the principles of rhythm in English versification. It is probably safe to ignore his knowledge of ancient history. Of course I am speaking of general tendencies; for chemists are no worse than engineers, or mathematicians, or classical scholars. Effective knowledge is professionalised knowledge, supported by a restricted acquaintance with useful subjects subservient to it.

This situation has its dangers. It produces minds in a groove. Each profession makes progress, but it is progress in its own groove. Now to be mentally in a groove is to live in contemplating a given set of abstractions. The groove prevents straying across country, and the abstraction abstracts from something to which no further attention is paid. But there is no groove of abstractions which is adequate for the comprehension of human life. Thus in the modern world, the celibacy of the medieval learned class has been replaced by a celibacy of the intellect which is divorced from the concrete contemplation of the complete facts. Of course, no one is merely a mathematician, or merely a lawyer. People have lives outside their professions or their businesses. But the point is the restraint of serious thought within a groove. The remainder of life is treated superficially, with the imperfect categories of thought derived from one profession.

The dangers arising from this aspect of professionalism are great, particularly in our democratic societies. The directive force of reason is weakened. The leading intellects lack balance. They see this set of circumstances, or that set; but not both sets together. The task of coördination is left to those who lack either the force or the character to succeed in some definite career. In short, the specialised functions of the community are performed better and more progressively, but the generalised direction lacks vision. The progressiveness in detail only adds to the danger produced by the feebleness of coördination.

This criticism of modern life applies throughout, in whatever sense you construe the meaning of a community. It holds if you apply it to

a nation, a city, a district, an institution, a family, or even to an individual. There is a development of particular abstractions, and a contraction of concrete appreciation. The whole is lost in one of its aspects. It is not necessary for my point that I should maintain that our directive wisdom, either as individuals or as communities, is less now than in the past. Perhaps it has slightly improved. But the novel pace of progress requires a greater force of direction if disasters are to be avoided. The point is that the discoveries of the nineteenth century were in the direction of professionalism, so that we are left with no expansion of wisdom and with greater need of it.

Wisdom is the fruit of a balanced development. It is this balanced growth of individuality which it should be the aim of education to secure. The most useful discoveries for the immediate future would concern the furtherance of this aim without detriment to the necessary intellectual professionalism.

My own criticism of our traditional educational methods is that they are far too much occupied with intellectual analysis, and with the acquirement of formalised information. What I mean is, that we neglect to strengthen habits of concrete appreciation of the individual facts in their full interplay of emergent values, and that we merely emphasize abstract formulations which ignore this aspect of the interplay of diverse values.

In every country the problem of the balance of the general and specialist education is under consideration. I cannot speak with first-hand knowledge of any country but my own. I know that there, among practical educationalists, there is considerable dissatisfaction with the existing practice. Also, the adaptation of the whole system to the needs of a democratic community is very far from being solved. I do not think that the secret of the solution lies in terms of the antithesis between thoroughness in special knowledge and general knowledge of a slighter character. The make-weight which balances the thoroughness of the specialist intellectual training should be of a radically different kind from purely intellectual analytical knowledge. At present our education combines a thorough study of a few abstractions, with a slighter study of a larger number of abstractions. We are too exclusively bookish in our scholastic routine. The general training should aim at eliciting our concrete apprehensions, and should satisfy the itch of youth to be doing something. There should be some analysis even here, but only just enough to illustrate the ways of thinking in diverse spheres. In the Garden of Eden Adam saw the animals before he named them: in the traditional system, children named the animals before they saw them.

There is no easy single solution of the practical difficulties of education. We can, however, guide ourselves by a certain simplicity in its general theory. The student should concentrate within a limited field. Such concentration should include all practical and intellectual acquirements requisite for that concentration. This is the ordinary procedure; and, in respect to it, I should be inclined even to increase the facilities for concentration rather than to diminish them. With the concentration there are associated certain subsidiary studies, such as languages for science. Such a scheme of professional training should be directed to a clear end congenial to the student. It is not necessary to elaborate the qualifications of these statements. Such a training

must, of course, have the width requisite for its end. But its design should not be complicated by the consideration of other ends. This professional training can only touch one side of education. Its centre of gravity lies in the intellect, and its chief tool is the printed book. The centre of gravity of the other side of training should lie in intuition without an analytical divorce from the total environment. Its object is immediate apprehension with the minimum of eviscerating analysis. The type of generality, which above all is wanted, is the appreciation of variety of value. I mean an aesthetic growth. There is something between the gross specialised values of the mere practical man, and the thin specialised values of the mere scholar. Both types have missed something; and if you add together the two sets of values, you do not obtain the missing elements. What is wanted is an appreciation of the infinite variety of vivid values achieved by an organism in its proper environment. When you understand all about the sun and all about the atmosphere and all about the rotation of the earth, you may still miss the radiance of the sunset. There is no substitute for the direct perception of the concrete achievement of a thing in its actuality. We want concrete fact with a high light thrown on what is relevant to its preciousness.

[From *The Nature of the Physical World*, The Gifford Lectures, 1927, University Press, Cambridge, 1928]

THE SECLUDED BURSAR

By A. S. Eddington

An aged college Bursar once dwelt secluded in his rooms devoting himself entirely to accounts. He realised the intellectual and other activities of the college only as they presented themselves in the bills. He vaguely conjectured an objective reality at the back of it all—some sort of parallel to the real college—though he could only picture it in terms of the pounds, shillings and pence which made up what he would call “the commonsense college of everyday experience”. The method of account-keeping had become inveterate habit handed down from generations of hermit-like bursars; he accepted the form of accounts as being part of the nature of things. But he was of a scientific turn and he wanted to learn more about the college. One day in looking over his books he discovered a remarkable law. For every item on the credit side an equal item appeared somewhere else on the debit side. “Ha!” said the Bursar, “I have discovered one of the great laws controlling the college. It is a perfect and exact law of the real world. Credit must be called plus and debit minus; and so we have the law of conservation of £ s. d. This is the true way to find out things, and there is no limit to what may ultimately be discovered by this scientific method. I will pay no more heed to the superstitions held by some of the Fellows as to a beneficent spirit called the King or evil spirits called the University Commissioners. I have only to go on in this way and I shall succeed in understanding why prices are always going up.”

I have no quarrel with the Bursar for believing that scientific investigation of the accounts is a road to exact (though necessarily partial)

knowledge of the reality behind them. Things may be discovered by this method which go deeper than the mere truism revealed by his first effort. In any case his life is especially concerned with accounts and it is proper that he should discover the laws of accounts whatever their nature. But I would point out to him that a discovery of the overlapping of the different aspects in which the realities of the college present themselves in the world of accounts, is not a discovery of the laws controlling the college; that he has not even begun to find the controlling laws. The college may totter but the Bursar's accounts still balance.

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THE LIMITATIONS OF THE EXPERT

By Harold J. Laski

The day of the plain man has passed. No criticism of democracy is more fashionable in our time than that which lays emphasis upon his incompetence. This is, we are told, a big and complex world, about which we have to find our way at our peril. The plain man is too ignorant and too uninterested to be able to judge the adequacy of the answers suggested to our problems. As in medicine we go to a doctor, or in bridge-building to an engineer, so in matters of social policy we should go to an expert in social questions. He alone, we are told with increasing emphasis, can find his way about the labyrinthine intricacies of modern life. He alone knows how to find the facts, and determine what they mean. The plain man is simply obsolete in a world he has never been trained to understand. Either we must trust the making of fundamental decisions to experts, or there will be a breakdown in the machinery of government.

Now much of this skepticism is a natural and justifiable reaction from the facile and romantic optimism of the nineteenth century. Jefferson in America, Bentham in England did too easily assume not only an inherent rightness in the opinions of the multitude but also an instinctive wisdom in its choices. They did tend to think that social problems could be easily understood, and that public interest in their solution would be widespread and passionate. From their philosophy was born the dangerous inference that any man, without training in affairs, could hope usefully to control their operation.

They did not see that merely to formulate rightly the nature of a social problem is far more difficult than to formulate rightly a problem in physics or chemistry. No one assumes that the plain man is entitled to an opinion about the ether or vitamins or the historicity of the Donation of Constantine. Why should it be assumed that he has competence about the rates of taxation, or the validity of tariff-schedules, or the principles of a penal code? Here, as in the fields of pure and applied science, his well-being, it is argued, depends essentially upon accepting the advice of the disinterested expert. The more elbowroom the latter possesses, the more likely we are to arrive at adequate decisions.

No one, I think, could seriously deny to-day that in fact none of our social problems is capable of wise resolution without formulation of its

content by an expert mind. A Congressman at Washington, a member of Parliament at Westminster cannot hope to understand the policy necessary to a proper understanding of Soviet Russia merely by the light of nature. The facts must be gathered by men who have been trained to a special knowledge of the new Russia, and the possible inferences from those facts must be set out by them. The plain man cannot plan a town, or devise a drainage system, or decide upon the wisdom of compulsory vaccination without aid and knowledge at every turn from men who have specialized in those themes. He will make grave mistakes about them, possibly even fatal mistakes. He will not know what to look for; he may easily miss the significance of what he is told. That the contours of any subject must be defined by the expert before the plain man can see its full significance will, I believe, be obvious to anyone who has reflected upon the social process in the modern world.

II

But it is one thing to urge the need for expert consultation at every stage in making policy; it is another thing, and a very different thing, to insist that the expert's judgment must be final. For special knowledge and the highly trained mind produce their own limitations which, in the realm of statesmanship, are of decisive importance. *Expertise*, it may be argued, sacrifices the insight of common sense to intensity of experience. It breeds an inability to accept new views from the very depth of its preoccupation with its own conclusions. It too often fails to see round its subject. It sees its results out of perspective by making them the center of relevance to which all other results must be related. Too often, also, it lacks humility; and this breeds in its possessors a failure in proportion which makes them fail to see the obvious which is before their very noses. It has, also, a certain caste-spirit about it, so that experts tend to neglect all evidence which does not come from those who belong to their own ranks. Above all, perhaps, and this most urgently where human problems are concerned, the expert fails to see that every judgment he makes not purely factual in nature brings with it a scheme of values which has no special validity about it. He tends to confuse the importance of his facts with the importance of what he proposes to do about them.

Each one of these views needs illustration, if we are to see the relation of *expertise* to statesmanship in proper perspective. The expert, I suggest, sacrifices the insight of common sense to the intensity of his experience. No one can read the writings of Mr. F. W. Taylor, the efficiency-engineer, without seeing that his concentration upon the problem of reaching the maximum output of pig-iron per man per day made him come to see the laborer simply as a machine for the production of pig-iron.

He forgot the complexities of human nature, the fact that the subject of his experiments had a will of his own whose consent was essential to effective success. Business men prophesied the rapid breakdown of the Russian experiment because it had eliminated that profit-making motive which experience had taught them was at the root of Western civilization. But they failed to see that Russia might call into play new motives and new emotions not less powerful, even if different in

their operation, from the old. The economic experts of the early nineteenth century were fairly unanimous in insisting that the limitation of the hours of labor must necessarily result in a decrease of prosperity. They lacked the common sense to see that a prohibition upon one avenue of profit would necessarily lead to so intense an exploration of others as to provide a more than adequate compensation for the effort they deplored.

The expert, again, dislikes the appearance of novel views. Here, perhaps, the experience of science is most suggestive since the possibility of proof in this realm avoids the chief difficulties of human material. Everyone knows of the difficulties encountered by Jenner in his effort to convince his medical contemporaries of the importance of vaccination. The Royal Society refused to print one of Joule's most seminal papers. The opposition of men like Sir Richard Owen and Adam Sedgwick to Darwin resembled nothing so much as that of Rome to Galileo. Not even so great a surgeon as Simpson could see merit in Lister's discovery of antiseptic treatment. The opposition to Pasteur among medical men was so vehement that he declared regretfully that he did not know he had so many enemies. Lacroix and Poisson reported to the French Academy of Sciences that Galois' work on the theory of groups, which Cayley later put among the great mathematical achievements of the nineteenth century, was quite unintelligible. Everyone knows how biologists and physicists failed to perceive for long years the significance of Gregor Mendel and Willard Gibbs.

These are instances from realms where, in almost every case, measurable proof of truth was immediately obtainable; and, in each case, novelty of outlook was fatal to a perception of its importance. In social matters, where the problem of measurement is infinitely more difficult, the expert is entitled to far less assurance. He can hardly claim that any of his fundamental questions have been so formulated that he can be sure that the answer is capable of a certainly right interpretation. The student of race, for instance, is wise only if he admits that his knowledge of his subject is mainly a measure of his ignorance of its boundaries. The student of eugenics can do little more than insist that certain hereditary traits, deaf-mutism, for example, or haemophilia, make breeding from the stocks tainted by them undesirable; he cannot tell us what fitness means nor show us how to breed the qualities upon which racial adequacy depends. It would be folly to say that we are destined never to know the laws which govern life; but, equally certainly, it would be folly to argue that our knowledge is sufficient to justify any expert, in any realm of social importance, claiming finality for his outlook.

He too often, also, fails to see his results in their proper perspective. Anyone who examines the conclusions built, for example, upon the use of intelligence tests will see that this is the case. For until we know exactly how much of the ability to answer the questions used as their foundation is related to differentiated home environments, how effectively, that is, the experiment is really pure, they cannot tell us anything. Yet the psychologists who accept their results have built upon them vast and glittering generalizations as, for instance, about the inferior mental quality of the Italian immigrant in America; as though a little common sense would not make us suspect conclusions

indicating mental inferiority in the people which produced Dante and Petrarch, Vico and Machiavelli. Generalizations of this kind are merely arrogant; and their failure to see, as experts, the *a priori* dubiety of their results, obviously raises grave issues about their competence to pronounce upon policy.

Vital, too, and dangerous, is the expert's caste-spirit. The inability of doctors to see light from without is notorious; and a reforming lawyer is at least as strange a spectacle as one prepared to welcome criticism of his profession from men who do not practice it. There is, in fact, no expert group which does not tend to deny that truth may possibly be found outside the boundary of its private Pyrenees. Yet, clearly enough, to accept its dicta as final, without examination of their implications, would be to accept grave error as truth in almost every department of social effort. Every expert's conclusion is a philosophy of the second best until it has been examined in terms of a scheme of values not special to the subject matter of which he is an exponent.

Everyone knows, for example, that admirals invariably fail to judge naval policy in adequate terms; and in Great Britain, at any rate, the great military organizers, men like Cardwell and Haldane, have had to pursue their task in face of organized opposition from the professional soldier. The Duke of Wellington was never brought to see the advantage of the breech-loading rifle; and the history of the tank in the last war is largely a history of civilian enterprise the value of which the professional soldier was brought to see only with difficulty.

The expert, in fact, simply by reason of his immersion in a routine, tends to lack flexibility of mind once he approaches the margins of his special theme. He is incapable of rapid adaptation to novel situations. He unduly discounts experience which does not tally with his own. He is hostile to views which are not set out in terms he has been accustomed to handle. No man is so adept at realizing difficulties within the field that he knows; but, also, few are so incapable of meeting situations outside that field. Specialism seems to breed a horror of unwonted experiment, a weakness in achieving adaptability, both of which make the expert of dubious value when he is in supreme command of a situation.

This is, perhaps, above all because the expert rarely understands the plain man. What he knows, he knows so thoroughly that he is impatient with men to whom it has to be explained. Because he practices a mystery, he tends to assume that, within his allotted field, men must accept without question the conclusions at which he has arrived. He too often lacks that emollient quality which makes him see that conclusions to which men assent are far better than conclusions which they are bidden, without persuasion, to decline at their peril. Everyone knows how easily human personality becomes a unit in a statistical table for the bureaucrat; and there must be few who have not sometimes sympathized with the poor man's indignation at the social worker. People like Jane Addams, who can retain, amid their labors, a sense of the permanent humanity of the poor are rare enough to become notable figures in contemporary life.

The expert, in fact, tends to develop a certain condescension towards the plain man which goes far towards the invalidation of his *expertise*.

Men in India who have become accustomed to the exercise of power, cannot believe, without an imaginative effort of which few of them are capable, that the Indian is entitled to his own ideas of how he should be governed. Civil servants tend easily to think that members of Parliament or Congress are an ignorant impediment to their labors. Professional historians, who cultivate some minute fragment of an epoch's history, cannot appreciate the superb incursions of a brilliant amateur like Mr. H. G. Wells. It has taken professional economists more than a generation to realize that the trade unions have a contribution to make to the understanding of industrial phenomena without which their own interpretation is painfully incomplete.

There is, in fact, not less in the expert's mind than in that of the plain man what Mr. Justice Holmes has termed an "inarticulate major premise" quite fundamental to his work. I have known an expert in the British Foreign Office whose advice upon China was built upon the assumption that the Chinese have a different human nature from that of Englishmen; and what was, in fact, an obvious private prejudice was, for him, the equally obvious outcome of a special experience which could not brook contradiction. Judges of the Supreme Court have had no difficulty in making the Fourteenth Amendment the embodiment of the *laissez-faire* philosophy of the nineteenth century; and few of them have realized that they were simply making the law express their unconscious dislike of governmental experiment. The history of trade-union law in England is largely an attempt, of course mainly unconscious, by judicial experts to disguise their dislike of working-men's organization in terms of a mythology to which the convenient name of "public policy" could be attached. The attitude of the British High Command to the death-penalty, of lawyers like Lord Eldon to the relaxation of penal severity, of business men to secrecy in finance, of statesmen to proposals for institutional reconstruction are all revelations of the expert's dislike of abandoning premises which, because he has grown accustomed to them, he tends to equate with the inevitable foundations of truth.

The expert tends, that is to say, to make his subject the measure of life, instead of making life the measure of his subject. The result, only too often, is an inability to discriminate, a confusion of learning with wisdom. "The fixed person for the fixed duties," Professor Whitehead has written, "who in older societies was such a godsend, in the future will be a public danger." In a sense, indeed, the more expert such fixed persons are, the more dangerous they are likely to be. For your great chemist, or doctor, or engineer, or mathematician is not an expert about life; he is precisely an expert in chemistry or medicine, engineering or mathematics. And the more highly expert he is, the more profoundly he is immersed in his routine, the less he is likely to know of the life about him. He cannot afford the time or the energy to give to life what his subject demands from him. He restrains his best intellectual effort within the routine about which he is a specialist. He does not co-ordinate his knowledge of a part with an attempt at wisdom about the whole.

This can be seen from many angles. Lord Kelvin was a great physicist, and his discoveries in cable-laying were of supreme importance to its development; but when he sought to act as a director of a cable-

laying company, his complete inability to judge men resulted in serious financial loss. Faraday was obviously one of the half-dozen outstanding physicists of modern times; but in the field of theological belief, he retained convictions which no man of common sense could accept. Mr. Henry Ford is obviously a business man of genius; but, equally obviously, his table talk upon themes outside his special sphere reveals a mentality which is mediocre in the extreme. Charles Babbage rendered immense service to the development of statistical science; but when he came to judge one of Tennyson's most famous poems he missed its beauty through an overvivid sense of its failure to conform to the revelations of the census returns.

The expert, in short, remains expert upon the condition that he does not seek to co-ordinate his specialism with the total sum of human knowledge. The moment that he seeks that co-ordination he ceases to be an expert. A doctor, a lawyer, an engineer who sought to act in terms of his specialism as President or Prime Minister would inevitably fail; to succeed, he must cease to be an expert. The wisdom that is needed for the direction of affairs is not an expert technic but a balanced equilibrium. It is a knowledge of how to use men, a faculty of judgment about the practicability of principles. It consists not in the possession of specialized knowledge, but in a power to utilize its results at the right moment, and in the right direction.

III

My point may perhaps be made by saying that *expertise* consists in such an analytic comprehension of a special realm of facts that the power to see that realm in the perspective of totality is lost. Such analytic comprehension is purchased at the cost of the kind of wisdom essential to the conduct of affairs. The doctor tends to think of men as patients; the teacher sees them as pupils; the statistician as units in a table. Bankers too often fail to realize that there is humanity even in men who have no check-books; Marxian socialists see sinister economic motive in the simplest expressions of the universal appetite for power. To live differently is to think differently; and to live as an expert in a small division of human knowledge is to make its principles commensurate with the ultimate deposit of historic experience. Not in that way does wisdom come.

Because a man is an expert on medieval French history, that does not make him the best judge of the disposition of the Saar Valley in 1919. Because a man is a brilliant prison doctor, that does not make him the person who ought to determine the principles of a penal code. The skill of the great soldier does not entitle him to decide upon the scale of military armament; just as no anthropologist, simply as an anthropologist, would be a fitting governor for a colonial territory peopled by native races. To decide wisely, problems must be looked at from an eminence. Intensity of vision destroys the sense of proportion. There is no illusion quite so fatal to good government as that of the man who makes his expert insight the measure of social need. We do not get progress in naval disarmament when admirals confer. We do not get legal progress from meetings of Bar associations. Congresses of teachers seem rarely to provide the means of educational

advance. The knowledge of what can be done with the results obtained in special disciplines seems to require a type of co-ordinating mind to which the expert, as such, is simply irrelevant.

This may be looked at from two points of view. "Political heads of departments are necessary," said Sir William Harcourt, "to tell the civil service what the public will not stand." That is, indeed, an essential picture of the place of the expert in public affairs. He is an invaluable servant and an impossible master. He can explain the consequences of a proposed policy, indicate its wisdom, measure its danger. He can point out possibilities in a proposed line of action. But it is of the essence of public wisdom to take the final initiative out of his hands.

For any political system in which a wide initiative belongs to the expert is bound to develop the vices of bureaucracy. It will lack insight into the movement and temper of the public mind. It will push its private nostrums in disregard of public wants. It will become self-satisfied and self-complacent. It will mistake its technical results for social wisdom, and it will fail to see the limits within which its measures are capable of effective application. For the expert, by definition, lacks contact with the plain man. He not only does not know what the plain man is thinking; he rarely knows how to discover his thoughts. He has dwelt so austere in his laboratory or his study that the content of the average mind is a closed book to him. He is at a loss how to manipulate the opinions and prejudices which he encounters. He has never learned the art of persuading men into acceptance of a thing they only half understand. He is remote from the substance of their lives. Their interests and hopes and fears have never been the counters with which he has played. He does not realize that, for them, his technical formulæ do not carry conviction because they are, as formulæ, incapable of translation into terms of popular speech. For the plain man, he is remote, abstract, alien. It is only the juxtaposition of the statesman between the expert and the public which makes specialist conclusions capable of application.

That, indeed, is the statesman's basic task. He represents, at his best, supreme common sense in relation to *expertise*. He indicates the limits of the possible. He measures what can be done in terms of the material at his disposal. A man who has been for long years in public affairs learns the art of handling men so as to utilize their talents without participating in their experience. He discovers how to persuade antagonistic views. He finds how to make decisions without giving reasons for them. He can judge almost by intuition the probable results of giving legislative effect to a principle. He comes to office able to co-ordinate varied aspects of *expertise* into something which looks like a coherent program. He learns to take risks, to trust to sub-conscious insight instead of remaining dependent upon reasoned analysis.

The expert's training is, as a rule, fatal to these habits which are essential to the leadership of a multitude. That is why, for example, the teacher and the scholar are rarely a success in politics. For they have little experience of the need for rapid decision; and their type of mental discipline leads them to consider truth in general rather than the truth of popular discussion. They have not been trained to the

business of convincing the plain man; and modern government is impossible to those who do not possess this art.

Nothing, indeed, is more remarkable in a great public department than to watch a really first-rate public man drive his team of expert officials. He knows far less than they do of the affairs of the Department. He has to guess at every stage the validity of their conclusions. On occasion, he must either choose between alternatives which seem equally balanced or decide upon a policy of which his officials disapprove. Not seldom, he must quicken their doubts into certainties; not seldom, also, he must persuade them into paths they have thus far refused to tread. The whole difference between a great Minister and a poor one lies in his ability to utilize his officials as instruments. His success depends upon weaving a policy from the discrete threads of their *expertise*. He must discover certain large principles of policy and employ them in finding the conditions of its successful operation. He must have the power to see things in a big way, to simplify, to co-ordinate, to generalize. Anyone who knows the work of Lord Haldane at the British War Office from 1906 to 1911, or of Mr. Arthur Henderson as Foreign Secretary in the last eighteen months, can understand the relation between the statesman and his expert which makes, and which alone can make, for successful administration.

Its essence, as a relation, is that the ultimate decisions are made by the amateur and not by the specialist. It is that fact which gives them coherence and proportion. A cabinet of experts would never devise a great policy. Either their competing specialisms would clash, if their *expertise* was various in kind, or its perspective would be futile because it was similar. The amateur brings to them the relevance of the outer world and the knowledge of men. He disposes of private idiosyncrasy and technical prejudice. In convincing the non-specialist Minister that a policy propounded is either right or wrong, the expert is already halfway to convincing the public of his plans; and if he fails in that effort to convince, the chances are that his plans are, for the environment he seeks to control, inadequate or mistaken. For politics by its nature is not a philosophy of technical ideals, but an art of the immediately practical. And the statesman is pivotal to its organization because he acts as the broker of ideas without whom no bridges can be built between the expert and the multitude. It is no accident, but an inherent quality of his character, that the expert distrusts his fellow-specialist when the latter can reach that multitude. For him the gift of popular explanation is a proof of failure in the grasp of the discipline. His intensity of gaze makes him suspect the man who can state the elements of his mystery in general terms. He knows too much of minutiae to be comfortable upon the heights of generalization.

Nor must we neglect the other aspect of the matter. "The guest," said Aristotle with his homely wisdom, "will judge better of a feast than the cook." However much we may rely upon the expert in formulating the materials for decision, what ultimately matters is the judgment passed upon the results of policy by those who are to live by them. Things done by government must not only appear right to the expert; their consequences must seem right to the plain and average man.

And there is no way known of discovering his judgment save by deliberately seeking it. This, after all, is the really final test of government; for, at least over any considerable period, we cannot maintain a social policy which runs counter to the wishes of the multitude.

It is not the least of our dangers that we tend, from our sense of the complexity of affairs, to underestimate both the relevance and the significance of those wishes. We are so impressed by the plain man's ignorance that we tend to think his views may be put aside as unimportant. Not a little of the literature upon the art of government to-day is built upon the supposition that the plain man has no longer any place in social economy. We know, for example, that he does not understand the technicalities of the gold standard. It is clear that it would be folly to consult him upon matters like the proper area for the generation of electricity supply, or the amount that it is wise for a government to spend in testing the action of pavements under changing temperatures and variations of load. But the inference from a knowledge that the plain man is ignorant of technical detail and, broadly speaking, uninterested in the methods by which its results are attained, is certainly not the conclusion that the expert can be left to make his own decisions.

For the results of the gold standard are written plain in the life of the average man. The consequences of an inefficient electricity supply are apparent to him every day. It is his motor car which uses the roads, and he makes up his mind about the quality of the road-service with which he is provided. Every degree by which he is separated from consultation about decisions is a weakening of the governmental process. Neither goodwill in the expert nor efficiency in the performance of his function ever compensates in a state for failure to elicit the interest of the plain man in what is being done. For the nature of the result is largely unknown save as he reports his judgment upon it; and only as he reports that judgment can the expert determine in what direction his plans must move. Every failure in consultation, moreover, separates the mind of the governors from those who are governed; this is the most fertile source of misunderstanding in the state. It is the real root of the impermanence of autocracies which fail from their inability to plumb the minds of those by whose opinions, ultimately, they must live.

The importance of the plain man's judgment is, in short, the foundation upon which the expert, if he is to be successful, must seek to build. It is out of that judgment, in its massive totality, that every society forms its scheme of values. The limits of possible action in society are always set by that scheme. What can be done is not what the expert thinks ought to be done. What can be done is what the plain man's scheme of values permits him to consider as just. His likes and dislikes, his indifference and his inertia, circumscribe at every stage the possibilities of administration. That is why a great expert like Sir Arthur Salter has always insisted upon the importance of advisory committees in the process of government. He has seen that the more closely the public is related to the work of *expertise*, the more likely is that work to be successful. For the relation of proximity of itself produces conviction. The public learns confidence, on the one hand, and the expert

learns proportion on the other. Confidence in government is the secret of stability, and a sense of proportion in the expert is the safeguard against bureaucracy.

At no time in modern history was it more important than now that we should scrutinize the claims of the expert more critically; at no time, also, was it more important that he himself should be skeptical about his claims. Scientific invention has given us a material power of which the possible malignancy is at least as great as its contingent benefits. The danger which confronts us is the quite fatal one that, by the increase of complexity in civilization, we may come to forget the humanity of men. A mental climate so perverted as this would demonstrate at a stroke the fragility of our social institutions. For it would reveal an abyss between rulers and subjects which no amount of technical ingenuity could bridge. The material power that our experts multiply brings with it no system of values. It can only be given a system related to the lives of ordinary people to the degree that they are associated with its use. To exclude them from a share in its direction is quite certainly to exclude them also from a share in its benefits; for no men have been able in the history of past societies exclusively to exercise its authority without employing it ultimately for their own ends. Government by experts would, however ardent their original zeal for the public welfare, mean after a time government in the interest of experts. Of that the outcome would be either stagnation, on the one hand, or social antagonism, upon the other.

IV

Our business, in the years which lie ahead, is clearly to safeguard ourselves against this prospect. We must ceaselessly remember that no body of experts is wise enough, or good enough, to be charged with the destiny of mankind. Just because they are experts, the whole of life is, for them, in constant danger of being sacrificed to a part; and they are saved from disaster only by the need of deference to the plain man's common sense. It is, I believe, upon the perpetuation of this deference that our safety very largely depends.

But it will be no easy thing to perpetuate it. The expert, to-day, is accustomed to a veneration not very different from that of the priest in primitive societies; for the plain man he, like the priest, exercises a mystery into which the uninitiated cannot enter. To strike a balance between necessary respect and skeptical attack is a difficult task. The experience of the expert is so different, his approach to life so dissimilar, that expert and plain man are often impatient of each other's values. Until we can somehow harmonize them, our feet will be near to the abyss.

Nor must we forget that to attain such harmony immense changes in our social habits will be necessary. We shall have to revolutionize our educational methods. We shall have to reconstruct the whole fabric of our institutions. For the first time, perhaps, in the history of mankind, we shall have, as a civilization, deliberately to determine what kind of life we desire to live. We must so determine it remembering that the

success of our effort will depend upon harnessing to its fortunes the profounder idealism of ordinary men and women. We shall appeal to that idealism only as we give it knowledge and persuade it that the end we seek is one in which it, too, can hope to share.

[From *Together, Annals of an Army Wife*, Tupper and Love, Inc., 1946]

THE BIRTH OF THE JEEP

By Katherine Tupper Marshall

During this expansion of the Army so many thousands of new ideas and inventions were sent to the War Department that it was difficult to separate the wheat from the chaff. These did not come to General Marshall until they had been passed on by experts of the Department; but it was his responsibility to make the final decision. He was on the alert constantly not to miss anything that would further the efficiency of the Army. His immediate Staff had access to his office at all times but there was nothing that annoyed him more than to have one of them open the door, look in, and seeing he was busy, back out. To prevent this he had a notice put on his office door, "Once you open this door, WALK IN, no matter what is going on inside." Often he would not look up until he had finished what he was doing and then he would ask, "What is it?"

One day Colonel Bedell Smith, then Secretary of the General Staff—now Ambassador to Russia—opened the door, but seeing several generals talking with General Marshall, started to back out when George said, rather irritably, "Come in, Smith. Didn't you see that sign?" He paused in his conference and turned to Colonel Smith, "Now, what is it?" Colonel Smith explained that there was a man in his office whom he would like General Marshall to see. This man had come to Washington weeks before, with the drawings of a small, sturdy car which he wished to offer to the Government for a test. He had been sent from one person to another. No one was interested, and the inventor, angry and discouraged, had appealed to the Secretary of the General Staff as a last resort.

After talking to him for some time and going over his drawings, Colonel Smith was convinced that he had something well worth while. "General, I wish you would see this man. He is right outside." George asked a few questions, then said, "Did you go over the plans thoroughly?"

"Yes, Sir."

"What was your reaction?"

"That he has a find."

"Well, that is enough for me. Order one."

"But, General," Colonel Smith protested, "one car is not sufficient for a test, we should have at least fifteen."

"Can you find the money, Smith?"

"Yes," said Colonel Smith. "They will cost about \$12,000."

“Very well,” replied General Marshall. “Do it.”

This was the birth of the famous Jeep now familiar to all the world. The discussion had lasted about three minutes. The most interesting phase of the matter was the disinclination of the Armored Forces, then in its infancy, and other arms to test the completed models. Yet three weeks later they recommended an initial order for 39,000!

[From Vols. II and IV, *The Second World War*, by Winston S. Churchill, Houghton Mifflin Company]

THE FALL OF SINGAPORE

By Winston S. Churchill

FROM *Their Finest Hour* (1949)

Each of our ports on the east and south coasts was a special study. Direct frontal attack upon a defended port seemed an unlikely contingency, and all were made into strong-points equally capable of defence from the landward or the seaward side. It astonishes me that when this principle of fortifying the gorges was so universally accepted and rigorously enforced by all military authorities at home, no similar measures were adopted at Singapore by the succession of high officers employed there. But this is a later story.

FROM *The Hinge of Fate* (1950)

It soon became clear that General Wavell had already doubts of our ability to maintain a prolonged defence of Singapore. The reader will have seen how much I had counted upon the island and fortress standing a siege requiring heavy artillery to be landed, transported, and mounted by the Japanese. Before I left Washington I still contemplated a resistance of at least two months. I watched with misgivings but without effective intervention the consumption of our forces in their retreat through the Malay peninsula. On the other hand, there was the gain of precious time.

General Wavell to Chiefs of Staff

14 Jan. 42

Flew [to] Singapore yesterday, January 13, and motored [to] Segamat to meet Heath and Gordon Bennett. Plan is being carried out, but 9th and 11th Divisions have been further weakened both in numbers and morale by the fighting north of Kuala Lumpur, and enemy's advance has been more rapid than I had hoped. Battle for Singapore will be a close-run thing, and we shall need luck in getting in convoys safely and up to time. Continuous heavy rain all yesterday sheltered important convoy in final approach and may help to delay enemy. Gordon Bennett and Australians in good heart and will handle enemy roughly, I am sure.

* * * * *

In order to make sure about the landward defences, which hitherto I had taken for granted, and the preparation for standing a siege, I sent the following telegram:

Prime Minister (Washington) to General Wavell 15 Jan. 42

Please let me know your idea of what would happen in event of your being forced to withdraw into the island.

How many troops would be needed to defend this area? What means are there of stopping landings as were made in Hong Kong? What are defences and obstructions on landward side? Are you sure you can dominate with fortress cannon any attempt to plant siege batteries? Is everything being prepared, and what has been done about the useless mouths? It has always seemed to me that the vital need is to prolong the defence of the island to last possible minute, but of course I hope it will not come to this. . . .

3. Everyone here is very pleased with the telegrams you have sent, which give us all the feeling how buoyantly and spaciouly you are grappling with your tremendous task. All the Americans seem to have the same confidence in you as have your British friends.

Wavell's reply to this message did not reach me till after my return to London.

General Wavell to Prime Minister 16 Jan. 42

I discussed the defence of island when recently at Singapore, and have asked for detailed plans. Until quite recently all plans were based on repulsing seaborne attacks on island and holding land attack in Johore or farther north, and little or nothing was done to construct defences on north side of island to prevent crossing Johore Straits, though arrangements have been made to blow up causeway. The fortress cannon of heaviest nature have all-round traverse, but their flat trajectory makes them unsuitable for counterbattery work. Could certainly not guarantee to dominate enemy siege batteries with them. Supply situation satisfactory. Have already authorised removal of certain Air Force establishments and stores to Sumatra and Java to prevent congestion. Will cable further when I receive detailed plans. Much will depend on air situation.

It was with feelings of painful surprise that I read this message on the morning of the 19th. So there were no permanent fortifications covering the landward side of the naval base and of the city! Moreover, even more astounding, no measures worth speaking of had been taken by any of the commanders since the war began, and more especially since the Japanese had established themselves in Indo-China, to construct field defences. They had not even mentioned the fact that they did not exist.

All that I had seen or read of war had led me to the conviction that, having regard to modern fire-power, a few weeks will suffice to create strong field defences, and also to limit and canalise the enemy's front of attack by minefields and other obstructions. Moreover, it had never entered into my head that no circle of detached forts of a permanent character protected the rear of the famous fortress. I cannot understand how it was I did not know this. But none

of the officers on the spot and none of my professional advisers at home seem to have realised this awful need. At any rate, none of them pointed it out to me—not even those who saw my telegrams based upon the false assumption that a regular siege would be required. I had read of Plevna in 1877, where, before the era of machineguns, defences had been improvised by the Turks in the actual teeth of the Russian assault; and I had examined Verdun in 1917, where a field army lying in and among detached forts had a year earlier made so glorious a record. I had put my faith in the enemy being compelled to use artillery on a very large scale in order to pulverise our strong points at Singapore, and in the almost prohibitive difficulties and long delays which would impede such an artillery concentration and the gathering of ammunition along Malayan communications. Now, suddenly, all this vanished away and I saw before me the hideous spectacle of the almost naked island and of the wearied, if not exhausted, troops retreating upon it.

I do not write this in any way to excuse myself. I ought to have known. My advisers ought to have known and I ought to have been told, and I ought to have asked. The reason I had not asked about this matter, amid the thousands of questions I put, was that the possibility of Singapore having no landward defences no more entered into my mind than that of a battleship being launched without a bottom. I am aware of the various reasons that have been given for this failure: the preoccupation of the troops in training and in building defence works in Northern Malaya; the shortage of civilian labour; pre-war financial limitations and centralised War Office control; the fact that the Army's rôle was to protect the naval base, situated on the north shore of the island, and that it was therefore their duty to fight in front of that shore and not along it. I do not consider these reasons valid. Defences should have been built.

[From Address at launching of the *Polaris* submarine *George C. Marshall*,
Newport News, May 21, 1965]

THE ACHESON-BRADLEY TREATY

By Dean Acheson

Today it seems plain that the responsibilities of the Departments of State and Defense are as inter-related as their problems are different facets of the same problem. Yet it may surprise you to know that not until the end of 1950, when General Marshall was Secretary of Defense, had the Secretary of State with his senior aides ever sat down with the Secretary of Defense and the Chiefs of Staff to take counsel on a common problem—then the situation in Korea.

In the course of those meetings General of the Army Omar Bradley, Chairman of the Joint Chiefs of Staff, and the Secretary of State entered into a secret treaty. They agreed that henceforth between them the phrases, "from a purely military point of view" and "from a purely political point of view", would be forbidden as utterly meaningless.

[From *Government and Science*, Oxford University Press, 1962]

THE SCIENTIST IN GOVERNMENT

By Don K. Price

A science itself cannot tell how its own data are to be used. Its findings cannot be taken undiluted by top political authorities, any more than a scientist's invention can ever be produced by industry just as the scientist invented it. In private industry an invention has first to be developed into a workable product by the engineers; next the production engineers have to make it suitable for mass output by designing it to fit, so far as possible, the machine tool and production facilities already available; and simultaneously it has to be designed so as to fit in with the company's sales program. This is only a pale counterpart of the problem in government, which must decide on the use of any major scientific development in the light of an immense range of policy considerations—social, economic, political, and perhaps military and diplomatic.

This is a problem partly for the engineer and partly for the administrator—both the line administrator who makes decisions more or less on his own and the staff man who shapes up issues for decision by a higher executive. The engineer and the administrator provide an essential layer in the pyramid of government, below the peak of political authority, and above the level at which science must operate . . .

The budget, of course, is only one of a number of methods by which the administrator creates a program out of an infinite variety of ill-assorted facts and random possibilities. This is not a feat of individual brilliance, but of group competence; for a group to develop competence, it has to have some continuity and some stability. The reason why civilian scientists are often frustrated in their relation with the military is that the military, with all its faults, does have such continuity and group competence and is not adequately counterbalanced by any corresponding organization or career service on the civilian side of government.

The personnel system of the United States government does not even recognize the need for such an administrative service. Under its rules of civil service classification there is no arrangement for a corps of generalists to deal with the major issues of policy; the administrative officer, indeed, has to justify his existence by making his work into something like a technical specialty or pseudo science. In this respect, of course, government in America simply follows the example of society as a whole, which in business and in education has glorified the specialties and neglected the over-all problem of developing the generalist. When I speak of the administrator and his function I am not thinking of him as he is defined for civil service purposes by the classification experts. That kind of administrator and his function are only an inferior kind of specialty. I am thinking instead of the function described by Brooks Adams:

Administration is the capacity of co-ordinating many, and often conflicting, social energies in a single organism, so adroitly that they shall operate as a unity. . . . Probably no very highly specialized class can be strong in this intel-

lectual quality because of the intellectual isolation incident to specialization; and yet administration or generalization is not only the faculty upon which social stability rests, but is, possibly, the highest faculty of the human mind.*

Many scientists, especially those from universities, never feel the need for such a function. The purpose of organization and administration in a university is mainly to care for the material needs of a collection of independent disciplines. There have been some ambitious efforts to bring them together in the name of general education, but the going has been rough. On the other hand, in public affairs (including the great foundations as well as government) the administrator is not motivated by a merely philosophical purpose: he sees the need for stamping out hookworm or the boll weevil; he sees the need for an improved system of communications; he sees the need for an effective system of air defense. And it is his job to marshal the forces of science into an effective program and to keep them from going off into the entirely different directions of their several disciplines and specialties. Unless this essential job of the administrator is done, the whole program of government will not become coherent enough to be controlled by the political authorities who in turn are responsible to the people.

But if science, as such, cannot give us automatic answers to our great issues of public policy, that does not mean that scientists cannot play an important role in answering them. The administrator and the scientist are not two quite different categories of people. Indeed, it seems to me that the whole history of American government shows that the scientist and the engineer have often moved successfully into many of the most responsible and difficult administrative positions. In this respect American government has had an experience similar to that of American private business.

On the aspects of administration that are managerial in the narrow sense of the word, the scientist whose only experience has been the laboratory is often poorly prepared. Moreover, he is likely to dismiss as unimportant those aspects of an administrative job that have to do with keeping the organization and procedures in good repair and keeping the majority of the staff satisfied with their work. The reason may be that he is tempted by force of mental habit to concentrate on those aspects of his job that are most interesting to the individual student as intellectual problems—a temptation which the administrator usually cannot afford to yield to.

These considerations argue, it seems to me, for having a few men with quite general administrative background in the top ranks of even those agencies with heavily scientific programs. On the other hand, I would argue with equal emphasis that the administrative personnel of almost all agencies ought to have a fair proportion of men with some training and experience in science and engineering. If administration is to serve as a useful layer in the pyramid of policy between the peak of political power and the base of science and technology, it needs in its composition an appropriate mixture of general competence and special knowledge.

Many policy problems that cannot be solved precisely by scientific research can in practice be solved satisfactorily only by men with

*Brooks Adams, *The Theory of Social Revolutions* (New York: The Macmillan Company, 1913), pp. 207-8.

scientific knowledge as well as administrative ability. In military affairs, for example, there are many issues on which it is not practical to look to operations research for the answers, but which cannot be handled properly without the kind of judgment that comes from scientific background. The Canadian government recognized this principle when it made its leading civilian scientist a member of its equivalent of the Joint Chiefs of Staff. The scientist should take a part as a responsible administrator, right up to the highest levels, in making decisions that cannot be based entirely on objective research, and on which no irresponsible adviser can ever expect to be consulted.

In the administrative corps some mixture of general and special qualifications is desirable. In the long run, however, a mere mixture of unrelated skills is not what is needed. What is needed is a corps of men whose liberal education includes an appreciation of the role of science and technology in society and whose scientific education has not been a narrowly technical or vocational one, but has treated science as one of the highest intellectual endeavors of men who also have responsibility as free citizens. The humanities and the social sciences are too often taught in America as narrowly technical subjects. We can hardly find a new generation of administrative generalists on them as they are commonly taught today . . .

It would be comforting to hope that in the long run the development of science, especially of the social sciences, will let us solve all human problems by the scientific method. But this is not a prospect that seems possible in theory, to say nothing of its being likely in practice.

We need not hang onto this hope in order to further the development of science. For there are plenty of worlds for the scientist to conquer. And he may have an even better chance to get on with his job if all of us realize that the major policy decisions on which society depends must be made only partly on the basis of the exact quantitative data that scientific research can provide. For then we can all understand the necessity of creating the kind of responsible political and administrative systems within which free science will have its fullest opportunity for public service.

[From Memorandum, Senate Subcommittee on National Security Staffing and Operations, 88th Cong., 1st sess., Hearing, September 18, 1963]

SPECIALIST VS. GENERALIST IN THE FOREIGN SERVICE

By Samuel D. Berger

This subject has been endlessly debated, but I have long felt that the argument was more theoretical than real. The great need in overseas work is for more people of the highest quality to fill senior officer positions: deputy chief of mission, political and economic counselors, consul general, and special assistant on aid matters. There are certain requirements at the senior level: great energy; passionate interest in the work; mature judgment in foreign affairs that comes only with

long and varied experience in the Foreign Service; the capacity to lead and inspire staff; insistence on precision in all parts of the work; a liking for working in foreign countries with all its interest as well as disadvantages; a capacity to adjust to change; and a capacity to win the respect, and, hopefully, the affection of his colleagues and the people of the countries in which he serves. These do not exhaust the list of requirements, but they are among the main ones. Officers who do not possess these qualities should be kept from appointment to senior positions, or weeded out, if they occupy them, in order to make room for topflight officers.

It is not whether a man is a generalist or specialist that brings him to the top, but whether he has capacity, breadth, interest, and initiative—what we call “flair.” I have known agricultural, commercial, labor, and treasury attachés who do a fine routine job in their special fields to which no one can take exception. But the specialist with “flair” can make a contribution to the work of an embassy that goes far beyond his field. For example, an agricultural attaché in the normal course of his work has the opportunity to meet farmers and peasants, develop contacts with agricultural leaders, civil servants working on agricultural matters, managers of agricultural banks and cooperatives, etc. If he sees his job in its widest context, he can in the course of his routine work on crops, prices, marketing, etc., develop invaluable information and reports on the economic and social conditions of farmers, peasants, and farm laborers; on their political attitudes and organizations; on the effect of general economic or finance policy on agriculture; on the relation of the farm community to the whole gamut of society. In short, he can use his specialty to illuminate for the benefit of the embassy all manner of political, economic, and social problems. The same is true of the commercial attachés, labor attachés, treasury attachés, and others.

The broader the interest of the specialist, the greater his capacity and initiative, the more he can contribute to the operations of an embassy and the higher he can aspire in the Foreign Service.

Conversely, the senior generalist who is familiar with all problems but has failed to develop a deep and critical grasp of any of the major fields will lack the self-confidence required to make independent judgments, evaluations, and decisions that he is called on to make week in and week out in a variety of fields. In these days the senior generalist working abroad must have a sufficiently extensive knowledge of economics, labor, agriculture, aid programs, and Communist history, doctrine, and methods—to cite some of the more important areas—or he will be at a great disadvantage in dealing with the complicated problems which confront most embassies.

Stated in another way, the great need in the Foreign Service is for more officers at the top—whether they are generalists or specialists—who have drive and the kind of experience that enables them to relate one field to another. The Foreign Service has many bright and hard working specialists and generalists: what it needs is to select, encourage, guide, and train the most promising for appointment to the senior positions.

[From Address at United States Military Academy, West Point, New York,
May 2, 1964, upon receipt of the Sylvanus Thayer Award]

THE CHANGING MILITARY PROFESSION

By Robert A. Lovett

In this center of military education which, under Sylvanus Thayer, became the fountainhead of American technology, I would like to take note of the increasing tempo of the revolution now taking place in military professionalism and, with your indulgence, make a few observations on it. . . .

The military profession is currently experiencing so rapid a change it can fairly be called a revolution—particularly since it has some internecine characteristics. Some unsung modern Thayers have seen the wider horizons which must now concern the professional military officer with the result that the Army curriculum already reflects increased emphasis on non-military areas of study and on post-graduate work. This is, of course, a response to the dilemma which confronts all professional men; namely, that there is “much too much they need to know and too little time in which to learn it.” Dr. Vannevar Bush, of Massachusetts Institute of Technology, says “the doctor, the architect, or the chemist cannot possibly know all he needs to know for his professional work. Hence, he needs to know how he can find out. More important, he needs to be able—genuinely, honestly and generously—to collaborate with those who know more than he on diverse aspects of problems as they arise.”

In the difficult professional career on which you have already embarked, you will never be finished with learning. Indeed, it seems clear that demands on you in the future will be more varied, responsibilities heavier and the need for breadth of training and experience greater because decision-making today involves the use of a wider diversity of special skills and knowledge than ever before. Much of the decision-making is in fields where there is no tested, actual experience. Much of it is a question of assessing economic, social, political and ideological considerations.

In the Cold War, the devising of proper action depends on the contribution of many types of experts—not just one. The military professional is a most important contributor to the discussions of our problems for a reason not always recognized by the government and the public he serves. The professional career officer, owing to his skills and his commitments, accepts a higher degree of responsibility than other citizens and voluntarily gives up certain of the privileges of a private citizen. You serve in an ancient profession with special disciplines because, as Lieutenant General Sir John Hackett has said, “the function of the profession of arms is the ordered application of force to the resolution of a social problem.”

This fact places you in a unique category of public servants and in a most select rank of profession. Because of the nature of your duties and responsibilities, you are, in effect, trustees and custodians of the armed power of the American people. You are, therefore, in a fiduciary relationship by reason of having this awesome power entrusted to you. No greater evidence of confidence and faith could be reposed in you. No greater compliment could be paid you.

Military advice is only one—although, on occasion, the most necessary—type of guidance needed today and the decision-making process involves a system of checks and balances in the Executive Branch

deliberately designed to keep any one economic or social group or any one governmental department from becoming dominant. Therefore, every judgment made at the decisive level requires a weighing of several often-conflicting and competing factors.

For these reasons, the ability of the military expert to give wise advice—and to get it listened to by policy-making officials—depends in great measure on his possessing knowledge in key nonmilitary fields and in seeing issues in broad perspective. For example, the military expert should be able to spot instantly the phony or slanted economic theory or financial policy advanced in arguments. He must, of course, be adequately prepared to look askance at any exaggerated claims—whether for a weapon or a course of action—even when made in the exalted name of “scientific methods.” It might, in such cases, be useful to remember the rather sly question, attributed to some doubting disciples, as to whether scientific methods applied to horse breeding to improve transportation could ever have produced the modern automobile engine. After all, human will, creativeness and talent must be given credit for something by somebody.

Furthermore, the military officer should be ready to identify and evaluate the impact of the swings in politico-social emotions and fashions which are so frequently the affliction of our national security and foreign policy. It is these factors which so largely influence us and produce those weird reversals and grotesque lurches that give us a policy often referred to as “crisis oriented” but which can, I think, be more accurately described as the “Yo-yo system”—that is, you throw it away one minute and snatch it back the next.

In short, the military career officer must be highly skilled in his own profession, but he cannot afford to become trapped in narrow professionalism. Nor, indeed, can his country permit him to do so.

General Eisenhower—a most distinguished predecessor in the Thayer Award—in his farewell message as President made a statement strangely overlooked by most commentators—who pounced so eagerly on his reference to the dangers of a “military-industrial complex”—yet neglected advice of equal or greater weight. He wisely—and also pointedly—said “in holding scientific research and discovery in respect, as we should, we must also be alert to the equal and opposite danger that public policy could itself become the captive of a scientific-technological elite.”

The noted British writer, C. P. Snow, himself an eminent scientist, similarly warned against the danger of a scientific overlord—against a scientist in a position of isolated power.

What is true of the scientist is true of the military expert. It is not the unwarranted *power* of the scientist or of the military officer or of any other expert that is now cause for our concern. *Isolation* is what creates the real problem—that is, power insulated from competing skills or the claims of other groups for recognition of possible alternative courses of action. Consequently, if “knowledge is power”, as the old axiom tells us, then *insulated knowledge* fails to meet fully our needs in the making of public policy.

I believe the time has come for a new Thayer-like break-out from the relatively narrow concept of the military profession and rigid doc-

trines held by my generation into studies of wider scope. In particular, we must develop a faster response to the technological and scientific revolution with its resulting impact on strategy and doctrine. I am convinced that this extension of proper military concern can best be built on the firm foundation of the military sciences and of the discipline and high standards of character based on the great traditions of this magnificent military Academy and those of its sister services. For the virtues nourished here are your priceless inheritance from The Long Gray Line and must remain one of the few unchanging values in a radically changing world.

I submit, gentlemen, that only an expanding mind can deal with a world of expanding complexities; and that broadening your horizons will not diminish the value of your special military skills but will, on the contrary, enhance their validity and usefulness in those great Councils of Government where, as servants of the Republic, you will sit as keepers of the faith and guardians of the peace.

[From *Annual Report 1965*, Carnegie Corporation of New York]

SOME MALADIES OF LEADERSHIP

By John W. Gardner

FAILURE TO COPE WITH THE BIG QUESTIONS

Nothing should be allowed to impair the effectiveness and independence of our specialized leadership groups. But such fragmented leadership does create certain problems. One of them is that it isn't anybody's business to think about the big questions that cut across specialties—the largest questions facing our society. Where are we headed? Where do we *want* to head? What are the major trends determining our future? Should we do anything about them? Our fragmented leadership fails to deal effectively with these transcendent questions.

Very few of our most prominent people take a really large view of the leadership assignment. Most of them are simply tending the machinery of that part of society to which they belong. The machinery may be a great corporation or a great government agency or a great law practice or a great university. These people may tend it very well indeed, but they are not pursuing a vision of what the total society needs. They have not developed a strategy as to how it can be achieved, and they are not moving to accomplish it.

One does not blame them, of course. They do not see themselves as leaders of the society at large, and they have plenty to do handling their own specialized role.

Yet it is doubtful that we can any longer afford such widespread inattention to the largest questions facing us. We achieved greatness in an era when changes came more slowly than now. The problems facing the society took shape at a stately pace. We could afford to be slow in recognizing them, slow in coping with them. Today, problems of enor-

mous import hit us swiftly. Great social changes emerge with frightening speed. We can no longer afford to respond in a leisurely fashion.

Our inability to cope with the largest questions tends to weaken the private sector. Any question that cannot be dealt with by one of the special leadership groups—that is, any question that cuts across special fields—tends to end up being dealt with by government. Most Americans value the role played by nongovernmental leadership in this country and would wish it to continue. In my judgment it will not continue under the present conditions.

The cure is not to work against the fragmentation of leadership, which is a vital element in our pluralism, but to create better channels of communication among significant leadership groups, especially in connection with the great issues that transcend any particular group.

FAILURE OF CONFIDENCE

Another of the maladies of leadership today is a failure of confidence. Anyone who accomplishes anything of significance has more confidence than the facts would justify. It is something that outstanding executives have in common with gifted military commanders, brilliant political leaders, and great artists. It is true of societies as well as of individuals. Every great civilization has been characterized by confidence in itself.

Lacking such confidence, too many leaders add ingenious new twists to the modern art which I call "How to reach a decision without really deciding." They require that the question be put through a series of clearances within the organization and let the clearance process settle it. Or take a public opinion poll and let the poll settle it. Or devise elaborate statistical systems, cost-accounting systems, information-processing systems, hoping that out of them will come unassailable support for one course of action rather than another.

This is not to say that leadership cannot profit enormously from good information. If the modern leader doesn't know the facts he is in grave trouble, but rarely do the facts provide unqualified guidance. After the facts are in, the leader must in some measure emulate the little girl who told the teacher she was going to draw a picture of God. The teacher said, "But, Mary, no one knows what God looks like"; and Mary said, "They will when I get through."



Memoranda and Hearings

PLANNING-PROGRAMMING-BUDGETING

PPBS AND FOREIGN AFFAIRS

MEMORANDUM

PREPARED AT THE REQUEST OF THE
SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS

(Pursuant to S. Res. 54, 90th Cong.)

OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE



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INTRODUCTORY NOTE

The subcommittee is pleased to include this memorandum by Dr. Thomas C. Schelling in the record of its study on planning-programming-budgeting in the national security departments and agencies.

We requested Dr. Schelling to prepare a statement covering the main points on PPBS in relation to foreign affairs which he thought we should consider and reflect upon in the course of our inquiry, and he has responded with this thoughtful contribution.

Dr. Schelling is Professor of Economics and Member of the Faculty of Public Administration at Harvard University. Student of foreign policy in the nuclear age and author of *Arms and Influence* (1966), he serves as consultant to the Departments of State and Defense and to the Arms Control and Disarmament Agency.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

JANUARY 5, 1968.

PPBS AND FOREIGN AFFAIRS

By

Thomas C. Schelling

I respond with diffidence, as anyone must, to your invitation to comment on PPBS in relation to foreign affairs. Foreign affairs is a complicated and disorderly business, full of surprises, demanding hard choices that must often be based on judgment rather than analysis, involving relations with more than a hundred countries diverse in their traditions and political institutions—all taking place in a world that changes so rapidly that memory and experience are quickly out of date. Coordination, integration, and rational management are surely desirable; but whether it is humanly possible to meet anything more than the barest minimum standards is a question to which an optimistic answer can be based only on faith.

PPBS AS A TOOL OF EVALUATION

Furthermore, PPBS is a method or procedure whose worth depends on the skill and wisdom of the people who use it. Identifying coherent objectives, relating activities to objectives, identifying costs with activities, comparing alternatives, and weighing achievements against costs, are bound to be unimpeachable activities if properly done. But human ingenuity is so great that hidden assumptions can be introduced into any analysis, benefit of the doubt can be prejudicially awarded, quantitative data can be subtly made prominent to the detriment of important qualitative considerations, and even the objectives themselves can be gathered into the wrong packages. The success of PPBS in the Department of Defense over the past half-dozen years—and I think there can be no doubt that the system has been a great success—may be due as much to the quality of the people engaged, and their confidence in each other, as to the logic of the system.

I should like to emphasize something that is implicit in the testimony you heard from both Charles Schultze, Director of the Budget, and Alain Enthoven, Assistant Secretary of Defense (Systems Analysis), but that they perhaps made too little explicit. PPBS, backed up by a competent analytical staff, can hardly fail to be helpful to a decision-maker who insists on making his own decisions and on understanding how he makes them; it can be a seductive comfort, and in the end an embarrassment, to a lazy executive who wants his decisions to come out of a process in which his own intellect does not participate. PPBS can be a splendid tool to help top management make decisions; but there has to be a top management that wants to make decisions.

Let me use an analogy, if I may. A court-room adversary proceeding has been evolved as a comparatively good way to provide the judge

in the dispute with the arguments and evidence on which to base a decision; but the crucial element in the proceedings is the judge himself. Systems analysis and other modern techniques of evaluation require a consumer, some responsible person or body that wants an orderly technique for bringing judgment to bear on a decision. PPBS works best for an aggressive master; and where there is no master, or where the master wants the machinery to produce his decisions without his own participation, the value of PPBS is likely to be modest and, depending on the people, may even be negative.

A third point I would emphasize is that PPBS works best, and historically has been mainly applied, in decisions that are largely budgetary. Budgetary choices are typically choices among *good* things, some of which are better than others, when there are limits on what things or how much of them one can have. The questions are not, "What is good?" but, "Which is better?," not whether more is better than less, but whether it is enough better to be acquired at the expense of something else. A budgetary proposal never arises in the first place unless someone thinks it has merit. A bad budgetary judgment is usually—not always, but usually—bad in proportion to the money that is wasted; there are probably few things that the military services have proposed for purchase that would not have been worth having if they were free of charge.

Outside the budget, big mistakes are cheaper.

It is noteworthy that your committee, in questioning Secretary Enthoven about the sufficiency of bombs for bombing missions in Vietnam, did not ask what PPBS would say about a bombing truce, or the bombing of targets in Cambodia. These are not decisions for which money or economic resources are the main considerations. Having more bombs than necessary is bad only because they cost money; using bombs, or failing to use them, can be bad irrespective of what the bombs cost.

In foreign affairs, more of the hard decisions are of this non-budgetary sort. That is, bad decisions are not merely wasteful of money; and good decisions do not merely promote efficiency. Even in defense there are plenty of decisions that are not mainly budgetary; the defense budget, though, is so big that the scope for good budgetary practice is ample, and no one can deny the significance of PPBS if it "merely" helps to spend 50 or 75 billion dollars per year more sensibly.

In foreign affairs, quite broadly defined, annual expenditure is about a tenth of that. The Director of the Budget cited a figure of 5.6 billion dollars to your committee, exclusive of expenditures on military forces and intelligence. No one will claim, I am sure, that decisions made in the field of foreign affairs are only one-tenth as important as those made in the field of military affairs; and indeed a good many of the non-procurement decisions in the field of military affairs can be construed as a specialized part of foreign affairs.

I shall not question the worth of being more efficient in the use of 5 billion dollars, even though the amount seems small compared with the defense budget. Furthermore, those of us who think that foreign affairs sometimes receives stingy treatment in Congressional appropriations, compared with defense procurement, must be especially concerned that scarce resources not be wasted. Nevertheless, few among us—and I suspect I can include most of your subcommittee here—when we think about the management of foreign affairs, have an overriding concern with how the 5.6 billion dollars gets spent. Money is

not the primary consideration in nuclear proliferation, recognition of the Greek military regime, or new commitments to Thailand. Your committee's interest in the Skybolt affair indicates, furthermore, your concern that PPBS, being focused on costs and other "tangibles," may even divert attention from those elements of a decision, sometimes dominant elements, that cannot be translated straightforwardly into budgetary terms.

There is consequently genuine concern that PPBS and other techniques of management that are essentially budgetary or quantitative may be not only of less positive value when applied to foreign affairs but even, through their tendency to distort criteria and to elevate particular kinds of analytical competence, to be of positive harm. A rather striking manifestation of this concern is the extreme reluctance with which any among us, including perhaps your committee and the Director of the Budget, approach the question of whether the Central Intelligence Agency is part of "foreign affairs" and ought to be subject not only to similar program planning but to the same process of planning, programming, and budgeting.

I believe the spirit of PPBS, even some of its most familiar techniques, is as much needed in handling non-quantitative and non-budgetary "costs" as in the more traditional budgeting; the "costs" of, say, meeting certain objectives in Jordan or India may be the sacrifice of certain objectives in Egypt, Algeria, Israel or Pakistan, and the disciplined judgment that PPBS demands may prove an advantage. The estimates will have a higher component of judgment in them, a lesser component of organized data; at the same time, the temptation to hope, or to pretend, that the "system" gives answers, instead of merely providing the framework for disciplined judgment and confrontation, will be correspondingly smaller.

PPBS AS A MEANS OF CONTROL

My fourth general observation is that any discussion of PPBS is unrealistic unless it is acknowledged that budgetary processes are a means of control, as well as a means of evaluation. Secretary McNamara surely did not use PPBS and other techniques of financial management merely to cut waste and to improve efficiency or to save money. He took advantage of his central role in the defense-budgeting process to exercise what he believed to be his authority over military policy. Some people have more instinct than others, or better training than others, for using the purse strings as a technique of management and a source of authority; but almost anyone concerned with administration sooner or later discovers that control of budgetary requests and disbursements is a powerful source of more general control. (This is true of universities as well as government agencies.) Anything that makes budgeting more effective will add to the authority of those involved in the budgeting. Budgetary procedures provide invaluable opportunities for holding hearings, demanding justifications, spot-checking the quality of planning, identifying objectives, and even enhancing competition among lethargic subgroups. Furthermore, the budgetary process being geared to an annual cycle, it provides a regular and systematic way of repeatedly examining into these subjects.

My own experience was quite vivid. In 1951 Congress passed the Mutual Security Act. All aid funds were appropriated to the President, who could delegate authority to the Director for Mutual Security. Appropriations for all aid programs were first authorized and then appropriated in a single Act, the titles of which were differentiated by region, not by agency or program. Both in going up to the Hill, through the Budget Bureau and the President, and in getting apportionments of appropriated funds, the several operating agencies were subject to coordination by the Director for Mutual Security. An extraordinary degree of centralized coordination occurred. It was accomplished by a small staff working closely with the Bureau of the Budget. The extent of coordination was undoubtedly more satisfying to the coordinators than to the coordinated; but there can be no question that coordination occurred, and that it occurred precisely because the Director for Mutual Security was put directly at the center of the budgetary process.

This is important. It means that in talking about enhancing the budgetary effectiveness of the Secretary of State or his Office, we are talking about enhancing much more than that. A real test of whether an aid program, an information service, an agricultural program, an intelligence activity or a peace corps is subordinated to the executive authority of the Secretary of State is whether, and how aggressively, he exercises authority over their budgets. (His authority over their personnel ceilings would be a second such test.) I have no doubt that the coordinating role of the State Department in respect of foreign aid would have been greatly enhanced, perhaps permanently so, had the Mutual Security Act of 1951 given budgetary authority to the Secretary rather than to a Director for Mutual Security. (And I have little doubt that the Congress knew exactly what it was doing.)

THE QUESTION OF A FOREIGN AFFAIRS BUDGET

My fifth and final observation about PPBS and foreign affairs—and the one most directly related to whether the experience in Defense could be translated into the State Department—is that the budget does not yet exist to which PPBS might be applied in the field of foreign affairs. When Secretary McNamara assumed office, he was at least fifteen years ahead of where the Secretary of State is now in having a recognized budget. There is a "Defense Budget"; there is not a "Foreign Affairs Budget." Both legally and traditionally the defense budget is fairly clearly defined; around the edges there are the Atomic Energy Commission, some space activities, perhaps the Maritime Commission, that one may sometimes wish to lump into a comprehensive "defense total," and over which the Secretary of Defense does not exercise direct budgetary authority. But he has always had his 50 billion dollars or more that were unmistakably his responsibility; and money spent by the uniformed military services evidently came under his authority. The Secretary of Defense makes an annual comprehensive presentation of his budget, typically in the context of a broad evaluation of the military threat to the United States; it is a "State of the Union" insofar as national security is concerned. The committees in Congress that deal with the defense budget have no doubt that they are dealing with national defense and no doubt about what budget it is that they are considering.

Not so the Secretary of State, whose own budget of about a third of a billion dollars a year corresponds, to take a very crude analogy, to the budget that the Secretary of Defense might present for the operation of the Pentagon building and the people who work in it. The 5.6 billion dollars cited by the Director of the Budget is neither a "State Department Budget" nor a "Foreign Affairs Budget." It is a composite figure that makes a lot of sense to the Director of the Budget but has no official status and corresponds to no appropriations procedure. I have no doubt that his composite is a reasonable one; but if I were to present you my own figure I'm sure that it would be different, because there is no official definition that keeps me from adding, on the basis of judgment, a few things that his figure leaves out or deleting, on the basis of judgment, a few things that he and his staff think it expedient to include. Even he acknowledges that his figure leaves out intelligence as well as all expenditures on U.S. military forces; and while I may agree that it makes practical sense at the present time to put intelligence in a wholly separate category, it is not for "official" reasons. We know that the CIA is outside the defense budget because we know what the defense budget is; we do not know whether the CIA would be outside a "Foreign Affairs Budget," because we do not even know whether there ever will be a foreign affairs budget.

Let us imagine that Mr. Charles Hitch had been, instead of Assistant Secretary of Defense (Comptroller), Assistant Secretary of State (Foreign Affairs Comptroller). If he were to perform a task in the field of foreign affairs comparable to what he and Secretary Enthoven and others did for Secretary McNamara, he would have had to invent a budget, not merely to rationalize one. There would not have been a history of "Foreign Affairs Reorganization Acts" defining his budgetary jurisdiction. Nor could he have simply folded into one comprehensive foreign-affairs budget the budgets of several subordinate agencies; not all the agencies would have been subordinate, and some programs over which he might have wanted some coordinating authority would have been lodged in agencies, like the Department of Agriculture, whose primary responsibilities were not in the field of foreign affairs. By a heroic exercise of both intellect and authority, and with the full cooperation of the Budget Bureau, he might have achieved a welcome consolidation of budgetary plans on their way through the White House to Capitol Hill, but there the whole package would have had to be disintegrated to correspond to the Congressional appropriations structure. This would have been a different task, and in many ways a harder one, than the budgetary task that he actually took on—and that one itself was a task that an ordinary mortal would have shrunk from.

A DILEMMA OF STATE DEPARTMENT ORGANIZATION

I called my fifth generalization "final," but I'd like to make one organizational comment about the Department of State. It has been widely remarked, especially in the early years of the McNamara regime, that there were frictions between civilians and the military in the Pentagon, that "civilian control" was occasionally resented, that there was not always mutual trust and respect as between

civilians and the military, and that the civilians lacked direct experience in military command and the conduct of ground, air or naval operations. Just suppose the reverse had been true, and the Chief of Staff of the Army were *ex officio* Secretary of Defense, all his Assistant Secretaries chosen from the Army, all of their "whiz kids" being bright, promising young Army officers. I think the situation would have been impossible. The entire OSD, being strictly Army, would have had no experience in naval command or the conduct of modern strategic air operations; professional bias and service loyalty would have made it beyond the credulity of the Air Force and Navy that they were receiving fair, sympathetic and impartial treatment. Secretary McNamara had the disadvantage that he and his staff were a class apart—civilians—but he had the great advantage that he was unambiguously a civilian, not identified with a particular service, with no special bonds of personal sympathy or loyalty to any one service, and not obliged to devote part of his time to running one service while being the rest of his time the President's executive manager of them all.

The Secretary of State presides over, or can aspire to preside over, a number of civilian services and operations. But he is also traditionally identified with one particular service, the Foreign Service. The Department of Defense is essentially OSD, "the Office of the Secretary of Defense"; the Department of State is both OSS—"the Office of the Secretary of State"—and the Foreign Service. (It is also quite ambiguously related to ambassadors abroad, who are nominally the President's representatives, but who are more and more expected to be professional graduates of the Foreign Service.) The Congress has never quite recognized the OSS function of the Department of State; putting the Marshall Plan under an independent agency, the Economic Cooperation Administration, was a Congressional vote of "no confidence" in the executive talents of the State Department. Resentment and distrust of "State" by people in foreign aid programming, through a long sequence of agency reorganizations, has been not wholly dissimilar to the distrust that the military allegedly have for civilians in OSD.

Furthermore, by putting some of the specialized professional responsibilities in quasi-independent agencies like AID, USIA, Peace Corps, and so forth, the Executive Branch and the Congress have precluded the State Department's acquiring the professional talents, the internal organization, and the executive experience to lord it over these other agencies. No uniform distinguishes the AID official from a country director, or Deputy Assistant Secretary of State; but he may feel a little the way an Air Force officer would feel if the Congress had created the Defense Department by elevating one service into executive status while preserving the operating role of that service.

I have to discuss this because, as I mentioned earlier, techniques and procedures that are intended to enhance the budgetary role of a particular office tend, when successful, to enhance the executive authority of that office. The matter is not simply one of providing better analytical staff work to a senior official of the government; more than that, the issue is how to generate more coherent planning and better coordinated operation in the field of foreign affairs. The first thing to decide is whether we want more coherence, more coordination, and

an identified responsibility for executive direction. If we do not, then PPBS probably becomes an analytical specialty that is not really worth the attention of your committee. If we do, then I believe we have to recognize that the Department of State presently combines both what might be called the "Office of the Secretary of State," and the Foreign Service, and that this constitutes an encumbrance that the Department of Defense did not have to suffer.

THE COUNTRY AS THE PACKAGE

Now let me turn—"finally," if I may use that word again—to the first rudimentary step in the establishment of PPBS. It has nothing at all to do with computers, little to do with systems analysis, and in the first instance little to do with analysis of any kind. It harks back to the first elementary thing that Secretary Hitch did in the Department of Defense and that Secretary Enthoven may have emphasized too little, partly because of the progress he has made and partly because of the general interest in the mystique of systems analysis.

The most crucial thing that Secretary Hitch ever did was to identify his basic "program packages"—what are sometimes called the "outputs" of the defense budget. It is important, in thinking about a "foreign-affairs budget," not to pass on too readily to the examination of "program elements," and all the techniques of analysis that can thereafter be applied. Eventually most of PPBS is likely to be concerned with the evaluation of "program elements" and comparisons among them, with cost estimates and so forth. But this is already way beyond what first needs to be done in foreign affairs; that all comes after the basic program packages have been identified.

What is it that corresponds, in the field of foreign-affairs planning, to the original program packages that were developed under Charles Hitch? I believe the Director of the Bureau of the Budget gave you his answer when he said, "First,"—and I am glad he put it first—"individual countries constitute useful categories under which to analyze an agency's foreign affairs activities as a means of achieving U.S. objectives." Let me say it differently: Individual countries are the basic "program packages" for foreign affairs budgeting. (I do not at this point want to argue with people who think that regions rather than countries are the basic packages; I think they are wrong, but they are not the ones I want to argue with.) The basic package is not the program—Peace Corps, intelligence, AID, agricultural surpluses, technical assistance, Ex-Im bank credits—but the country. Secretary Hitch identified originally, I believe, about seven basic packages. I wish in foreign affairs we could get along with as few; as Charles Schultze indicated, the number of countries we now recognize in the world has grown to 119. I'm afraid this is an irreducible minimum number of packages, except as we can exercise selectivity in treating some as far more important than others.

Mr. Schultze understated it; individual countries are more than "useful categories," they are the *basic packages* for not only budgetary decisions but most other policy decisions. Countries cannot, of course, be treated in isolation—India separately from Pakistan, Jordan separately from Syria and Israel, Thailand separately from Vietnam and Cambodia. But neither can the Defense Department's strategic

defenses be considered wholly in isolation from strategic offenses, or "general purpose forces" from sea-lift and air-lift. The point is that the basic program package is not Peace Corps, financial aid, military aid, agricultural surpluses, propaganda, or diplomatic representation; the basic package is the country.

Maybe somebody can think of a better package. But what we are presently struggling for in our budgetary procedures is an identification of the objectives or "outputs" toward which our programs are supposed to be oriented. Just getting recognition that the country, rather than the agency or program, is the basic unit of analysis would be a heroic step. After that the people with specialized analytic talents, with schemes for the orderly collection of data, and with professional training in PPBS can go to work. The first step toward PPBS is officially identifying program packages; and that step has not yet been taken.

WHO COORDINATES FOREIGN POLICY?

To say that the basic program package in foreign affairs is the individual country can provoke either of two objections—that it is wrong, or that to say so is trivial. Those who object that it is wrong do not worry me; I share their discontent with the country as the basic package, but do not believe they can identify a better package, and in the end we shall, equally discontent, settle on the individual country as the least unsatisfactory basic package for foreign affairs budgeting.

Anyone who says that the individual country is so obviously the basic package that in saying so I have said nothing, is plain wrong. What I have said is trivial as far as analytical budgeting is concerned; but bureaucratically it is revolutionary. Charles Schultze is a sensible and responsible man; that does not mean he is not revolutionary, only that he makes his revolution slowly, carefully, and responsibly. The revolution is in considering all programs for a country together, rather than all countries for a program together. It is examining what the United States does with respect to Greece, Thailand, Brazil, India, or Nigeria, rather than what the United States does with aid, Peace Corps, agricultural surpluses, military assistance, and propaganda.

This is revolutionary not just because somebody would be looking at the totality of U.S. programs with respect to a particular country all together, relating them to the same set of objectives, comparing them with respect to their effectiveness, demanding that the same set of objectives be acknowledged in the consideration of each program, eliminating inconsistency and reducing duplication. Nor is it that, once the basic country packages are identified, countries would be compared with each other as claimants for U.S. resources and U.S. attention.

No, what would be revolutionary is that somebody or some agency has to do this, and it has to be decided who or which agency would do it. (It also has to be decided whether the Congress wants this done; and that may depend on who does it.)

Who should do it? An easy answer is that the Budget Bureau should do it; the Budget Bureau is the centralized agency that brings consistency and compatibility to the claims of diverse governmental programs, foreign and domestic. But what I said earlier about the

relation of budgeting to control commits me to the belief that we are talking about the question, "Who coordinates foreign policy?" I do not believe the answer should be the Bureau of the Budget.

Maybe the answer is "nobody." Maybe, as a practical matter, the answer is that the coordination will be fragmented, and the Budget Bureau will exercise a good part of the coordination. But if both the President and the Congress want this responsibility fixed unambiguously, in the absence of a drastic reorganization of the Executive Branch it would be hard to identify any formal locus of responsibility except the Office of the Secretary of State.

But to put this responsibility on the Secretary of State is to give him both a means and an obligation to assume the kind of executive authority that has never, in spite of executive orders and the logic of ideal government, either been wholly acceptable to the Department of State or freely offered to it. This is to put the purse strings directly into the hands of the Secretary of State with encouragement to use them in the executive management of foreign policy.

I think it makes sense, but I am not sure that this is what the Congress wants nor sure that this is what Secretaries of State and their senior staffs want. But this is where we are led by the philosophy of PPBS; and we are led there not by fancy analytical techniques but by the simple logic of "program packages" and the need to develop policies, as well as budgets, in a coherent process that recognizes the country as the primary unit of budgeting and policy-making.

I am not trying to lead your subcommittee, through any line of reasoning or casuistry, to a particular conclusion. If we were concerned exclusively with architecture, we would end up with a good case for demanding of the Secretary of State that his Office do this kind of budgeting and do it with the impartiality that would estrange the Foreign Service from the Office of the Secretary of State. But these issues cannot be settled by reference to the aesthetics of organization charts. These are pragmatic questions. Do we want coordination at the price of centralization? Can we split the Department of State into an executive foreign-affairs office and the Foreign Service? Does coordinated, centralized programming undermine the decentralized initiative and responsibility of programs like the Peace Corps, AID, or cultural exchanges? Does the Congress itself lose bargaining power when the Executive Branch gets better organized for foreign affairs, and is the Congress willing to encourage this?

I should like to see the Office of the Secretary of State accept the philosophy according to which it is the executive arm of the President for foreign affairs, and emancipated from the Foreign Service. I should like to see it use the budget process to clinch its authority and to rationalize its decision processes. I should like to see all overseas programs and activities brought under the purview of an "Office of the Secretary of State," streamlined to provide executive direction. And I should like to see the Department of State enjoy the benefits of modern analytical techniques of the kind that Secretary Enthoven has brought to the Department of Defense, as well as other kinds. But I cannot—I wish I could, but I cannot—declare with any confidence that this can be done. I come back to the remarks with which I began this memorandum. Foreign affairs is complicated and disorderly; its conduct depends mainly on the quality of the people who have responsibility; decisions have to be based on judgments,

often too suddenly to permit orderly analytical processes to determine those decisions. The best—the very best—performance that is humanly possible is likely to look pretty unsatisfactory to the Congress, to Washington correspondents, to the electorate, even to the President who presides over the arrangement. The system can be improved, but not to anybody's complete satisfaction. In this improvement, PPBS will eventually have a significant role.

DECEMBER 14, 1967.



PLANNING-PROGRAMMING-BUDGETING

USES AND ABUSES OF ANALYSIS

MEMORANDUM

PREPARED AT THE REQUEST OF THE
SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS

(Pursuant to S. Res. 212, 90th Cong.)

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INTRODUCTORY NOTE

The subcommittee is pleased to be able to publish this memorandum by Dr. James R. Schlesinger in the record of its inquiry on planning-programming-budgeting in the national security area.

We asked Dr. Schlesinger to prepare a statement indicating major points relating to the role of analysis in the national policy process which he believes we should consider as we proceed with our inquiry, and he has provided this valuable addition to our testimony.

Dr. Schlesinger is Director of Strategic Studies at the RAND Corporation. Teacher of economics and analyst of weaponry and defense management in the nuclear age, he serves as consultant to the Bureau of the Budget and other government agencies on certain aspects of national security programs.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

APRIL 22, 1968.

USES AND ABUSES OF ANALYSIS

By

James R. Schlesinger

The Subcommittee's invitation to assess the role that analysis may play in governmental decisionmaking is gratifying for a number of reasons. In its current stocktaking, the Subcommittee is accomplishing something of a turnabout: the analysis of systems analysis. This evaluation takes place at a critical time. Like other offspring in American life, analysis has been absorbed into an environment which has been at once both too permissive and too resentful. There is ample evidence that such a pattern is beneficial to neither the offspring nor the environment. Currently there is a risk that reaction against what may be termed the exuberance of certain claims and activities of analysis could result in the discarding of the substantial benefits that analysis does offer. I shall be attempting to bring out the instances of undue gullibility as well as undue skepticism, but in so doing I should perhaps make my own position clear. My attitude has long been one of two-and-a-half cheers for systems analysis. I recognize—and have emphasized—its limitations. I will make no excuses for offenses committed in its name. But despite the limitations and distortions, I remain an unabashed, if qualified, defender of the value of analysis in policy formation.

In the pages that follow I shall deal with some salient issues regarding the role of analysis: its relation to decisions and decisionmakers, its functioning in a political environment where conflicting objectives exist, and its utility for improving the resource allocation process.

THE AUTHORITY OF ANALYSIS

Systems analysis has been variously defined. In the most ambitious formulation it has been described as "the application of scientific method, using that term in its broadest sense." Certain attributes of science—objectivity, openness, self-correctability, verifiability, etc.—are alleged to apply to systems analysis. Would that it were so, but realistically speaking such assertions must be rejected. Even for science—as those who are familiar with the history of scientific investigations will recognize—this represents a rather romanticized view. In science, however, competition takes the form of establishing hypotheses regarding the workings of the natural order. Evidence and experiments are reproducible, and institutions and personalities consequently play a smaller long-run role. In scientific investigations the search for truth is by and large unfettered. By contrast, in the search for preferred policies such encumbrances as social values and goals, constraints, institutional requirements (both broad and narrow) pertain. Truth becomes only one of a number of conflicting objectives and, sad to relate, oftentimes a secondary one.

An alternative definition described systems analysis as "quantified common sense." By some expositors this definition has been treated as the equivalent of the earlier one, but is really quite distinct. However high the regard in which common sense, quantitative or otherwise, is held in the American community, it never has been regarded as synonymous with scientific method. Nonetheless, the definition is far more apt. Common sense, for example, will accept that within a complicated bureaucratic structure distortions inevitably creep into the process of acquiring and organizing evidence. What one sees depends upon where one sits—an earthy way of describing what is more elegantly referred to as cognitive limits. It may be inferred that a systems analysis shop attached to the Office of the Secretary of Defense will be quite responsive to the perceptions and prejudices of the Secretary and the institutional requirements of his Office. This should be no more surprising than that the Operations Analysis shop at Omaha will be influenced by the doctrine, present activities, and aspirations of the Strategic Air Command.

In the early years of the introduction of the PPB into the Department of Defense, faith in the ease with which scientific objectivity could be attained tended to be high in OSD. For Service staffs, this was a rather painful period for rather invidious distinctions were drawn regarding *their* objectivity. In recent years an enormous change has taken place regarding the nature of the analytical dialogue. Undoubtedly this new attitude reflects experience and the growing awareness that past decisions and past commitments limit the openness and the freshness with which the OSD staff can address issues in controversy.

This new realism has been reflected in a number of ways. Especially in private appraisals analysis has been justified with increasing frequency and frankness as part of an adversary proceeding. But such an interpretation is symptomatic of a substantial change. Whatever the merits of an adversary procedure—and these are substantial where there exist clashes of interests and goals and where evidence is difficult to unearth—no one has ever suggested that adversaries seek to be wholly objective. One may hope that the result will be the elucidation of the best possible case for and the best possible case against. But, unfortunately, the emphasis tends to shift to a search for the winning argument as opposed to the correct conclusion. In view of the uneven distribution of debating skills, one cannot fail to have qualms about the probable outcomes. One senior official has observed, only half facetiously, that experience in debate is the most valuable training for analytical work.

Acceptance of the tug-of-war concept, as opposed to the objective-scholar concept, of analysis has coincided with recognition of an even greater limitation on analysis as a guide to policymaking. In recent years it has been recognized in public statements (as well as the textbooks) that analysis is not a scientific procedure for reaching decisions which avoid intuitive elements, but rather a mechanism for sharpening the intuitions of the decisionmaker. Once again this is right. No matter how large a contribution that analysis makes, the role of the subjective preferences of the decisionmaker remains imposing. Analysis is, in the end, a method of investigating rather than solving problems. The highest strategic objectives, the statement of preferences or utility, must in large part be imposed from outside.

Poor or haphazard analysis may contribute to poor decisions, but good analysis by itself cannot insure correct decisions. This implies two things. First, whatever the complex of decisions, legitimate differences of opinion will persist. Second, disagreement with the decisions should not automatically cast doubt on either the role of analysis in general or on the quality of specific analyses. These must be examined in and of themselves.

To be sure, the judgment of the decisionmakers regarding major objectives and what is or is not important is likely to feed back and influence the analysis. This is not always true, but there are strong pressures to make it come true. Studies are driven by the underlying assumptions, and these may be imposed directly or indirectly from above. Specific terms of reference may indicate which scenarios are acceptable, which unacceptable, and which contingencies should or should not be considered. It is perfectly appropriate, if not obligatory, for the analyst to point out deficiencies in study assumptions or terms of reference. Yet, many will lack the perception or the inclination, while others would regard such action as personally imprudent. In these cases the analysis will only play back to the decisionmaker a more sharply defined version of what was already implicit in his assumptions. The role of analysis then becomes not so much to *sharpen* the intuitions of the decisionmaker as to *confirm* them.

Under these circumstances analysis is not being used in its most fruitful form, that of raising questions. But analysis is a tool that can be used in a variety of ways. Much depends upon how the decisionmaker decides to employ it. Considerable fear has been expressed that analysis will usurp the decisionmaking role, that the decisionmaker will become passive, and let analysis (implicitly) make the decisions. This is possible; it is also improper. But whether the decisionmaker will control the tool rather than letting it run away with him strikes me as a less important question than whether he will employ it properly in another sense. Will the decisionmaker tolerate analysis—even when it is his own hobby horses which are under scrutiny?

How many hobby horses are there?

Are they off limits to the analysts?

Dr. Enthoven has quite properly objected to the canard that analysis is somehow responsible for what are regarded as the mishaps of the TFX decisions, pointing out that the new procedures were only tangentially involved. A more penetrating question, it seems to me, is: why did the analysts steer away from the issue?

A slightly different issue arises in the case of Vietnam. Numerous blunders are alleged to be chargeable to analytic errors. But analysis has been employed in the Vietnamese context in only the most cursory fashion. In this context neither the high-level civilian nor the military authorities have been eager to exploit the full potentials of analysis. Once again, rather than blaming analytic efforts for the failures, the appropriate question should be: why has analysis been so little employed?

An acquaintance, who has been deeply involved in analytic activities in one of the Departments, recently commented to me on his experiences. Analysis he felt had been relevant in only a small proportion of the decisions. Half the time a decision had been foreclosed by high-level political involvement: a call from the White House, interest expressed by key Congressmen or Committees. In an additional 30

percent of the cases, the careers of immediate supervisors were involved. Analysis could not influence the recommendations; it could serve only as an irritant. But, he argued, in something like 20 percent of the issues, analysis was unfettered and contributed to much improved overall results. This was only the experience of one individual. In other cases the proportions might be quite different. The point is that analysis should be judged on the basis of only the minority of cases in which its influence is in some sense instrumental. Analysis is a useful tool, but it is only a tool. It would be a mistake to turn over a new proverbial leaf—and generally find fault with tools rather than craftsmen.

PRACTITIONERS VERSUS INSTRUMENTS

Accepting that analysis only sharpens the intuitions of decision-makers, that its powers may be curtailed by unquestioned (or question-begging) assumptions or by imposed terms of reference, and that it is increasingly viewed as a contest between adversaries permits us to be more realistic about analysis in a number of ways. The inflated claims, periodically made in its behalf, may be rejected—along with the misplaced criticisms made in response. Questioning of decisions is turned into questioning of decisionmakers' judgments rather than the role of analysis. And analysis itself can be employed more effectively in clarifying the underpinnings of policies, thereby creating the potential for designing more effective ones. We should understand that analysis provides no formula for solving problems, no prescription for sensible policies. It cannot and should not be employed to "demonstrate" that one's own policies are so right and those of others, so wrong.

What analysis provides is an exercise in logical coherence, hopefully with knowledge of and respect for the underlying technical, economic, and organizational data. Coherence does not insure the "correctness" of policy. In fact, an incoherent policy will sometimes be closer to correct than a coherent one. But the incoherence itself scarcely makes a contribution. It is almost invariably a source of waste, and typically of policy muddles.

Analysis may make a contribution, but we should be very clear what it cannot do. It does not provide an instant cure for pigheadedness. In fact, it does not provide an instant cure for anything—not because of its theoretical deficiencies, but because it has to be employed by people and by organizations with divergent goals and views and with stringently limited information about actual conditions.

It is a mistake to identify analysis with the particular judgments, prejudices or arguable decisions of some of its major proponents. Especially is this so when analysis has been employed as a weapon of political conflict. The political process being what it is, it is hardly advisable to admit error in public; that would prove too costly. Human emotions being what they are, it is also unlikely that error will be admitted in private. This does not gainsay the value of analysis before policy commitments are made—or when they are being seriously reconsidered. What it does say is that we should avoid tying analysis to the personal proclivities of the particular individuals who were instrumental in introducing it into government. To do so may be flattering to the individuals. Some may even be inclined to treat their own attitudes and commitments as synonymous with analysis. It would be a serious error for others to accept this view.

Disciplined, orderly thought is the characterization given to analysis, but disciplined, orderly thought suggests certain traits: reflectiveness, self-criticism, and the willingness to reconsider past commitments without self-justification. However rarely or frequently encountered in the general human population, these are not traits characteristic of the action-oriented, incisive individuals who reach policymaking positions. Questioning and self-doubt lead to Hamlet-like decisionmakers.

Analysts themselves may be self-doubting, bemused by uncertainties, frighteningly candid, but different tactics have been required of the missionaries who have proselytized in behalf of analysis. I do not need to develop this point at any length. It should be plain, for example, that the actual decision to introduce analysis on a government-wide basis (as previously within the DOD) required an act of judgment and courage passing beyond the confines of analysis. Some analysts found the manner in which analytical procedures were instituted disquieting. This no doubt reflects a certain naivete on their part regarding political processes. But analysis was introduced rather suddenly. There was little advance preparation, little attempt to assess resource availability or calculate short-run costs. There was no "program definition phase." What occurred was that the political conditions were ripe,* and the opportunity was seized—for analysis.

I have perhaps belabored the distinction between analysis and judgment and the fact that the act of deciding occurs in the non-analytical phase. These matters need to be emphasized right now. It is important that analytical procedures in the DOD or elsewhere *not* be identified with particular sets of policies, decisions, or individuals. If analysis comes to be confused with the idiosyncracies of a few dominant personalities, there is some risk that it will disappear along with its original proponents. Its potential benefits for U.S. policy would then be lost for some time to come.

Admittedly there have been overstated claims, planted stories, and an impression generated among the *cognoscenti* of a new, scientific means for grinding out decisions. Admittedly the limitations appeared in the footnotes and not in the fanfare. But these are just the accoutrements of attention-getting. Analysis itself should scarcely be discarded on these grounds. Even if some decisionmakers or analysts have failed to display the mental elasticity that analysis in principle demands, this is only a reflection of the human condition. Why throw the baby out with the bathwater?

PAYOFFS

What is the baby? I seem to have devoted most of my attention to the reasons for refraining from that last half cheer for analysis, and virtually no attention to the reasons for the two and one-half cheers. In part this is due to the excellent set of papers and comments that the Subcommittee has published. Therein the potential benefits of program budgeting and analysis are fully presented. Lengthy reiterations of either the potential advantages or the accomplishments seem unnecessary. However, there are some points on which I should like to add a few words.

*This episode suggests why the politician in his role may find analysis both incomplete and frustrating. Analysis deals in a rather abstract way with resource usage and efficient allocations. It does not deal with the attitudinal issues of support-generation, coalition-gathering or with timing which are so important in the political context.

First, analysis has great value in turning debates over resource allocation toward the realities and away from simple statements of noble purpose. Analysis is not scientific method. Neither will it necessarily be objective in an organizational context. Yet, within the adversary relationship, analysis at least focuses the debate on what particular systems can accomplish and what numbers are required. The emphasis is on the real rather than the symbolic function of weapon systems. Disappointed as many in the Services have been with major policy decisions of the OSD, I believe most knowledgeable officers would agree that the new methods have been beneficial in this respect.

Second and closely related, analysis is oriented toward outputs rather than toward inputs. In this way expenditures can be tied to specific goals, and those expenditures which satisfy primarily the traditions or well-being of individual agencies are brought into question. There are difficulties with goal or output orientation, particularly since we so frequently lack complete understanding of the mechanism that ties inputs to outputs. But the orientation is correct. The government structure is subdivided into agencies that typically concentrate on inputs. Dams, warships, trees, post offices, bombers, nuclear power, supersonic transportation, and, I may add, research expenditures are often treated as ends in themselves—with little examination as to how these instruments serve public purposes. Conscious output orientation, with as much quantitative backup as possible, points in the right direction. It forces agencies to shift attention from their beloved instruments and to explain the goals they serve rather than the functions they perform—and this at a level more practical than the usual rhetoric of noble purpose.

Third, the attempt is made to design systems or policies with practical budgetary limits in mind. The time-honored gap between the planners and the budgeteers has been widely discussed, along with the difficulties it causes. There is little point in plans too costly to be implemented or systems too expensive to be bought in the requisite quantity—if some reduction in quality will provide a feasible and serviceable, if less ideal, posture. (Here we are discussing capabilities and postures which would be effective, if bought—keeping in mind that so many expensive proposals serve little purpose at all.)

Fourth, an attempt is made to take spillovers into account and to achieve better integration between the several Services and Commands. Once again, this is more easily said than done. For example, we are belatedly becoming aware of the spillovers and the integration problems between the strategic offensive force under Air Force management and the new Sentinel system under Army control. This indicates that the attempt to take spillovers into account has not been overwhelmingly successful, but the goal is a correct one. The nation would not wish to duplicate SAC's capabilities for SACEUR or the Polaris force for CINCSAC.

Fifth, the attempt is made to take into account the long-run cost implications of decisions. Perhaps, it is more appropriate to say . . . the attempt *should* be made. There has been a certain inconsistency on this account. The costs of some systems have been carefully investigated, before a choice is made. For other (preferred) systems this has not been the case. The Program Definition Phase was originally introduced to insure that technology was in hand and the long-run

costs considered before force structure decisions were made. Yet, curiously, in the programmed forces for the '70s our strategic forces are scheduled to become increasingly dependent on MIRVed vehicles, even though the technology is not yet in hand and we have only an inkling of the ultimate costs. The appropriate review of alternatives and hedges did not take place. But this represents, not a criticism of the objective, but a plea for more consistency in its pursuit. It hardly negates the desirability of the careful weighing of alternatives with the long-run cost implications taken into account.

These attributes and precepts of analysis seem unexceptionable. They are.

An appropriate inference is that many of the complaints couched in terms of "too much analysis" or "the errors of analysis" should be altered into "better and more consistent analysis." In this connection, an editor and friend recently suggested a paper on the impact of systems analysis: "not the general appraisals, we've had enough of that; tell us whether systems analysis has ever really been employed in the Department of Defense." An exaggeration perhaps, but as the MIRVing case suggests, analytic techniques have not been consistently applied.

Bernard Shaw observed somewhere that the only trouble with Christianity was that it had never really been tried. An epigram is at best a half truth, designed as someone has commented to irritate anyone who believes the other half. In DOD systems analysis has at least been tried. But there is an element in Shaw's remark that needs to be taken into account. In assessing the success of analysis, both the incomplete implementation and the resistance should be kept in mind.

BUDGETS

Military posture is determined in large measure by the total volume of resources the society is willing to divert from non-defense to defense uses. Yet, understanding the determinants of this resource flow presents a most perplexing problem. No good mechanism or rationale exists for deciding what diversion is proper. Some analysts have shied away from the problem arguing that the main objective should be the efficient employment of whatever resources are provided. A limited feel for appropriate diversion may be obtained by asking such questions as how much more is needed for defense than is needed for other purposes. In principle, senior policymakers may find it no harder to decide on allocation between damage limiting and urban renewal than between damage limiting and assured destruction. They will certainly find it no easier. For a number of practical reasons, they may find it far harder actually to bring about such a resource shift.

The amorphousness of this decision area combined with the repudiation of what were regarded as the rigidities of the Eisenhower years led to some bold words in 1961: there would be no *arbitrary* budget limits; in addition, every proposal would be examined on its own merits. These guidelines have since been regularly reasserted—with perhaps somewhat falling conviction. Originally they might be attributed to sheer enthusiasm; now they can only be taken as either propaganda or self-deception.

However, no matter the source, they will not stand up to *analysis*.

At any time there exists a rough political limit on defense expenditures. For members of this Subcommittee—in fact for any practicing politician—such an assertion will seem like a truism. Something like a consensus develops regarding proper levels of defense expenditures—and in the absence of external shocks this sum will not be substantially augmented. Of course, the *arbitrary* limit is always the *other fellow's*. One's own limit is only proximate and is wholly reasonable. Yet, defense expenditures do tend to become stabilized for years within rather narrow limits. Inevitably, new pressure for funds leads to the sacrifice of programs previously desirable on their own merits. That is as simple as arithmetic.

The only time that budget limits are not pressing (and more or less arbitrary) is when, as during the early Kennedy years, a political decision has been made that much more can be spent on defense. After a brief period of exuberance, the old constraints reappear. The decision does not have to be announced by the President or the Budget Bureau. The Secretary of Defense may get a feel for what is feasible, or he may be trusted to bring in a reasonable figure. But within a rather narrow range he will face a limit, which he may not transcend without either creating a minor fiscal crisis or straining his own credit with the President of the United States.

Save in the rare periods of budgetary relaxation, this, rightly or wrongly, is the way the system works. There is no point in kidding oneself. One may erect a facade intended to demonstrate that there are no arbitrary budget limits and each proposal is examined on its own merits. The pretense can be partially successful, but only because the criteria for choice are so imprecise. Standards can be made increasingly stringent, yet no one can prove how large was the role of budgetary pressures.

Nonetheless, no one should be deceived. What happens is that various alternatives and hedges are discarded; programs become less pressing and are stretched out. The practices are well-known from the bad, old meat-axe days. Under budgetary pressure (arbitrary or not) it is truly remarkable how many options one discovers one can do without. Multiple options just become less multiple. Before uncertainties are resolved, commitments are made and hedge programs are terminated. In the well-advertised adversary relationship, the negotiator-analysts become much harder to persuade. If they are not directly instructed, *they know*.

These are not hypothetical possibilities. With the intensification of budgetary pressures stemming from the Vietnamese war, there has, for example, been a wholesale slaughter of programs in the strategic area. It is important not to be misled regarding the critical role of budgetary pressures—and thus come to believe that so many programs, previously regarded as meritworthy, have suddenly lost their merit. Otherwise, we might gradually come to believe that we are doing far better than is actually the case. One should remain aware that the decimation of a program has long-run postural implications. That is, after all, the message that PPB attempts to convey.

These are elementary propositions. I do not dwell on certain theoretical problems and inconsistencies bearing on the relationship of overall defense spending to the optimality of programs. Suffice it to say that the *quality* of what one buys depends upon how much one wants to spend. This connection between level of demand and cost/

effectiveness creates a dilemma in that *neither* the character of the programs nor the size of the budget can be determined initially. But that is a theoretical nicety, the direct consequences of which may not be of major importance.

The vital point is the way in which budgetary limits may control force posture and therefore strategy. Shifting sands seems the best way to characterize the strategic rationales of recent years. In 1961 the suicidal implications of massive retaliation were underscored: the United States would be faced with a choice between humiliation or holocaust. Interest then developed in damage-limiting and coercion. But there has been little willingness to invest money in either. Since 1965 the merits of Assured Destruction have been emphasized—with little attention paid to the suicidal implications found so distressing in prior years. The principal rationale for the current emphasis on Assured Destruction reflects certain recently-developed notions of arms control. It clearly falls within the province of the decisionmakers to adopt a strategy of measured response to any Soviet buildup with the long-term objective of preserving U.S. Assured Destruction capabilities. One should note, however, that to accept this particular guide to action implies that the buildup of the Minuteman force in 1961–62 was a mistake. These newer arms control criteria may be the preferred ones, but they rest on the judgments and intuitions of the decisionmakers. They certainly do not emerge by themselves from analysis.

May one infer that the oscillations in strategy have something to do with budget limits, or in this case something more specific: a preconception regarding how much this nation should spend on the strategic forces? I find the conclusion irresistible. The evidence antedates the current phase-down in the face of the Soviet buildup. Once again, these lie within the decisionmaker's prerogatives, but particular beliefs regarding budget limits or the "adequacy" of specific strategies should not be attributed to, much less blamed on, analysis.

A USEFUL IF OVERSOLD TOOL

Whatever resources are made available to defense (or any other mission), choices will have to be made.

Allocative decisions inevitably are painful; many claimants will be sorely disappointed.

Few will find fault with their own proposals, almost all with the machinery for selection.

Any procedures for allocation will be criticized—even in a hypothetical case in which the conceptual basis is unarguable and no errors are made. Analysis provides the backup for a selective process. What does it contribute? How does it compare with real-world alternatives—not with mythical alternatives in which all claimants get their requests and no one is disappointed?

It has been emphasized that analysis cannot determine the appropriate strategy. It can shed light on costs and tradeoffs. But the choice to press arms control or arms competition or to rely on tactical nuclears or nuclear firebreaks must be determined by the decisionmaker sustained primarily by hope, conviction, and prayer. Even if a decision could be demonstrated as correct at a given moment in time, there is the certainty that objectives will change over time. For these higher level problems analysis is an aid, but a limited aid. The toughest

problems, dominated as they are by uncertainties and by differences in goals, do not yield to analysis.

Happily many problems are more mundane and more tractable. Where analysis has proved its highest value is in uncovering cases of gross waste: points at which substantial expenditures may contribute little to any stated objective. It might be thought that a problem of diminishing returns exists for analysis in that the cases of gross misuse of resources are likely to be uncovered at an early stage. Thus, as the opportunity for major savings through elimination of irrational forms of waste theoretically recedes, analysis would be forced into the more ambiguous areas in which strategic choices become intimately involved. In some cases, where information is readily available and objectives and conditions relatively unchanging, this could prove to be true. The very success of analysis would then undermine near-term expectations of additional returns. However, in defense this turns out to be irrelevant, since the problems are so volatile and information so difficult to unearth.

To say that analysis works best in cases of gross waste should not be taken to imply that analysis accomplishes little. The simple cases involving so-called dominant solutions may involve billions of dollars. The volume of government resources that may be lavished on the care and feeding of white elephants is simply staggering.

Here we have "quantified common sense" in its most direct form. In bureaucracies, units at all levels are concerned with organizational health. Rather than making the hard choices, the tendency is strong to maintain morale by paying off all parties. Analysis provides a means for coping with this problem. The big issues may not be directly involved, though they are likely to be dragged in by the proponents of particular programs.

Should the assessment of analysis be much influenced by the annoyance felt by those whose proposals have failed the tests? Certainly not in the general case. No more than should the decisionmakers be permitted to hide their judgments behind the camouflage of analysis, should the patrons of doubtful proposals be encouraged to argue that acceptance would and should have come—if *only* analysis had not been employed. Budgets are limited and hard choices must be made. If nobody were annoyed analysis would not be doing its job—of questioning both routinized practices and blue-sky propositions. Disappointment is unavoidable. The question is not the existence of annoyance, but to strive to annoy in the right way and for the right reasons.

In this light it may be desirable to examine the issue of the generalist versus the specialist which has been touched upon in the Hearings. In the nature of things specialists become committed to particulars: a piece of hardware, a technological criterion, a disciplinary blind spot. It is a case of suboptimization run wild. Proponents of specific capabilities or gadgets tend to become monomaniacs. In a sense that is the way they should be: totally dedicated to their tasks. But one does not turn to them for detached judgments. There is no substitute for the *informed* generalist. There is a recognizable risk that the superficiality of the generalist may match the monomania of the specialist. However, that need not be the case. Although the generalist's knowledge cannot match that of the specialist in detail, analysis can

once again play a useful role, by permitting the organization for the generalist of more specialized information than he alone could master.

How does this relate to the limits of the analyst's role? Two distinctions should be kept in mind: that between the technical specialist and the analytical generalist and that between the analyst and the decisionmaker. The analyst's tools are not circumscribed by discipline or even by subject matter. But general tools are not immediately convertible into broad policies. Many analysts are, in some sense, specialists in the use of general tools. Being a good analytical generalist does not necessarily imply possession of such additional qualities as breadth, judgment, and political attunement. These latter qualities are what many have in mind when they speak of the generalist as policymaker.

CONCLUSION

In closing I should like to underscore three points.

First, the position of the decisionmaker employing analysis is somewhat ambiguous. For tactical purposes this ambiguity may be deliberately augmented. Intermittently he may choose to stress *analysis* or *judgment*, and to shift hats according to the tactical requirements of the moment. His policy judgments may be obscured or defended by cryptic references to detailed analyses which allegedly force the policy conclusions. On the other hand, if any limitations or inadequacies in the analyses should come to light, these can be waved away with the reminder that all issues are ultimately matters for the decisionmaker's judgment.

Moreover, the pattern is in reality far more complicated than the standard exposition in which the analyst produces an *objective* study, and the decisionmaker's judgment enters at a later stage erected on the foundation of these objective results. That makes the analytical and judgmental stages seem clean-cut. Few studies are that pure. The decisionmaker's judgments quite typically are dumped in at an early stage in the form of guidance, assumptions, and terms of reference. The more political a study, the less likely is it to be pure. In fact, the process can be (and has been) far more corrupted, when questionable (phony) numbers are introduced. Since judgment and analysis are thoroughly intertwined in all but a few studies, the attempt of decisionmakers to shift roles by referring to fundamental analyses should be treated with some skepticism. The decisionmaker should not be permitted to escape the full burden of responsibility by the invocation of analysis.

The temptation for those who have introduced analytical techniques into the government to treat their own positions or careers as identical with analysis is understandable. No outsider should yield to the same temptation. The roles and even the temperaments of decisionmaker and analyst are quite distinct. The confusion tends to disguise the heavy personal burden borne by the decisionmaker. More important, if analysis is treated as synonymous with particular decisions or personalities, there is a risk that it will be throttled or abandoned after their departure. From the standpoint of public policy this would be a major loss.

Second, we should avoid the erroneous belief that the performance or potential power of analysis will be uniform in all contexts. If a town is considering building a bridge, a number of difficult analytical

problems must be addressed: does demand warrant construction, where should the bridge be built, what should be its capacity, and so on. But once these questions are resolved the engineer falls back on a solid technical base. By contrast, for such goals as deterrence, assured destruction, controlled nuclear warfare, damage limiting, to say nothing of welfare benefits, we fall back, not on a firm technical base, but on what may be scientific mush. The distinction is not always appreciated. The difficulty is sometimes dealt with by referring euphemistically to the *model problem*. But our ability to formulate models depends upon our knowledge of the mechanics of the real world. For many problems our knowledge is meager, and the proffered models are misleading or downright erroneous. The lack of good models in many problem areas simultaneously limits the power of analysis, while increasing the burden placed on judgment. In treating analysis as a uniformly efficient problem-solving technique, the variability of analysis, which reflects the variability of the knowledge base, is ignored.

Though analysis is a powerful tool, specific analyses vary greatly in quality. Some are little more than trash. But we need to discriminate, rather than to reject analysis *in toto*. At the present time there is some risk that we will do the latter. In an address some years ago Secretary Enthoven observed: "My general impression is that the art of systems analysis is in about the same stage now as medicine during the latter half of the 19th century; that is, it has just reached the point at which it can do more good than harm." That was a frank and realistic, if somewhat pessimistic, assessment of the state of the *art*. Scientifically speaking, there are numerous blind spots in medicine. Yet, most of us ultimately are inclined to accept the doctor's diagnosis, if not his advice. Quite plainly at the present time Congress and the public are having second thoughts regarding how much trust to put in systems analysis. No doubt it is necessary to develop a greater ability to discriminate. Nonetheless, I suggest that policy will benefit substantially from the analysts' diagnoses.

Third, there is little doubt that analysis has been oversold. That strikes me as a rather standard result in matters political. But the reaction against the overselling could be more costly than the overselling itself. Analysis is a powerful instrument: with it our batting average has been far higher than without it. Analysis is also an adaptable instrument. The McNamara regime has in many respects been a highly personalized one. Its performance should not be taken as defining the limits of this flexible tool. Admittedly, analyses vary substantially in quality. Each should be taken with a large grain of salt. On the other hand, if one does not demand too much of it, analysis will prove to be a most serviceable instrument.



PLANNING-PROGRAMMING-BUDGETING

PROGRAM BUDGETING IN FOREIGN AFFAIRS:
SOME REFLECTIONS

MEMORANDUM

PREPARED AT THE REQUEST OF THE
SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS

(Pursuant to S. Res. 212, 90th Cong.)

OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE



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INTRODUCTORY NOTE

The subcommittee is fortunate in being able to include, in the record of its study, this memorandum by Dr. Frederick C. Mosher on planning-programming-budgeting in the national security area.

We invited Dr. Mosher to prepare a statement covering the main problems and implications of program budgeting in foreign affairs organizations, and he responded with this discerning contribution to our testimony.

Dr. Mosher is Professor of Government and Foreign Affairs and member of the Center for Advanced Studies at the University of Virginia. A long-time supporter of program budgeting, Dr. Mosher authored a pioneering book on the subject in 1954. Entitled *Program Budgeting: Theory and Practice*, it focused mainly on the Department of the Army. Dr. Mosher was Staff Director of the (Herter) Committee on Foreign Affairs Personnel and a principal contributor to its report *Personnel for the New Diplomacy* (December 1962), which helped stimulate the program-budgeting effort in the Department of State. As consultant to the Department of State in 1966 and 1967, he worked on behalf of program budgeting, interviewed several hundred foreign affairs officials in Washington and abroad, and, in January 1967, submitted a report to the Department entitled, *Planning, Programming, and Budgeting for Foreign Affairs*. In 1966, he served as a member of the Secretary's Advisory Group on Foreign Affairs Planning, Programming, and Budgeting—better known as the Hitch Committee.

Some of the material in this memorandum is derived from an investigation conducted by Dr. Mosher under the sponsorship of the Inter-University Case Program, and he will be co-author, with John E. Harr, of a book soon to be published, by the Inter-University Case Program, on program budgeting and foreign affairs.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

NOVEMBER 27, 1968.

PROGRAM BUDGETING IN FOREIGN AFFAIRS: SOME REFLECTIONS

By

Frederick C. Mosher

FOREWORD

The burgeoning literature about the Planning-Programming-Budgeting System (PPBS) in recent years has included only occasional, almost parenthetical, references to its potential impact upon organizations and the obstacles which organizations present to it. Many of the articles and monographs assure us that PPBS will contribute to better, more rational decisions. But beyond this, the interrelations between it and the bureaucracies in which it would operate are usually ignored or treated very casually. There have been almost no objective, empirical studies of real-life experiences with PPBS, even in the Department of Defense. Strangely, neither the missionaries nor the critics of PPBS have, to my knowledge, sponsored, or even recommended, a cost-benefit analysis of PPBS itself.

The paragraphs which follow undertake no cost-benefit analysis; rather they attempt to distill, from recent experiences in the area of foreign affairs, some observations and hopefully some wisdom about the problems and implications of program budgeting¹ in going organizations. They proceed from four propositions:

1. that program budgeting, to the extent it is effective, will bring about shifts of influence within organizations upon the making and the effecting of decisions—in other words, *real* changes in organization, whether or not there are changes in the official chart;
2. that program budgeting—its nature, its potential, its limitations, and its costs—will vary from one organization to another, depending upon the nature of activities involved and the environmental context within which they are carried on;
3. that the nature and the acceptance of program budgeting depends heavily upon the “culture” of the organization;
4. that the installation of program budgeting is a difficult maneuver, strewn with land-mines of bureaucratic inertia, conflict, professional pride, and stress; it requires a good deal of familiarity with the local scene, sensitivity, and skill.

¹ The term “program budgeting” is here used in a somewhat more generic sense than “PPBS” for reasons that will be apparent in later paragraphs of this essay. The RAND-Defense authors of PPBS do not agree whether the terms are synonymous. In foreign affairs, they came to have quite different connotations in organizational terms, as distinct from conceptual or methodological terms.

In these respects, program budgeting is not unlike other kinds of institutional innovation. It is probably more complex and difficult than its relatives—operations research, systems analysis, etc.—and it is surely more difficult to apply in governmental agencies than in private business because of the inherently controversial and political character of public enterprise and particularly because of the legislative and executive processes in budget-making.

Over the course of the last three or four decades, the social sciences have contributed a great deal of insight about all four of the propositions above: organizational power; the environmental context of organizations; the internal culture of organizations; and the problems of institutional change. Indeed whole fields of academic study have been spawned to focus on aspects of them: organizational development, role theory, social systems analysis, administrative behavior, conflict and conflict resolution, creativity, policy-making, and others. Unfortunately, most of the literature about program budgeting—and I fear most of its practice—reflects little acquaintance with or even awareness of these fields of study or the subjects with which they deal. There has been minimal concern about the reciprocal impacts of program budgeting and organizations and about the reciprocal impacts of program budgeting and people.

THE DEFENSE DEPARTMENT MODEL

PPBS, as it was developed in the Department of Defense in 1961 and later, was in many respects a logical extension of the budget reform movement that has been sporadically developing since about 1910. Budgetary reform has consistently aimed to enlarge the power of executives over the operations of agencies for which they have nominal responsibility. In fact, during the last half-century the budget was unquestionably the principal instrument whereby titular executives could become actual executives: whereby weak governors and mayors could become strong; whereby the President could become a true Chief Executive; whereby department heads could gain some foothold of control over their subordinate bureaus. It now seems clear that PPBS had the effect of consolidating the power of the Secretary of Defense over the constituent military services, just as fifteen years earlier, performance budgeting strengthened the hands of the service secretaries and the military staffs over the bureaus and arms and services. In other words, PPBS and other waves of reform have had the effect of centralizing power at higher levels of organization; and this has usually been their intent, whether or not this was so articulated.

Nor was the idea of linking plans with programs with budgets a novel one in 1961. The Taft Commission on Economy and Efficiency fifty-five years ago expressed the idea at least in rudimentary form. It was a central feature of the efforts to improve Federal management in the latter years of the New Deal and was explicit in the performance budget proposal of the first Hoover Commission. All three of the military services had been working toward such a linkage since World War II, though with less than spectacular success.

Among the more distinctive features of PPBS—themselves not necessarily new—were the application of cost-benefit studies to budgetary

decision, the analysis of alternative programs, and the consideration of tradeoffs. Quite apart from the technical virtues and applicability of these features, they relied upon esoteric knowledge and techniques not immediately familiar to military officers or "traditional" budgeteers. Thus PPBS in Defense had the effect of shifting influence and power not alone upward from the military services to the Secretary of Defense but also to different kinds of specialists, i.e., particular kinds of economic analysts.

When President Johnson in August 1965 directed the installation of PPBS in the civil agencies of the government, he cited the Defense Department as a model. Although the two types of power shift described above might be expected in other agencies, the model was less appropriate in other respects. In a good many ways, the Defense Department was and is unique.

- (1) *Power*: Over the years since its establishment in 1947, the legal authority of the Secretary of Defense had been sporadically enlarged through statutes and reorganizations. At the time Secretary McNamara took office, it was legally firm and unquestioned. PPBS could be, and was, a tool whereby that authority could be made effective. Such a situation existed in almost no other field of Federal endeavor (except perhaps the Post Office and NASA). Authority was typically fragmented and partial in foreign affairs and domestic fields like education, transportation, poverty, natural resources, etc.
- (2) *Environmental Constraints*: Defense appropriations were enormous, especially in those areas where PPBS was concentrated such as research and development, weapons systems, and major equipment. They were relatively "open" with wide areas of administrative discretion. In most other areas, Federal agencies must operate through quite specific and limited grants of legal authority and within narrowly circumscribed appropriations. Further, in many of these programs, there is continuous pressure group involvement and political feedback.
- (3) *Organizational Culture*: Defense had at least two major advantages over most of the civil agencies of the government in this regard. First, through many centuries of development, military personnel were and are indoctrinated with respect for authority and hierarchy. Directives from legitimate offices are normally respected. Second, a basic element of military indoctrination has for centuries been forward planning and the development of military programs pursuant to plans. Although in the relating of plans to resources—i.e., budgets—our military agencies had not been conspicuously successful, they were attuned to and understanding of the needs and processes of planning—perhaps more than any other agencies of the government.

In addition to the advantages cited above, the Defense Department had a further asset: the capability gained through about a decade of study and experience (mainly at the RAND Corporation) prior to the formal beginning of PPBS. Most Federal agencies had no such background nor the technicians which this experience could produce.

Clearly, in most areas of Federal activity, the Defense model of PPBS could be helpful only in peripheral ways. Most would have to develop their own blueprints, adapted to their own subject matter, their own power structure, their own environment, and their own culture.

THE CASE OF FOREIGN AFFAIRS: CCPS AND PPBS

The problems of programming and budgeting in foreign affairs are, like those in Defense, different and unique. But in a number of respects, they resemble the situations in other civil fields of governmental operations more than they resemble the problems in Defense. There are a large number and variety of agencies concerned and a tremendously complex set of relationships among them. Few of them spend very much money on overseas programs, but those that do, such as AID, Defense, and Agriculture bring the total up to between five and six billion dollars a year (not including military operations overseas and Vietnam). The lead agency in foreign affairs, the Department of State, is the oldest and most prestigious of all Federal agencies. But its role and authority with respect to foreign affairs programs remain ambiguous. It is generally considered, and considers itself, as the principal formulator and Presidential adviser on foreign policy; but it has not often assumed the leadership in coordinating foreign operations and programs. Its own budget is almost trivial in financial terms—about one-fifteenth of total expenditures in the foreign realm; and most of the other agencies have their own appropriations, provided by their own appropriation subcommittees in Congress.

The need for more effective programming and coordination of American undertakings overseas has long been recognized in Washington—long before PPBS burst on the scene. It was discussed in the late forties in connection with the development of the ECA program. Presidents Truman, Eisenhower, and Kennedy all issued instructions to widen the authority of ambassadors with regard to programs of agencies other than that of the State Department. The directive of President Kennedy, in May 1961, was the most sweeping. He wrote every ambassador that: "In regard to your personal authority and responsibility, I shall count on you to oversee and coordinate all the activities of the United States Government in _____". But the situation in Washington was far more equivocal. During the fifties, there was a major effort, particularly under Secretary Dulles, to segregate policy from operations, concentrating the former in the Department of State, the latter in other agencies. President Eisenhower established the Operations Coordinating Board, chaired by the Under Secretary of State, to see to and coordinate the execution of decisions of the National Security Council. Soon after his inauguration, President Kennedy moved in the opposite direction, abolishing the Board and declaring that ". . . we will center responsibility for

much of the Board's work in the Secretary of State". But the President's directive provided rather little guidance or machinery for making it effective.

In all of this activity, there was little concerted attention to the problems of coordinating forward programs in the international arena or relating them to the annual budget. The programs for economic assistance, under their various titles, had in fact developed systems for program planning for the underdeveloped countries, and with the Kennedy Administration these were further developed to be among the most elaborate in the government. Some of the other agencies likewise developed rudimentary planning-programming systems, but these were related to one another in a haphazard way if at all. The State Department itself had virtually no system of its own—other than the development of *ad hoc* foreign policies—and took little part in developing or coordinating those of other agencies.

In the late nineteen-fifties and the early sixties, there had been sporadic discussion about developing a programming-budgeting system comprehending all foreign affairs and under State Department leadership in a variety of places: the Bureau of the Budget, the Department of State, even the White House. But the first clear public advocacy came in December 1962 from a rather unlikely source: a committee of private citizens, set up at the suggestion of Secretary Rusk to study personnel problems in foreign affairs and supported by three foundations. This Committee on Foreign Affairs Personnel, better known for its Chairman as the Herter Committee, directed the first part of its report, *Personnel for the New Diplomacy*, not to personnel but to the *role* and the *organization* of the Department of State. Its first recommendation urged the strengthening of the Department "to assist the President in providing leadership and coordination in foreign affairs" and defined its responsibility to include "the formulation of foreign policy, the development and coordination of foreign affairs programs, and the planning and marshaling of the resources needed for their implementation." Its second recommendation proposed a new post of Executive Under Secretary, third ranking in the Department, to oversee all foreign affairs activities, to assure that "policies are supported by action programs and by the means and resources for their realization" and that "the processes of *policymaking, program development, budgeting, and administration are brought into an effective union.*" (Emphases added.) Third, the Committee recommended establishment of a system "whereby foreign policy objectives are translated into programs of action to be undertaken in each area of foreign affairs activity, projected as far into the future as is feasible, and used as a basis for estimating future personnel and other needs in foreign affairs."

In 1963 was begun a major campaign within the State Department to develop a programming system comprehending all significant American undertakings overseas, other than military operations. In its objectives—though never in actuality—it would be a PPBS. The Department's Policy Planning Council would provide the policy base for the system in its National Policy Papers (NPP's), each of which comprised a comprehensive statement of American objectives in one country. Specific programs and resource requirements would be developed in individual countries overseas under the direction of the

ambassadors and according to standard interagency classifications. Unlike PPBS in Defense, it would start on a decentralized basis in the field rather than in Washington headquarters. The new system was first called *Comprehensive Country Programming System* (CCPS) since the base unit would be the foreign country. In 1966, substantially revised, the system's name was changed to *Foreign Affairs Programming System* (FAPS).

During 1963, 1964, and the first part of 1965, CCPS was developed energetically and installed on an experimental basis, first in a few countries in Latin America and later in many countries around the world, ranging from Iceland and Ethiopia to India, Germany, and the United Kingdom. At its zenith, it had been tried in more than thirty foreign countries, and about fifty officials, overseas and at home, were specialized in developing and applying it. At that stage, it was more an "information" than a "programming" system, and unlike PPBS, laid little emphasis upon analysis. Its proponents reasoned that there was too little existing data to provide a base for analysis, which should come later.

It is unnecessary here to recount the tortuous and dramatic rise and fall of CCPS.² Perhaps the most crucial event was the issuance in August 1965 of the Presidential directive requiring almost every federal agency to set up a PPB system. This and the Budget Bureau's Bulletin 66-3 of October 1965 directed an *agency* rather than a *country* base for programming and made no special provision for a comprehensive interagency system. Later, in March 1966, the idea of comprehensive programming under State Department leadership was given new life by another Presidential directive, National Security Action Memorandum (NSAM) 341, which gave the Secretary of State responsibility for directing and coordinating virtually all foreign affairs activities and set up machinery for this purpose: the Senior Interdepartmental Group (SIG) and the Interdepartmental Regional Groups (IRG's) for each region of the world. The subsequent history consisted of a number of fitful and ultimately futile attempts to establish comprehensive programming systems on country, regional and worldwide bases. It included: a study and report by a high level committee set up by Secretary Rusk (the Hitch Committee); the engagement by the Department of a consulting firm to help develop a system (Stanford Research Institute); the employment by the Under Secretary of a distinguished professor to direct the development of the system (Thomas Schelling, but he withdrew before he was fully on the job). By mid-1967 CCPS and its successor, FAPS, were dead. Their only remaining vestige was (and is today) a much modified version developed by the Latin American Bureau for its region and known as the Country Analysis and Strategy Paper (CASP). Otherwise, all the leaders, personnel, machinery, and experience of CCPS and FAPS were lost.

This almost total collapse seems, on the surface, a considerable waste of time, energy, technique and money. But there are lessons to be gained which may be turned to profit in the future. Why did it fail? And why did PPBS on an agency base continue to grow and develop, even

² For its adherents, at least, the story had all the elements of a Greek tragedy. A full account, entitled *Program Budgeting Visits Foreign Affairs*, has been written by Frederick C. Mosher and John E. Harr and will be published in 1969 by the Inter-University Case Program.

though its success to this date seems to be spotty? (It has been abandoned in some of the foreign affairs fields, including most of the State Department itself.)

In the first place, it does not appear that the differences between CCPS and PPBS in relation to their long-range purposes were very significant. The proponents of both, according to their own statements, sought a system in which budgets would be based upon programs, in turn defined in terms of American objectives. Both thought the base should be the foreign country. Both envisioned that the Secretary of State and his organizational machinery within the Department should ultimately provide the leadership.

Nor does it appear that differences in technique were decisive. True, the critics of CCPS, mainly in the Bureau of the Budget, thought it was unnecessarily detailed and cumbersome—"a glorified bookkeeping system" one called it—and deficient in not stressing analysis. And the CCPS advocates in the Department of State criticized PPBS because they felt that there was not an information base on which to build an analytical system. But these were differences of timing more than they were differences in technique. They could surely have been bridged.

The fundamental differences were tactical—how to get from here to there—not strategic, the locus of "there"—or technical. And these tactical differences were sharp and decisive. Some of them are indicated below:

	State Dept. Group (CCPS and FAPS)	Bureau of the Budget (PPBS)
base	geographic-country	functional-agency
organizational responsibility	State Department— Ambassadors	Bureau of Budget— agencies
emphasis	information gathering	analysis and programming
relation to budget	not immediately related	tied in with budget process (hopefully)
inputs and outputs	emphasis on inputs	more emphasis on outputs
classification of inputs and outputs	common system for all agencies	each agency to determine its own
conceptual approach	managerial	economic
policy base	National Policy Papers (where available)	objectives to be prepared by agencies
installation:		
locus	field	agency headquarters
mode	persuasion and consent	directive
pace	experimental, gradual	immediate

It is impossible, *post facto*, to attribute these sharp differences to any one cause or to allocate the degrees of difference among different causes with precise weights to each. On the other hand, the exploration of some of the likely sources may provide a basis for intelligent judgment and guidance for the future. Many of them are embedded deeply in the histories of agencies and institutions and in the minds, motivations, and perceptions of men. They were there long before CCPS or PPBS came along and are still there for any future reformers who seek similar or related kinds of changes. It may be noted too that most of them have their counterparts in other fields of governmental en-

deavor; the foreign affairs experience should be of some interest and value to those who would impose a PPBS or a comparable reform in domestic programs.

The discussion which follows will treat some of these underlying factors in terms of the four propositions presented in the first paragraph of this paper: the loci of power; the environmental context; organizational culture; and institutional change.

THE LOCI OF POWER

*The Department of State vs. Other Agencies*³

The missionaries of CCPS in the Department of State sought to strengthen the Secretary and Under Secretary, the regional Assistant Secretaries, and the Ambassadors abroad; in fact, this was very nearly their central purpose. They hoped that a system of country-based programming-budgeting which covered the overseas activities of all Federal agencies would provide an instrument through which the Department at each level could effectively plan, direct, and control American foreign affairs. In this, they thought they were pursuing and implementing the expressed intention of every President since Truman, and, most cogently, President Johnson in his NSAM 341. Their system would provide the information, the forecasts, the program options and ultimately the linkage with the budget whereby the nominal authority of the Department would become real. Further, it would provide an instrument through which American objectives, as expressed in the National Policy Papers, could be given effect. In short, they perceived CCPS as part of a much broader strategy whereby the Department of State would exercise true authority and responsibility over foreign affairs.

As they saw it, CCPS would have served a much more fundamental purpose than providing techniques for improving decision-making about programs and budgets. It was a basic challenge to the existing *realpolitik* of foreign affairs administration. Decisions would be made by the Department of State subject to other agency appeal, rather than the other way around. In this regard, CCPS was far more radical than PPBS as it was defined and guided by the Bureau of the Budget. For PPBS on an agency base would potentially improve decision-making in an agency context, not necessarily in a total foreign affairs context. It would strengthen the agencies in developing their own plans, programs and budgets internally. It would certainly not strengthen the Department of State in regard to the programs of other agencies and might have the opposite effect. The latter possibility was argued with some vigor. The CCPS proponents feared that strong agency PPB systems, developed more or less autonomously, would make it more difficult for the State Department to challenge agency decisions, would weaken even its appellate capacity, and would aggravate the problems of developing integrated foreign affairs programs in the

³The expressions "other agencies" and "other agency" are used throughout this document to mean agencies other than the Department of State which are involved in foreign affairs. They include principally: the Department of Defense and the military services; agencies whose primary missions are in foreign affairs (whether or not officially under the Secretary of State), such as AID, CIA, Peace Corps, and USIA; agencies whose primary missions are domestic but which have responsibilities overseas, such as the Departments of Agriculture, Commerce and Labor and agencies such as AEC and NASA.

future. The Budget Bureau response was that the best first step—if not the only realistic one—was to build each agency's capacity for PPBS, to permit State Department review and even appeal on agency submissions, and later to build an integrated foreign affairs PPB system on the basis of the separate agency systems.

The issue of the agency-based PPBS vs. the country-based CCPS is of course a manifestation of a very old issue of organizations generally: functional vs. geographic. Since the late nineteen-forties, the primary line organizations within the State Department have been geographic: regional assistant secretaries, the country desk officers (more recently country directors) in Washington, the Ambassadors in the field. On the other hand, most of the other foreign affairs agencies are groupings of functions to be carried on around the world. Within many of them, it is true, there is a geographic breakdown by regions and/or countries. But the primary mission is in terms of the functions of the agency wherever they may apply, not the locus of application. And whatever may be the rhetoric about State Department hegemony over foreign policy, most of the realities of history and of current practice favor the agencies. Each has its own powers and responsibilities, whether authorized by statute or executive order or delegation. Each has its own budget and the accountability for its use, and its own set of sub-committees to deal with in Congress. Each hires its own personnel, controls their assignments, and commands their loyalties.

Obviously, a system of programming and budgeting which included the activities of all agencies in individual countries and whose primary channel was from Ambassador to Regional Assistant Secretary to Under Secretary and Secretary of State could be threatening to the autonomy of individual agencies. And the other agencies had understandable and legitimate grounds for apprehension of enlarged State Department control. Each had its own mandated mission, its concept of purpose which might (or might not) fit neatly within the State Department's view of American purpose. For example, AID had long and sometimes bitter experience in resisting what it perceived as the short-range, political bias of the State Department in the allocation of AID funds on individual projects. The military viewed its assistance program in the context of American national defense in competition with other defense resources, only secondarily as an instrument of foreign development. The Department of Agriculture viewed its overseas programs in the contexts of the interests of American farmers and agricultural industries and of the handling of surpluses. The Peace Corps sought, to the extent possible, to divorce itself from identification with the American "establishment" abroad, and the core of that establishment was the State Department. And so on.

Ours is a pluralistic government in foreign affairs as in other fields. And the centrifugal forces seem usually more than a balance for the centripetal ones. CCPS, if effective, might swing the balance the other way; PPBS would not—or at least not immediately.

Washington vs. the Field

I have noted that budgetary reform in American experience has usually had the effect—and probably the intent—of centralizing decision-making at higher levels of organization. This was certainly one

of the results of PPBS in the Defense Department. In its first several years it was almost exclusively a Pentagon operation and a principal instrument of the Secretary of Defense in strengthening his control over the military services.

PPBS, as it began in the foreign affairs agencies, would probably have less centralizing influence since the power bases of most of the agencies were already pretty firmly centered in agency headquarters. In its first year, AID and Peace Corps directed submissions of program memoranda from their country outposts—or some of them. But for most, PPBS was entirely a Washington undertaking. Insofar as it became effective, it is likely that its influence during the early years at least would be to strengthen agency headquarters vis-à-vis the field by providing better information and analysis relative to inter-country and inter-program tradeoffs.

Here again, CCPS ran a different, a harder, and a more radical course. Lacking high-level support or even understanding in most of the State Department and in the headquarters of other agencies, it was almost forced to go to the field at the outset. It built on the authority stipulated in President Kennedy's May, 1961 letter to the ambassadors, and went directly to countries whose ambassadors were receptive or could be persuaded to accept it. At that time, of course, there was no NSAM 341 to provide a Washington foundation. Furthermore, there was no clear way to tie it with the agency budget process; most agency budgets went directly from the agencies to the Bureau of the Budget with little or no State Department intervention (although the ambassadors could and often did review and suggest amendments to agency submissions from their countries). The early result of CCPS, to the extent it was effective, thus would have been to strengthen the hand of the ambassadors in their relations both with the representatives of other agencies in the field and with the Department in Washington.

Under such circumstances, however, CCPS was on an uphill course. Ambassadors could be severely embarrassed in taking positions on the programs and budgets of other agencies and being effectively vetoed by the latter's headquarters. There was in Washington no reliable machinery for making ambassadorial recommendations effective, for translating them into the budgets of other agencies over which the State Department did not have, or would not assume, authority. Whereas PPBS built upon existing power bases (agency headquarters), and gave some promise of strengthening them, CCPS built on the quicksand of a President's letter and could not generate enough headquarters support. As one ambassador told me: "When it comes to an open confrontation (with field representatives of other agencies), in most cases if I try to make an issue which will be carried upstairs, it is pretty likely I will lose. They know it and I know it."

Power Within the Department of State

Ultimately, therefore, the issue of power and CCPS or PPBS rested upon the issue of power in the Department of State in Washington, power in relation to other agencies, and the distribution of power within the Department itself. I shall approach these topics from three interrelated standpoints: the relation between operations and policy, the relation between administration and substance, and the problem of leadership at the top.

Relation Between Operations and Policy.—Despite the various Presidential directives cited earlier—the abolition of the OCB, President Kennedy's letters to the ambassadors, and later President Johnson's NSAM 341—the old distinction between operations and policy lingered on. The Department's primacy in the area of foreign policy was generally recognized, but it did not assert the direction or control over the programs, the budgets, and the activities of other agencies which would make those policies effective except, occasionally, on an *ad hoc* crisis basis. Its power over *operations* in foreign affairs, as distinguished from policy, remained minimal. The other agencies did not recognize such power, and the Department itself did little to establish machinery through which its influence might be channeled. (The principal exceptions were in the Latin American region with its interface with AID, its Latin American Policy Committee, and later the Latin American IRG and CASP.)

Relation Between Administration and Substance.—The dichotomy between policy and operations was in a sense reenforced by another one within the State Department itself: between "substance" and "administration". "Substance" in the Department of State means approximately diplomacy (the carrying on of official and political relations with other nations and with international organizations) plus foreign policy. Some might reluctantly include consular operations. Administration means the provision of support for the "substance"—personnel, finance, communications, supplies, etc. The division between the two in the Department runs very deep. Resistance of substantive units and officers to feared incursions upon their territory by administrative "types" is vigorous and endemic. It has had a long history, particularly in relation to efforts to change the Foreign Service personnel system.

Although in its early beginnings, CCPS was attached to the Latin American regional bureau, through most of its career it was located within the administrative wing of the Department and led by administrative "types". Although it was not directly associated with the Department's budget office, which was also located in the administrative sector, and although its leaders insisted that, once established, it should be run by the substantive bureaus, it never escaped the administrative taint among most of the Foreign Service. It was perceived as another "gimmick" through which administrative personnel were seeking to influence the substance of foreign affairs. It may be noted that PPBS, when it reached the Department in 1965, was also operated in the administrative sector and suffered somewhat the same fate. (After one try, the Department was excused from PPBS except in connection with international educational and cultural exchange programs.)

The Problem of Leadership at the Top.—The office of Deputy Under Secretary of State for Administration, then filled by Mr. William J. Crockett, was strong and prestigious enough to carry CCPS to the field for experimentation, but it lacked the muscle to overrule the doubters among the substantive officers. Crockett's best hope was to obtain the vigorous support of the very top political officers—the Secretary, the Under Secretary, and the Assistant Secretaries.

It is interesting, though not particularly useful, to speculate on the administrative outcome had President Kennedy in 1961 appointed Robert McNamara as Secretary of State and Dean Rusk as Secretary of Defense. Would Rusk have brought in Charles J. Hitch and insti-

tuted PPBS in Defense? Would McNamara have done so in the field of foreign affairs? If so, could he have succeeded to anywhere near the degree he did succeed in Defense? Certainly the personalities, the managerial orientation, and the styles of Rusk and McNamara differed widely, and I would guess that the latter would have pursued the effort more aggressively. But Rusk, and Under Secretaries Ball and Katzenbach, as well as most of the senior officials under them came closer to the image of top State Department officers, as perceived both within and outside the organization. Heavily engaged in putting out diplomatic fires, in attending conferences, in advising, representing, and defending the President, they had little time and probably little disposition for "executive management" in the usual sense of the term. Crockett obtained from his superiors occasional nods, occasional expressions of interest in CCPS and his many other managerial initiatives. But there was no push from above, no sustained interest, little assurance of support. One ambassador told me: "When the Secretary says 'GO' loud and clear and makes everyone understand that he means to have it done, then we can fit the (programming-budgeting) pieces together without much difficulty. But until then, why pass our time discussing something that will probably never happen."

But whether a Secretarial "GO" would have been enough is open to some question. The problem of foreign affairs leadership is not only a product of the mix of individual personalities, interests, and capabilities at the top. It is, in small part at least, a legal problem: the President himself lacks full legal power over all the agencies operating in foreign affairs, and the Secretary of State is in a much more limited position in dealing with other Cabinet members, such as the Secretaries of Defense and Agriculture, and with agency heads, such as the directors of CIA and AID. More importantly, it is a political problem, in which the Secretary of State must deal with agencies some of which have far more clientele and congressional support than he has. It is also an institutional problem. Whatever the Presidential directives have stated, the Department of State and its Secretary are not yet recognized as the directors and semi-final arbiters of foreign affairs programs in Congress or among the public at large. Further, Secretaries of State and their Under Secretaries are not usually chosen on the basis of their managerial competence. And if they are, they are unlikely to be long remembered or widely loved for managerial innovations.

Summary Comment

I would summarize these observations about the loci of power in two related generalizations.

First, the institution of a new system entails a firm expression of intent at a very high level, some flexing of administrative muscle in the first instance. The paper authority for comprehensive programming was there after the NSAM 341 of March, 1966; but lacking firm and aggressive affirmation from the top, little progress has been made.

Second, a new kind of system of management, if it becomes effective, will almost certainly bring about shifts of greater or less degree in the degrees of influence of different offices and groups, whether or not these are reflected in organization charts. The shifts which would have

been entailed by CCPS would certainly have been far more extreme than those involved in PPBS as it was promulgated by the Bureau of the Budget, which built upon the existing power bases.

THE FOREIGN AFFAIRS CONTEXT

There are a number of objective features of the foreign affairs setting which make it difficult for the establishment of a programming-budgeting system, especially one which aspires to functional comprehensiveness. One is that a good many foreign affairs activities are simply not "programmable"; they involve simply "being there" or in the jargon of Foggy Bottom "maintaining a presence"; or they involve providing a capability to respond to the decisions and actions of others—whether they be foreign visitors, American travelers or American business overseas in the case of consular services, or foreign nations in the case of diplomacy and strategic planning. (The same is of course true of a good many other public enterprises, including a large part of the military establishment.)

A second limitation arises from the fact that many decisions in the foreign affairs arena, probably the most important ones, are not budgetary; they do not grow out of the budget process as they might for example in production enterprises; and they may have little or no impact upon future budgets. The principal determinants of such decisions are qualitative, not reducible to dollars or to other countable units. I should note however that this was and remains one of the principal points at issue. The advocates of programming systems, whether PPBS or CCPS, argued that more quantitative data and the analysis thereof would result in better decisions in some of those very areas where decisions are made only on the basis of qualitative judgment.

A third problem is the evaluation of outcomes in relation to objectives and inputs. This applies particularly to some activities, such as those of USIA, the principal purposes of which are to affect the minds of other peoples. Even when and where it is possible to conduct attitude surveys it is never possible to more than infer the degree to which attitudes are affected by specific activities of the U.S. Government. Likewise in the field of foreign development, American contributions are usually only a very small share of any foreign economy. Most U.S. aid is "seed" money, a catalyst to stimulate the actions of the local people. Evaluating the effectiveness of any AID program requires again the drawing of inferences about how much of the outcome is a result of American action, how much of it would have happened anyway. The same kind of problem attends most Federal domestic programs which operate through grants to states and local governments and to private institutions; the ultimate outcome depends upon the actions of others.

A fourth difficulty is the extraordinary complexity and virility of political forces in the foreign affairs arena. They include not alone almost every manner of domestic institution, interest group, political party and bloc, Congressmen, ethnic group, etc.; they also include foreign governments, foreign business interests, and foreign peoples. No agency budget annually arouses a fiercer storm than that of AID. Few government agencies must entertain and be investigated by such

a number and variety of Congressmen as do many American missions abroad. No one has yet invented a way to pump these political forces into a computer. Yet they are an important factor in most overseas programs.

The final difficulty, applicable particularly to any comprehensive program-budgeting system in foreign affairs, was stated simply and bluntly by Professor Thomas C. Schelling: “. . . the budget does not yet exist to which PPBS might be applied in the field of foreign affairs.”⁴ The relevant appropriations are multiple, scattered among almost every agency in Washington and considered by every appropriation subcommittee in Congress. Some of them, along with the authorizing legislation behind them, are in such detail as to leave little room for agency maneuver. Some of them, especially for AID, are customarily chopped severely in Congress and also customarily arrive late in the year, forcing quick patchwork decisions which may nullify the long and detailed deliberations that entered into the agency's budget process. One can make a case that these considerations are really arguments *for* a comprehensive programming system since it would offer some possibility of introducing more rationality into the decision-making process. Perhaps so. But certainly they introduce enormous difficulties.

ORGANIZATIONAL CULTURE

An organization may usefully be viewed as a complex system of roles, by which is meant in simplest terms a set of expected behaviors associated with individuals in different positions and groups. In new organizations, roles tend to be loose, vaguely specified, and dynamic. As the organization matures, they tend to harden and become more resistant to change. Thus the Peace Corps in its first year or two contained only the most uncertain specification of roles, but as it has “grown up” they have become clearer and more binding upon the behavior of their occupants. It may be noted too that roles tend to acquire a moral flavor. They become “approved”, fitting and proper. Open violation by an incumbent of a strongly felt organizational role is akin to a misdemeanor, a crime, or treason against the organization. The existence of role conflicts within complex organizations—i.e., differing views of the appropriate behaviors to be associated with different positions and groups—is probably endemic in some degree. Where it is minor, the organization is likely to be placid, stable and resistant to change. Where it is major, efforts to change may result in silent, sublimated unrest or, rarely, in open warfare and confrontation.

The innovation of a major new system by definition requires some modification of roles, and where those roles are of long standing, deeply felt and widely agreed upon, it may occasion intense resistance. Thus PPBS gave rise to a great deal of “static” among the military officers in the services and, later, among some of the “traditional” examiners in the Bureau of the Budget and elsewhere in Washington. It aroused relatively little resistance in AID where an economic programming system associated with the budget process was already well established; nor in the Department of State where it never found a foothold in the basic line bureaus and soon became virtually irrele-

⁴ In his memorandum to this Subcommittee of January 5, 1968.

vant. But a comprehensive programming system under State Department leadership as it was envisioned in CCPS and as it was authorized by NSAM 341 would necessitate a considerable wrenching of the approved roles of the higher officers of the State Department and its Foreign Service.

There is, I think, fairly widespread agreement in Washington and abroad as to what those roles are, although there are also a number of people both outside and within the State Department who think they should be changed. To a good many outside the Department, the new (potential) authorities and responsibilities were simply incongruent with the roles of the Department's personnel. They questioned the latter's capability to manage a programming-budgeting system, to make decisions with regard to problems outside of the accepted State Department orbit. When it was suggested that the capability might be increased by recruitment, training, and transfer programs (as indeed the Budget Bureau has sought to enlarge PPBS capabilities in other agencies), their response was usually that the Department and particularly the Foreign Service *would* not do so. One high Bureau official stated that a major reason, if not *the* major reason, that the Bureau went to the agencies with PPBS rather than working through the Department was that the principal officers in the Department "did not want it".

Very possibly, as some cynics suggested, there was a touch of "self-fulfilling prophecy" in such reactions. Why, if the Department lacked the capability and did not want to develop it, should others urge upon it responsibilities alien to its accepted role? Whether or not there is substance to this dark suggestion about the reactions of outsiders, there is abundant evidence of resistance to the role change implied by CCPS and by NSAM 341 among Foreign Service officers and particularly those at senior and most influential levels. They perceived themselves in their proper roles as diplomats, as policy formulators and advisers, not as executive directors of operations some of which were peripheral to foreign policy.

Even though the authors of both CCPS and NSAM 341 intended to increase the power over substantive decisions of Foreign Service and other State Department officers, the evidence is that the Budget Bureau official quoted above was nearly right; many of them did not want it.⁵ Crockett, principal leader in the campaign for CCPS, later wrote of the ambassadors (both career and political): "They didn't want to lead, didn't lead, and fought very successfully against being made to lead." Very probably most of the top officials of the Department and its overseas missions would not agree; they regard themselves as leaders. But their definition of leadership, of the role of the leader, would be a good deal different. For most of them, it would encompass the development of broad political objectives, the assurance that activities of other agencies did not negate or conflict with those policies, the maintenance of an effective American "presence" abroad, and the handling of political crises. Among those concerned with developing

⁵ However, a substantial and apparently increasing number of Foreign Service officers, particularly in the middle and lower ranks of the service, are interested and sympathetic. In fact, the recent report to the American Foreign Service Association entitled "Toward a Modern Diplomacy" specifically endorsed the idea that the Department of State "should do more and better planning and that there should be integrated planning and programming of resources under Department leadership."

countries, it would include consideration and recommendations on the allocation of American resources for developmental purposes. But it would not encompass "executive management" as the term is defined in the U.S. Bureau of the Budget or the International City Managers' Association or Procter and Gamble. It would not include the supervision of activities of American agencies other than the Department of State. It would not include the specification of long-range objectives, the analysis and determination of alternative programs to attain them, or budgets. It would not include, in general, the approaches and techniques suggested in the expression, PPBS.

The Collision of Professional Perspectives

The CCPS effort in the State Department would, if successful, have changed the role of the Foreign Service. PPBS, as promulgated from the Bureau of the Budget, bypassed that issue, by bypassing the Department. The three groups, CCPS, PPBS, and the Foreign Service, in fact represented three distinctly different professional orientations, each with its own system of values, capabilities, and workways. Each could lay claim to a specialized expertise and to its own brand of "rationality". But each defined its (and the government's) goals differently and projected different means of attaining those goals. What happened in the years of 1963 to 1967 was a collision of the three professional orientations: the economists (PPBS), the diplomats (the Foreign Service), and the management specialists (CCPS). As indicated below, a fourth group, social psychologists, added some spice to the stew.

The economists were relatively late comers to the foreign affairs field, except in AID, where they had exercised considerable influence for many years. The Kennedy and Johnson Administrations relied increasingly upon professional economic advice. Economic organizations, like the Council of Economic Advisers,⁶ and individual economists, mostly from the academic world, assumed growing stature in the government. This was exemplified by the economists' assumption of leadership in the Budget Bureau, the "whiz kids" in the Defense Department, and finally PPBS itself. The new leadership in federal budgeting consisted of a somewhat special breed of economists. Most of those at or near the top—only a handful in number—were equipped with experience and training in the analysis of governmental programs and their costs, gained in the RAND Corporation and/or in the Department of Defense. They brought with them a faith that the modes of economic thinking and technique were or could be made useful, even essential, in decisions on resource allocation in most fields of governmental endeavor, including foreign affairs. Their approach reflected a fundamentally economic view of the world, wherein the idea of the *market* was central. In the absence of a perfect market—as in many public undertakings—the tools of market analysis were still deemed applicable. One's need was to determine objectives, set forth alternative means for reaching these objectives, price each of them, and buy the one that was cheapest (most economical). The development of both alternative objectives and alternative means, as well as the

⁶ See, for example, Walter W. Heller's *New Dimensions of Political Economy* (Cambridge: Harvard University Press, 1966), especially Chapter I.

choice among them, depends heavily upon hard data, hard thinking, and sophisticated analysis. Reliable analysis must rest upon quantitative (countable) data, as to both costs (dollars) and product (translated into dollars). Many significant decisions on resource allocation in foreign affairs should thus be rational, objective, quantitative, depersonalized, de-bureaucratized, de-politicized. They should be reached only after careful analysis, preferably conducted by persons trained in techniques of economic analysis.

The world view of the *traditional diplomats* was and is almost the antithesis of that of the economists. Deriving from a long history of international diplomacy, they view themselves essentially as *representatives* of the head of state (President) before the heads of foreign states. These relationships are heavily *personal* and, in the larger sense, *political*. Until quite recently, they have had little to do with significant decisions on resource allocation, and today they are more interested in the political than in the economic implications of such decisions. They are not skilled in, or disposed toward, quantitative analysis. Important foreign policy decisions are the product of sensitivity, negotiation, sophistication—all developed through a broad, humanistic education and the experience of a diplomat.

Given this view of the world and of the conduct of foreign affairs, rather few experienced and senior diplomats could develop much enthusiasm for a systems approach, whether it be a PPBS or a CCPS. Among the many Foreign Service officers with whom I talked, there was little unanimity. Most were only vaguely familiar with PPBS or CCPS or any other "S"; a few were very knowledgeable. Some opposed it outright in any manifestation; others thought it might be useful in some places and with regard to some problems. But the general response was negative, and the general arguments were about as follows:

Diplomacy and most (or all) foreign policy decision-making are carried on in a world of enormous complexity. No system could possibly accommodate all the elements that must be considered, and systems would tend to bias the result toward those elements which are quantifiable. The *sine qua nons* of good decisions and effective diplomacy are education, experience, and good judgment, not computers.

Events beyond U.S. control are occurring so rapidly that the first requirements of our overseas operations are sensitivity, flexibility, and changeability. Long-range planning in such a world is useless if not impossible; if it were made effective through a systems approach, it would tie our hands. Diplomacy must be played by ear.

The most important foreign policy decisions (many, most or all of them) have little or nothing to do with the allocation of resources and little impact upon the budget. It would be a serious mistake (or it would serve no purpose) to tie foreign policy-making with the budget process (except, some would acknowledge, in certain fields like foreign aid.)

It is virtually impossible (in many or most or all) foreign affairs activities to measure outputs in terms of

national objectives. Cost-effectiveness analyses in these fields would be futile or even seriously misleading by directing attention only to things that might be measured and ignoring other, perhaps far more, important outputs. Some of the most important and effective decisions in foreign affairs are virtually costless in terms of dollars. Foreign affairs (all of it or most of it) is ultimately political in purpose; and politics can't be measured.

The Defense Department model is inappropriate for foreign affairs. Defense has an enormous budget, and a very large part of it goes into weapon systems, equipment, and research and development. The most important of the dollars spent in foreign affairs goes into salaries and even Defense has not (yet) pumped its personnel costs into PPBS.

A systems approach (PPBS or CCPS) simply adds another layer to the existing excess of reports and paperwork.

The reaching of important decisions in foreign affairs involves the bringing together and the accommodation of a great variety of interests in the administration, in the Congress, among the American public, and overseas. A system could hardly accommodate these.

During the course of these efforts to introduce programming in State, there was actually a minimum of direct confrontation between the economists and the diplomats. The battleground between them, ultimately to become a no-man's land, was occupied by the *management* group headed by Crockett and identified with CCPS and FAPS. These management specialists—like their counterparts in the Bureau of the Budget and other public agencies—were most interested in the development of a system, including planning, organization, procedures, information and communications, timing, etc., that would improve the overall management performance of the agencies concerned. In foreign affairs, programming and budgeting were viewed as tools, not only of rational decision-making on individual problems, but also for the integration of power under the ambassadors, the State Department, and the President. Not economists themselves, they perceived economic analyses as a useful and necessary part of the system, but not its heart. The heart was management. It is interesting to note that some of the leaders themselves came from the Bureau of the Budget; and some of them later departed for the Bureau. It is also interesting that the majority of those associated with the programming effort in State were Foreign Service officers. The programming group drew from both sides.

Yet this group was attacked from both sides too—and finally crushed between them. This was partly an expectable consequence of the three differing professional views of the world of foreign affairs, summarized above. Partly it was a product of clashes between three professional "empires," in which the management group—like Belgium in two world wars—stood between the other two. At least some of the Foreign Service officers perceived Crockett's programming effort, along with

his other reform proposals, as an aggression by administrative personnel to take over the "substance." The FSO's criticized the program personnel for their lack of experience in—and therefore understanding of—the real problems of foreign affairs. On the other side, the economists from the Budget Bureau, Defense, and RAND perceived them as a "breakwater" to obstruct the rising wave of influence of economists in federal management. They criticized them as "tinkerers" who were not getting at the "guts" of the problems, as "simple-minded," and (by clear implication) as not being economists. It should be borne in mind that, at the time, the argument in foreign affairs was only a skirmish in the more general offensive to establish PPBS throughout the government; some of that battle was going on within the Bureau itself.

A fourth professional group, principally *social psychologists*, were brought to the scene by the management group in a variety of consulting and training capacities. They influenced the later thinking and strategy of Crockett and his staff on how to bring about organizational change, with particular emphasis upon motivation, inter-personal communications, and attitude change. Although it is doubtful that their influence upon the Foreign Service (particularly in the sensitivity training groups) much affected the outcome of the programming effort in the short run, their long-term impact may yet be substantial. However, they had little contact with the Budget Bureau. Their influence was not brought to bear until late in the game, and it is even possible that its net effect was negative. They aroused suspicions among some of the officers about Crockett's many innovative proposals, including CCPS.

The "Living Systems"

The staff which Crockett recruited in the State Department to develop and install a comprehensive programming system were mostly young men in their twenties and early thirties. A number of them were junior Foreign Service officers, and some came from outside. Few had very much responsible experience in foreign affairs. Yet their assignments required working with and influencing top officers of the Foreign Service, the State Department, and other agencies, far their seniors in both age and experience. They were bright, ambitious, upward-mobile, not particularly respectful of tradition and traditional thinking, sometimes impatient, and little worried about personal security in their jobs. Little wonder that they aroused criticism, defensiveness, and resentment among some of the senior officials with whom they worked. Very likely, the reactions of their seniors matched those of some of the generals, admirals, and colonels of the Defense Department toward McNamara's "whiz kids." Very probably the generation gap, or at least the spread in age and foreign affairs experience, aggravated the problem of effective communication and understanding; almost certainly it provided ammunition for those who would have criticized the programming system anyway.

To the differences in age and experience were added others generated by the personnel systems and the resultant differences in norms and commitment. The proponents of integrated programming sought change as rapidly as possible, not only in techniques and operating procedures but also in attitudes and concepts about the very nature of

foreign affairs. Here they were challenging strongly-felt norms, rooted in long and honorable traditions, and supported not only by current personnel practices that governed selection, promotion, and selection-out, but also by the systems of living and working together and of mutual accommodation, embedded in the various services themselves. The agencies, and more particularly their personnel systems, would survive Crockett and his colleagues as they had survived a good many Presidents and Congresses. In a perceptive recent monograph,⁷ Chris Argyris described some of the behavioral consequences of the “living system” and the norms of the Foreign Service, including:

- withdrawal from interpersonal difficulties, conflict and aggressiveness;
- minimal interpersonal openness, leveling and trust;
- mistrust of others’ aggressive behavior;
- disguise of emotional responses and feelings;
- emphasis upon the substantive, not the administrative activities;
- loyalties to others in the system.

As Argyris suggests, most of these attributes apply in greater or lesser degree to other established personnel systems that have had an extended past and have expectancy of an extended future. The foreign affairs personnel of AID, USIA, the Department of Defense, and others are very likely to be in a similar cast, though in varying degrees. The programming group, young, ambitious, uncommitted to the Foreign Service “living system” was quite different in almost all of the above respects.

Differences in the “living systems” provide a hospitable environment for differences of opinion. Although there were few examples, and only a few more intimations, of opposition to CCPS (or PPBS) by senior officers of the Department and Foreign Service, a good many participants and observers would attest that such opposition was present, was powerful, and may have been decisive. The senior officers were polite, often passively receptive, patient, quiet, but, when the going was rough, non-supportive. There were few open confrontations and few written commitments one way or the other. There was no visibly organized resistance; yet the would-be innovators both in the Budget Bureau and the State Department feel that the resistance was there and in high places. Crockett later wrote: “The other opponent (other than the Bureau of the Budget) was the substantive areas of the Foreign Service who were no less in opposition than was the Bureau but whose opposition was never brought to open confrontation. Their opposition was exercised more subtly, but no less effectively, behind closed doors and over the diplomatic grapevine. It is my feeling that this latter opposition gave our program a mortal weakness—bastardized our product—so that we were no match for the Bureau when their confrontation came. Our product wasn’t agency based or agency needed or agency supported.”

Despite the permanence of the personnel systems involved—particularly the Foreign Service and the military services—and the long-range commitment they demand of their members, one cannot fail to

⁷ *Some Causes of Organizational Ineffectiveness Within the Department of State* (Washington: Department of State, The Center for International Systems Research, 1967).

be impressed by the short-range involvement of individuals in specific programs and positions. Of all the key figures involved in CCPS and PPBS, only one was in the same position at the beginning and end of the CCPS effort, Secretary of State Dean Rusk. Most of the others moved two or more times; most of the positions had three or more different occupants.

In various visits to posts in foreign countries, I was impressed by the temporary nature of most key field assignments and the transitory attitude of incumbents toward their position and country of assignment. A minority of those among the several hundred I interviewed expected to be at their posts for more than another year and one-half. All expected to rotate to another post or back to Washington before very long. Curiously, in those career personnel systems where the lifetime commitment is strongest—the Foreign Service and the military services—the post commitment is likely to be the shortest. Under current policies of relatively frequent rotation, an officer tends, soon after he gets his feet on the ground in his current assignment, to be concerning himself about his next one.

The development of a new system, such as one for programming and budgeting, can hardly produce many demonstrable results within two or three years' time. Yet few who might undertake to install and develop such a system could anticipate being there when its fruits (hopefully) might be reaped. There was little incentive to risk an innovation whose initial costs might be substantial, when the later benefits would probably accrue to someone else. It is ironic that the criticism often directed at political appointees—that the temporary nature of their appointments militates towards short-range goals and efforts—also applies to many career servants. Among all these people—the political appointees in Washington and the field and the career people in Washington and the field—the personnel systems operated against long-range commitments to programs that would not produce short-range results. To them, CCPS, FAPS, or PPBS could offer few attractions.

INSTITUTIONAL CHANGE

If we leave aside the arguments about the objective merits of *any* quantitative system and the relative merits of the CCPS approach versus the PPBS approach, the recent foreign affairs experience may shed some light upon the basic problems and conditions of effective institutional change. Assuming that CCPS represented a needed and desirable innovation, to what reasons can we attribute its total failure? What might have been, and might later be, the ingredients of success?

Scholars in the social sciences have produced in recent years a spate of literature about the problems and processes of change in and among organizations, change that is not spontaneous and reactive, but is intended and planned. I think it safe to conclude from these writings that no one has found a specific formula. Certain negative propositions, however, seem to be well supported. One is that, in a democratic and pluralistic society, real change is seldom accomplished by a simple fiat from higher levels in a hierarchy. Another is that real change is seldom achieved simply through better human relations among the parties concerned.

Students of organizational change today could not agree on the weights which should be attributed to various factors contributing to

planned organizational change. But they might agree on what some of those factors are. I suggest that they include :

- a top leader who will be continuously supportive ;
- a prestigious person, under the top leader, who will devote most of his energies to the effort ;
- participation of those officials who will be affected in the *design and development of the system* ;
- fluid communication among those concerned ;
- a basis of commonality of interest among diverse officials on *problems* of concern to all of them, and a focus of the system on those problems ;
- experimentation in those problem areas where a significantly useful product can be demonstrated—and advertisement of that product ;
- a few participants in the change effort who command prestige among the groups of officials whose support is mandatory ;
- legitimacy through official directives from above or from the Congress ;
- enlistment, from outside the organizations concerned, of assistance from experts both in the problem and in organizational development.

In governmental organizations, one should add to the list the support and preferably the active pushing of political figures in the Executive and Legislative Branches.

The CCPS effort fell short in a number of these respects although for reasons that were largely beyond the control of its promoters :

The top officers of the State Department, the Secretary, Under Secretary, and some immediately below contributed occasional but not active or consistent support, and only very seldom anything which might be termed leadership ; this reflected, in part, the inadequate communications between the programming group and the top echelons of the Department.

There was insufficient participation in designing and experimenting with the proposed system by those who would be most affected—hopefully benefited—by it, namely :

1. the substantive officers of the Department, at home and abroad ;
2. the officials of the other agencies, at home and abroad ;
3. the officials of the Bureau of the Budget.

This of course also reflected a failure of communications between the CCPS sponsors and the other groups, which in turn was a by-product of the identification of CCPS with the administrative “types” in the Department.

There was insufficient emphasis, during the developmental stages, on establishing a commonality of interest in those foreign affairs problems which were clearly

linked with one another for two or more of the foreign affairs agencies and in demonstrating how the system might benefit all of those involved in the solution of those problems. To the others, the system looked too much like a "gimmick" of State's administrative "types." Flowing from this, there was inadequate demonstration of what the system might do in helping on sample problems.

The programming group commanded too little prestige, either as experienced experts in foreign affairs or as experts in management systems among a fraternity in which prestige is important. Very probably full success would have required at least one or two prestigious figures from each of these sides.

Finally, there was insufficient (or too tardy) intervention and involvement from *outside* the foreign affairs community. Such external impetus may take several forms, of which three were illustrated in this case. One is through exhortations and directives from above, illustrated by the Presidential directives about PPBS and NSAM 341. A second is the provision of outside, prestigious expertise on the objective problem, illustrated by the Hitch Committee and the Stanford Research Institute. A third is the engaging of experts in organizational development whose instruments are the breaking down of communications barriers and creation of a climate whereby insiders can identify their own problems and find their own solutions. It was illustrated by the engagement of the social psychologists referred to earlier. NSAM 341 foundered in the Department's irresolution about making the SIG and the IRG's effective. The report of the Hitch Committee and the work of the Stanford Research Institute had no impact because of the travels of the principals and the ultimately unsuccessful negotiations with Thomas Schelling. And the organizational development efforts of the social psychologists came too little and too late to have much impact upon the outcome of the CCPS issue.

It is impossible to say which of these factors was decisive or whether it was a *gestalt* of all or several of them.

IN CONCLUSION

The earlier paragraphs of this essay laid heavy, perhaps undue, emphasis upon the real or alleged limitations of program budgeting in foreign affairs, at the expense of discussing its potential advantages. This is because the need for an orderly, unified and analytical system for planning and controlling our overseas activities seems to me so obvious. I am in full agreement with most of the views expressed to this subcommittee in favor of such a system. But sometimes we can learn more from our mistakes and failures than from our successes or from optimistic declarations and predictions. Quite possibly, President-elect Nixon will abolish the expression PPBS from the federal ver-

nacular; and he might rescind or severely modify NSAM 341. But it is unlikely that he would or could fail to support a more systematic approach to the problems of planning, programming and budgeting in the national government or a more coherent and comprehensive machinery for decision-making in foreign affairs.

I have also laid heavy stress upon the obstacles to institutional change and more specifically to the innovation of program budgeting in foreign affairs. This negative emphasis was similarly motivated by the hope that we might derive some therapeutic benefits from a recent failure. The more extensive account of the actual events to which I have alluded earlier³ suggests that the collapse of the CCPS idea may have been a very near miss. At certain crucial points in the story, events occurred which thwarted or diverted the development, many of them quite extraneous to the efforts of the developers. They included, for example, reassignments and replacements of key officials, overseas travel at significant stages, foreign uprisings such as the Guatemalan rebellion and the Dominican crisis, the Presidential concern about cost reduction, and many others. In fact, with a little bit more luck, it seems quite possible that the CCPS missionaries might have succeeded in spite of all their handicaps.

If the new Administration desires to establish a comprehensive program budgeting system in foreign affairs, it will have great advantages, particularly in its first several months. Among the ingredients for such an innovation I propose:

continuing indication of support from the top—the President and the Secretary and Under Secretary of State;

a prestigious, capable leader in the Department, who will dedicate all of his energies to the management of American foreign affairs activities;

a focus on *problems* of concern to several or all the major foreign affairs agencies, and involvement of representatives of the several agencies in tackling them;

participation in the design and development of the system by officials from the various agencies which it will affect;

experimentation in those problem areas where useful outcomes can be demonstrated, and advertisement of those outcomes;

enlistment from outside the organizations concerned of assistance from experts both in systems analysis and in organizational development.

Of the above, I would suggest that the second—the provision of a full time, prestigious leader—is the most crucial and the most indispensable. Establishment of a permanent office for such a person would itself be an expression of support from above, and on such an office would hinge all of the other ingredients. I know of no better prescription than the second recommendation of the Herter Committee: an Executive Under Secretary of State for foreign affairs.

³ Mosher and Harr, *op. cit.*

PLANNING—PROGRAMMING—BUDGETING

HEARINGS

BEFORE THE

SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS

OF THE

COMMITTEE ON
GOVERNMENT OPERATIONS

UNITED STATES SENATE

NINETIETH CONGRESS

FIRST SESSION

PART 1

WITH

CHARLES L. SCHULTZE, DIRECTOR, BUREAU OF THE BUDGET

AUGUST 23, 1967



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PLANNING—PROGRAMMING—BUDGETING

WEDNESDAY, AUGUST 23, 1967

U.S. SENATE,
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

[This hearing was held in executive session and subsequently ordered made public by the chairman of the subcommittee.]

The subcommittee met at 10 a.m., pursuant to notice, in room 3112, New Senate Office Building, Senator Henry M. Jackson (chairman of the subcommittee) presiding.

Present: Senators Jackson, Muskie, Harris, Mundt, Javits, and Baker.

Subcommittee staff members present: Dorothy Fosdick, staff director; Robert W. Tufts, chief consultant; Judith J. Spahr, chief clerk; and William O. Farber, minority consultant.

Bureau of the Budget staff present: Fred S. Hoffman, assistant director; Ellis H. Veatch, chief, military division; and William R. Thomas 3d, deputy chief, international division.

OPENING STATEMENT OF THE CHAIRMAN

Senator JACKSON. The subcommittee will be in order.

Since 1959, our Senate subcommittee has had a continuing interest in the role of the budgetary process in helping plan and control national security policy.

Today we open hearings for a frank stock-taking of the benefits and costs of the planning-programming-budgeting system, applied in the Department of Defense starting in 1961, and extended to most of the Executive Branch by President Johnson's directive of August 25, 1965.

Consistent with its jurisdiction, the focus of our subcommittee is on the operation of the PPB system in the national security area. Our approach is nonpartisan and professional.

Our inquiry has three major purposes:

One: There is now a substantial experience with the application of PPB in Defense, and with the struggles and experiments with PPB in other national security departments and agencies. The subcommittee wants to help the Executive Branch and the Congress draw the correct lessons from this experience.

Two: Even in Defense, the benefits of the PPB system have been oversold. It may be used as easily to rationalize a decision as to make a rational decision. It is no substitute for experience and judgment.

The subcommittee wants to identify the risks and dangers, as well as opportunities, in the application of the PPB process in the national security area.

Three: An important byproduct of this inquiry could be educational. PPB techniques are now being spread around the land. The American people need to know more about the experiments to date with the techniques of PPB and to understand both their possibilities and limits.

At my request three publications have been prepared by the staff. *Official Documents*, which contains Presidential statements on PPBS and current Budget Bureau guidelines; *Selected Comment*, which provides recent comment from different viewpoints on program budgeting, systems analysis and cost-effectiveness studies—key features of PPB; and an *Initial Memorandum*, which identifies the range of issues on which the subcommittee seeks counsel and will hold hearings.

With the permission of the members, I will include at this point in the record a copy of Senate Resolution 54, authorizing the funds for our subcommittee, together with the report thereon. Without objection, we will also place in the record the text of the *Initial Memorandum*.*

(The documents referred to follow:)

[S. Res. 54, 90th Cong., 1st sess.]

RESOLUTION

Resolved, That in holding hearings, reporting such hearings, and making investigations as authorized by section 134 of the Legislative Reorganization Act of 1946, and in accordance with its jurisdiction under rule XXV of the Standing Rules of the Senate, the Committee on Government Operations, or any subcommittee thereof, is authorized, from February 1, 1967, through January 31, 1968, to make studies as to the efficiency and economy of operations of all branches and functions of the Government with particular reference to:

(1) the effectiveness of present national security methods, staffing, and processes as tested against the requirements imposed by the rapidly mounting complexity of national security problems;

(2) the capacity of present national security staffing, methods, and processes to make full use of the Nation's resources of knowledge, talents, and skills;

(3) the adequacy of present intergovernmental relationships between the United States and international organizations of which the United States is a member; and

(4) legislative and other proposals or means to improve these methods, processes and relationships.

SEC. 2. For the purposes of this resolution, the committee, from February 1, 1967, to January 31, 1968, inclusive, is authorized—

(1) to make such expenditures as it deems advisable;

(2) to employ upon a temporary basis and fix the compensation of technical, clerical, and other assistants and consultants: *Provided*, That the minority of the committee is authorized at its discretion to select one employee for appointment, and the person so selected shall be appointed and his compensation shall be so fixed that his gross rate shall not be less by more than \$2,300 than the highest gross rate paid to any other employee; and

(3) with the prior consent of the head of the department or agency concerned, and the Committee on Rules and Administration, to utilize on a reimbursable basis the services, information, facilities, and personnel of any department or agency of the Government.

SEC. 3. Expenses of the committee under this resolution, which shall not exceed \$90,000, shall be paid from the contingent fund of the Senate upon vouchers approved by the chairman of the committee.

*Set forth in this compilation on pp. 3-16, inclusive.

[S. Rept. 20, 90th Cong., 1st sess.]

STUDY OF CERTAIN ASPECTS OF NATIONAL SECURITY AND INTERNATIONAL OPERATIONS

The Committee on Rules and Administration, to which was referred the resolution (S. Res. 54) authorizing an investigation of certain aspects of national security and international operations, having considered the same, reports favorably thereon without amendment and recommends that the resolution be agreed to.

Senate Resolution 54 would authorize the Committee on Government Operations, or any duly authorized subcommittee thereof, to expend not to exceed \$90,000 from February 1, 1967, through January 31, 1968, to make studies as to the efficiency and economy of operations of all branches and functions of the Government with particular reference to—

- (1) The effectiveness of present national security methods, staffing, and processes as tested against the requirements imposed by the rapidly mounting complexity of national security problems;
- (2) The capacity of present national security staffing, methods, and processes to make full use of the Nation's resources of knowledge, talents, and skills;
- (3) The adequacy of present intergovernmental relationships between the United States and international organizations of which the United States is a member; and
- (4) Legislative and other proposals or means to improve these methods, processes, and relationships.

The following table shows amounts authorized by the Senate for related purposes during the 87th, 88th, and 89th Congresses. Expenditures are shown through December 31, 1966.

GOVERNMENT OPERATIONS

Congress and session	Authority	Date	Authorized	Expended ¹
NATIONAL SECURITY AND INTERNATIONAL OPERATIONS ²				
87th.....			\$70,000.00	\$38,368.77
1st.....				
2d.....	S. Res. 332.....	May 17, 1962	70,000.00	38,368.77
88th.....			70,000.00	38,368.77
1st.....	S. Res. 13.....	Mar. 14, 1963	92,250.00	53,537.81
2d.....	S. Res. 279.....	Feb. 10, 1964	90,000.00	56,211.98
89th.....			90,000.00	56,211.98
1st.....	S. Res. 57.....	Feb. 8, 1965	90,000.00	64,724.21
2d.....	S. Res. 181.....	Feb. 17, 1966	90,000.00	57,044.77
			90,000.00	57,044.77

¹ Through Dec. 31, 1966.

² National security staffing and operations prior to 89th Cong.

³ 11-month basis.

Additional information relative to the proposed inquiry is contained in a letter to Senator B. Everett Jordan, chairman of the Committee on Rules and Administration, from Senator Henry M. Jackson, chairman of the Subcommittee

on National Security and International Operations of the Committee on Government Operations, which letter (with accompanying budget) is as follows:

U.S. SENATE,
COMMITTEE ON GOVERNMENT OPERATIONS,
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS,
(PURSUANT TO S. RES. 181, 89TH CONGRESS),
January 24, 1967.

Hon. B. EVERETT JORDAN,
*Chairman, Committee on Rules and Administration,
U.S. Senate, Washington, D.C.*

MY DEAR MR. CHAIRMAN: Reference is made to Senate Resolution 54, 90th Congress, 1st session, which was introduced in the Senate on January 24, 1967, requesting funds for studies as to the effectiveness of present national security methods, staffing, and processes, and the adequacy of intergovernmental relationships between this country and certain international organizations. The requested funds would cover the period from February 1, 1967, through January 31, 1968. Prior to submitting this resolution to the Senate, it was reported favorably by the Committee on Government Operations.

Attached hereto is an estimated budget for the period. It is estimated under this budget that it will require \$90,000 to carry on the inquiry during the present year. This represents no increase in estimated spending and is the identical amount authorized for our study during the last year.

As you are aware, our subcommittee is studying national security operations in Washington and abroad and is making findings and suggestions for improvement as appropriate.

In the 89th Congress, 2d session, the subcommittee conducted a study of the relations between the U.S. Government and the Atlantic Alliance. A major set of hearings was held on Atlantic Alliance operations. Published in seven parts, the hearings include testimony from distinguished witnesses of broad experience in the U.S. Government and in Atlantic Alliance affairs. In addition, the staff prepared both a report on basic issues in NATO, and a series of background studies relating to the alliance.

During this next year, the subcommittee is planning to continue its studies and hold hearings to audit the progress and performance of the executive branch in improving areas of national security operations. The staff and a number of the committee members have conferred with outstanding authorities on national security and Government organization at home and abroad in preparation for these studies and hearings.

Of the \$90,000 authorized for the subcommittee for the 12 months from February 1, 1966, to January 31, 1967, we expect to be able to return approximately \$25,000 to the Senate contingent fund. We found it possible this year to have the services of key consultants, including our chief consultant, on a part-time basis and in that way achieve a considerable saving.

As you know, our work is being conducted on a professional and nonpartisan basis.

The study is being made by the Government Operations Committee in accordance with its jurisdiction under rule XXV of the Standing Rules of the Senate, providing that the committee shall have the duty of—

“B. Studying the operation of Government activities at all levels with a view to determining its economy and efficiency;

“C. Evaluating the effects of laws enacted to reorganize the legislative and executive branches of the Government;

“D. Studying intergovernmental relations * * * between the United States and international organizations of which the United States is a member.”

I shall be available to give the committee any further information desired.

In connection with your request for information on office space assigned to committees and subcommittees, the Subcommittee on National Security and International Operations has one room (room 135) which provides working accommodations for three full-time “regular” occupants, and for the subcommittee’s several “regular” part-time consultants. In addition, the subcommittee has one small adjacent utility room (room 135-A).

Thanking you for your cooperation and with kind regards, I am,

Sincerely yours,

HENRY M. JACKSON,
*U.S. Senate, Chairman, Subcommittee on
National Security and International Operations.*

BUDGET

Position	Number	Base salary (per annum)	Gross salary (per annum)	Monthly salary (gross)	Total for period of budget (gross)
STAFF					
Legal and investigative:					
Staff director.....	1	\$8,040	\$22,230.09	\$1,852.50	\$22,230.09
Consultants, including the chief consultant and consultant to the minority.....	4-6				35,000.00
Editorial and research: Staff member (professional).....	1	4,020	11,352.88	946.07	11,352.88
Administrative and clerical: Chief clerk.....	1	2,940	8,318.14	693.17	8,318.14
Total.....	7-9				76,901.11
ADMINISTRATIVE					
Contribution to employees health benefit programs (Public Law 86-382, effective July 1, 1960).....					375.00
Contribution to civil service retirement fund (6 3/4 percent of total salaries paid).....					2,800.00
Contribution to employees Federal employees group life insurance (27 cents per month per \$1,000 coverage)					135.00
Reimbursable payments to agencies.....					1,000.00
Travel (inclusive of field investigations).....					3,000.00
Hearings (inclusive of reporters' fee).....					2,000.00
Witness fees, expenses.....					2,000.00
Stationery, office supplies.....					300.00
Communications (telephone, telegraph).....					900.00
Newspapers, magazines, documents.....					350.00
Contingent fund.....					283.89
Total.....					13,098.89
Grand total.....					90,000.00

Funds requested, Senate Resolution 54, \$90,000.

Senator JACKSON. In his original statement of August 25, 1965, directing the application of PPBS in the major federal agencies, President Johnson indicated that the system had been developed by his top management experts led by Budget Director Charles Schultze, and that its operation would be under the guidance of the Bureau of the Budget. Understandably, therefore, we asked Mr. Charles Schultze, Director of the Bureau of the Budget, to be our first witness in this inquiry. We are privileged to have him with us today.

Mr. Schultze has combined a distinguished academic career with very able service to the national government. From 1959 to 1961 he was Associate Professor of Economics, University of Indiana, and he has held the rank of Professor of Economics at the University of Maryland since 1961. Mr. Schultze's government service includes six years on the staff of the President's Council of Economic Advisers—from 1952–58. In 1962 he joined the Bureau of the Budget as Assistant Director, and became Director in 1965.

We greatly appreciate your coming here this morning, Mr. Schultze, and you may proceed with your statement.

STATEMENT OF CHARLES L. SCHULTZE, DIRECTOR, BUREAU OF THE BUDGET

Mr. SCHULTZE. Thank you, Mr. Chairman.

I want to thank the committee for inviting me here today to talk about the Planning, Programming, and Budgeting System (PPBS) as applied to national security and international affairs. This committee has an enviable record in providing materials and a forum for non-partisan debate about the exceedingly difficult problem of decision-making and management in the area of national security and foreign affairs. I am pleased to have the opportunity to participate in the committee's work.

Much has been published on PPB. Learned articles have treated it sometimes as the greatest thing since the invention of the wheel. Other articles attack it, either as a naive attempt to quantify and computerize the imponderable, or as an arrogant effort on the part of latter-day technocrats to usurp the decision-making function in a political democracy.

Mr. Chairman, PPB is neither. It *is* a means of *helping* responsible officials make decisions. It is *not* a mechanical substitute for the good judgment, political wisdom and leadership of those officials.

The need for PPB, along the lines we are trying to establish, stems from two sources:

First, the resources of the government are always less than we need to accomplish all the good and useful things that we would like to do. Therefore, among competing claims on resources, we must choose those which contribute most to our national objectives, and we must execute our choices effectively and efficiently in order to free scarce resources for other good and useful things.

Second, government programs rarely have an automatic regulator that tells us when an activity has ceased to be productive or could be made more efficient, or should be displaced by another activity. In private business, society relies upon profits and competition to furnish the needed incentives and discipline

and to provide a feedback on the quality of decisions. The system is imperfect, but basically sound in the private sector—it is virtually nonexistent in the government sector. In government, we must find another tool for making the *choices* which resource scarcity forces upon us.

Now to say that wise choice ultimately depends on good judgment is not the same thing as saying that good judgment *alone* makes for wise choices. Forced to choose among irrelevant alternatives, on the basis of misleading facts, and without the benefit of solid analysis, even the best judgment can do little but grope intuitively in the dark. PPB is a means to improve the decision-making process, in order to assist the final judgment, not to supplant it.

While I realize that the major outlines of PPB are familiar to you, let me summarize briefly its five major elements, as I see them, and then concentrate in some detail on several general aspects of PPB.

I ask your indulgence to spend some time on this general treatment, before turning to the national security and foreign affairs areas, because there are several features of PPB which have plagued understanding of it for some time. I would like to try to clear the air on these matters.

THE NATURE OF THE PPB SYSTEM

As the *first* step PPB calls for a careful specification and analysis of basic program objectives in each major area of governmental activity. The key to this part of the operation is forcing federal agencies to back away from the particular program they are carrying on at the moment and to look at their objectives. What are they really trying to accomplish? The objective of our inter-city highway program, for example, is *not* to build highways. Highways are useful only as they serve a higher objective, namely transporting people and goods effectively and efficiently and safely. Once this is accepted as an objective, it then becomes possible to analyze aviation, railroads and highways to determine the most effective network of transportation. But so long as we think of the ultimate objective of the highway program as simply laying concrete, this comparison of different transportation systems is impossible.

At the same time, while we want to view our objectives broadly we are not helped at all by stating them too broadly. Highways or transportation, for example, generally may contribute to the good life and to national unity, but to take these as our sole stated objectives does not tell us much, if anything, useful about the desirable rate of highway building, the character of the highways, their locations, or their relations to other elements of our transportation system. In the case of highways, we want a specification of objectives broader than "laying concrete" but narrower than "improving our national life". As a matter of fact, there is a constant interaction between the decision process and our knowledge of our true objectives. Often, the more we learn about *how* to reach an objective, the more clearly we begin to understand the objective itself.

The *second* step, under the PPB system, is to analyze insofar as possible, the *output* of a given program in terms of the objectives initially specified in the first step. Again, for example, in the case of highways, we must ask not primarily how many miles of concrete are laid, but more fundamentally what the program produces in terms of swifter, safer, less-congested travel—how many hours of travel time are eliminated, how many accidents are prevented.

The *third* step is to measure the *total costs* of the program, not just for one year, but over at least several years ahead. In this year's budget, for example, \$10 million in budget funds are requested for the Atomic Energy Commission to design a 200 billion electron volt atom-smasher. But the total cost of constructing this machine will amount to \$250 million or more. We have commonly had some estimate of the total capital cost in mind when we have embarked on construction projects. This has not happened systematically, however. And we can't stop here. Once the machine is built, the annual operating costs will run \$50 to \$100 million per year. This is not to say that because of these costs we should decide to abandon the project. But it does mean that we should be aware of all the costs when we make the initial \$10 million decision, not just the capital costs but the follow on operating costs as well. Or, to cite the highway example again, in deciding to build an expressway through a downtown area we must take into account not only the cost of the expressway, but also the cost of relocating the displaced residents and, in a qualitative sense, the effects of the freeway on the areas through which it is to run.

All of this sounds obvious. Yet, too often large federal investment decisions have been made on the basis of the first-year costs alone—or made without taking into account all of the indirect associated costs.

The *fourth* and crucial step is to analyze *alternatives*, seeking those which have the greatest effectiveness in achieving the basic objectives specified in the first step or which achieve those objectives at the least cost. In the highway case, for example, we should be comparing the effectiveness of additions or improvements to highways with that of additions or improvements to aviation and railroads as a means of providing safe and efficient transportation. This does not mean that we pick only one. Of course, we should not. But we do need to decide, at least roughly, which combination of alternatives is the preferred one.

By this process we hope to induce federal agencies to consider particular programs not as ends in themselves—to be perpetuated without challenge or question. Rather, they must be viewed as means to higher objectives and subjected to competition with alternative and perhaps more effective programs. It is this competition among alternatives which is crucial as a means of testing the effectiveness and economy of existing and proposed programs.

The *fifth* and final element of this approach is establishing this method and these analytic techniques throughout the government in a *systematic* way, so that, over time, more and more budgetary decisions can be subjected to this kind of rigorous analysis.

Merely writing up academic papers is not enough. The analysis has to be an integral part of the budgetary decisions. The programming concept is the critical link that relates planning to budgeting, converting planning from paper exercise to an important part of the decision process.

SOME SPECIAL CONSIDERATIONS

There are several aspects of this system which warrant special attention, in part because they have been subject to some criticism. Let me elaborate briefly on two of those aspects:

1. *Multi-year programs*.—PPB, particularly as it is presented in brief summaries and—I must admit—as we first conceived it, puts heavy stress on *forward programming*—on laying out for five or ten

years ahead a program of action in each major area of federal activity, be it highway construction, foreign assistance, or aid to elementary education.

Clearly, one cannot address the problem of the urban ghetto solely in terms of what can be done in a single fiscal year. If we restrict ourselves to such a narrow outlook, we will simply be rushing around putting band-aids on festering wounds. We cannot attack the problem of water supplies for the arid sections of the nation solely in terms of individual projects, or a slate of public works authorizations for a single year. Nor can we deal with problems of rising medical costs and scarcity of medical manpower by devising a series of one-year programs. After all, it takes 10 to 14 years to turn a high school graduate into a doctor. And a P.L. 480 program which ignored the long-run necessity to increase food production in the developing countries could, as we have begun to realize, do more harm than good.

A reasonable decision-making process must, therefore, provide the decision-maker with a perspective longer than a single year. Ad hoc solutions are often extremely valuable. But in dealing with deep-rooted problems pure "ad hocery" can become a destructive force rather than a tool for good. And so PPB lays great stress on forward planning as an essential aid to decision-making.

But here we come up against a dilemma. When the chips are down, no President, no Cabinet officer or Budget Director—or Congress for that matter—is really willing to commit himself in advance to decisions in 1967 about the specific level of Federal programs in 1970 or 1972. Nor should he be. There is nothing inherent, for example, in the nature of a P.L. 480 program which requires us to decide this year how much food aid we should provide in 1971 or 1972. The Elementary and Secondary Education Act—for which we have requested \$1.6 billion in 1968—could be funded at several very different levels in 1971, depending on the fiscal situation, competing needs, and our evaluation of the merits of the program at that time. Some of our programs are frankly experimental, and we want to examine the results before we *commit* to full scale activities—even though for *planning* purposes, we might assume a full-scale commitment. In other words, for most programs, our decisions today do not necessarily bind us to a particular level of those programs several years ahead. And there is no use pretending that we need make these decisions before we have to—indeed, making such decisions prematurely would be harmful.

At the same time, *some* of the decisions about this year's budget *do* imply legal or moral commitments about future budgetary levels. In the example I noted earlier, this year's decision about the 200 Bev accelerator clearly implies specific capital and operating outlays for many years to come.

A decision to shift the mix of airlift vs sealift in transporting and supplying our conventional forces abroad, carries with it a whole series of implications about future budgetary levels. It is essential that we know, program by program and, at least roughly, for the budget as a whole, what costs we are firmly committed to next year from this year's budget decisions. Unless we know this, we can find ourselves unknowingly foreclosing future options by current decisions.

How do we sort out realistically this tangle of conflicting needs and problems with respect to multi-year planning and budget figures? We have begun to approach it as follows:

- Each Federal agency, for each of its major programs, is asked to present and evaluate those programs in terms of long-run objectives. To the fullest extent possible, programs are to be analyzed and this year's budget request justified in the context of forward planning toward basic targets.
- But these long-run plans are not to be considered *commitments* on the part of the agency head. As you might expect, the sum total of all the forward plans of all federal agencies tends to exceed, by far, any reasonable projection of available resources. Consequently, the acceptance or rejection of this year's budget request is *not* to be considered an acceptance or rejection by the President of future plans. Rather, the forward planning is a means of *evaluating current decisions in the context of a comprehensive analysis of problems and alternative solutions*. It is an aid to current decision-making, not a premature commitment to future decisions.
- At the same time agencies will be required to specify the future-year budgetary consequences of current decisions. For example, HEW may present a program for assisting the construction of medical schools in the context, say, of increasing the supply of doctors 35 percent by 1975. Analysis of the rationale behind the 1975 target and knowledge of the future budgetary costs of reaching it are an aid to making current decisions. But the program, within reason, can be accelerated or decelerated in succeeding years as conditions require. Hence, acceptance of *this year's* program implies no commitment about the specific rate of progress toward the target in later years. The future year costs of reaching the target are treated as planning aids, not immutable decisions. On the other hand, if the particular program for medical school construction envisaged entering into advance five-year commitments to match medical schools' own construction outlays with federal funds, then we would insist on having an estimate of the federal costs over the full five years. For in this case, the current year's decisions will definitely commit the expenditure of federal funds over five years—there would be no options left open, on the downward side at least. And these kinds of future year estimates, we must have.

In short, then, we are encouraging multi-year *planning*; we do *not* consider the forward years' part of the plan as a decision or commitment; except where current decisions bind us to future year outlays.

2. *Mathematics, statistics, computers and the decision process.*—While our approach to the PPB in the past may, perhaps, legitimately be criticized for lack of precision about forward planning, there is another frequently heard criticism of PPB which stems, I believe, from a straight misconception as to what PPB is all about.

This criticism takes a number of forms. But basically it charges that PPB and cost-effectiveness analysis set up a bias in decision-making:

- By concentrating on the cost accounting elements of an issue and ignoring those human factors and intangibles which cannot be quantified; or, conversely,
- By naively attempting to put numbers on these essentially imponderable elements, thereby misleading the decision-maker.

Often this criticism is expressed in terms of an attack on PPB for trying to “computerize” what is essentially a political and judgmental process. Or sometimes it is expressed in terms of “not letting the statisticians and cost accountants take over.”

I might interpolate, Mr. Chairman, that on the basis of my experience in government, which is limited, I will admit, this fear of the statisticians and analysts taking over ranks about 28th on my list of fears, perhaps just below my fear of being eaten alive by piranhas. I have many fears of government, and this is not one of them so far.

Quite frankly, Mr. Chairman, these kinds of criticisms—however sincere—reflect a complete misunderstanding of the issue. And sometimes they simply reflect chagrin that particular pet projects do not show up well under the light of cost-effectiveness analysis.

PPB *does* call for systematic analysis of program proposals and decisions, concentrating upon those decisions which have budgetary consequences. But systematic analysis does not have to be and is not co-extensive with quantitative analysis. The word “analyze” does not, in any man’s dictionary, have the same meaning as the words “quantify” or “measure,” although analysis often includes measurement.

Systematic analysis is an aid to policy debate. Too often these debates revolve around a simple list of pros and cons. There are no means of making progress in the debate, since participants simply repeat, in different words, their original positions. Systematic analysis is designed to improve this process by:

- Uncovering the irrelevant issues.
- Identifying the specific assumptions and factual bases upon which alternative recommendations rest, and,
- Tracing out the knowable consequences and costs of each alternative.

By this means, systematic analysis is designed to narrow the debate, to focus it on the important issues, and—I underline and stress this—to separate those points about which the judgments of reasonable men can disagree from those which are demonstrably true or false.

Now such analysis often does, and must, involve quantitative estimates. Most of our decisions—in fact, all of our budgetary decisions—willy-nilly involve quantitative consideration. For example, take the question of how many doctors to train and how much aid to give to medical schools. We can debate this simply in terms of arguing more or less budget dollars for the program. Alternatively, we can calculate the current and projected ratio of doctors to population, examine the relationship between the doctor/population ratio and various indices of health, review the distribution of doctors throughout various areas in the nation, estimate the costs of training doctors, and a host of similar factors. We cannot, of course, measure precisely, or even close to precisely, the national advantages to be

gained from a program of aid to medical schools, nor can we account for all of the costs. But we can isolate, in a quantitative form, a number of the key elements involved in the program. The debate then can proceed in terms of weighing fairly specifically the advantages the nation gains from alternative increases in the supply of doctors against the costs of achieving each alternative.

Handled properly, a well constructed numerical estimate can be worth a thousand words. And, in PPB, we seek to encourage quantitative estimates, as part of the systematic analysis of budgetary issues.

But this, most emphatically, does not mean that quantitative estimates are the only elements of systematic analysis. The latter is far broader than the former. Human factors and intangible elements in a decision must not be ignored. And that which cannot reasonably be measured should not be.

In short, Mr. Chairman, PPB does not represent an attempt to "computerize" decision-making or to measure the immeasurable or to ignore the intangible. It merely seeks to subject to systematic analysis both the tangible and the intangible elements of a program decision.

PROSPECTS AND PROBLEMS

Let me turn to our prospects for PPB and some of the problems we are facing.

As you know, it was two years ago this month when the President instructed that PPB be installed in all major civilian agencies. Not surprisingly, the application of PPB to 21 agencies so far (36 agencies ultimately) dealing with a variety of national problems, has resulted in great differences in technique and result. Performance so far has been spotty, with great disparities between agencies and between constituent parts of agencies. This is due in part to differences in the extent to which agencies have worked out means of adapting and using PPB, and in part to the difficulty of the substantive questions involved.

From each agency we are requiring this year three formal kinds of submissions:

1. A *Program Memorandum* for each of its major program categories. These memoranda:

- Contain the major recommendations of the agency head for the coming budget;
- Identify the major issues involved in the recommendations, in terms of a selection from among alternative choices;
- Explain the basis for the recommended choice among those alternatives.

Realistically, we cannot yet expect that every choice be backed up by a full analytic approach. Analytic staffs are just being developed in many cases; and there are thousands of issues. But we have required that where the analytic base is lacking, the Program Memorandum at least contain a clear statement of the reasons which were employed in choosing the particular recommendations involved.

2. *Special studies* of individual issues. These studies, addressed to issues of particular importance, form the analytic background for many of the recommendations in the Program Memorandum. Work on these studies should be a year-round affair, not something confined to the few weeks or months before the budget is developed.

3. A *Program and Financial Plan* which lays out in tabular form the costs and, wherever possible, the outputs of agency programs. This is a multi-year table. For future years, the entries show the future-year implications of present decisions—i.e., they do not reflect future decisions but only the future consequences of present decisions.

Some of the major problems we face are:

- Maintaining a schedule that will permit PPB material to be used in the development of the budget. One of our problems here is the crowding together of the analytic discussion of major issues and the detailed budgetary decisions which follow out major program decisions. Ideally, we would like to schedule this so that we first make major program decisions and then translate them into detailed budget issues, but, given the human frailties of the agency and Budget Bureau staffs involved, the decisions tend to get crowded together. It is a massive problem to sort them out, because we must do all of it in three or four months. This is a real problem and we have not licked it yet.
- Linking broad program analysis to the budgetary decision process in terms of detailed appropriation requests: HEW alone, for example, has 116 separate appropriations;
- Securing appropriations for, and developing, experienced PPB staffs appropriately placed within the agencies to improve the quality of their planning processes;
- The difficulty of obtaining relevant data;
- The problem of defining program benefits in concrete and specific ways;
- The application of PPB to programs which require participation by federal, state and local governments;
- Finally, convincing harassed and skeptical agency officials of the utility of PPB in their operation.

The list of problems is formidable, but I believe we are making progress. The Program Memoranda this year appear to be more useful than last, in terms of form and focus, if not in terms of analytic content. I think that a number of the documents this year will at least provide useful summaries of program strategy.

I look forward to substantial improvements next year in terms of schedule, understanding of the role and desired character of the Program Memoranda, and perhaps more important, in terms of their analytic content. Analytic staffs have been assembled and have had a chance to shake down; a number of data collection efforts and long term study efforts should reach fruition; and we are learning how to state program issues in a way that facilitates analysis and comparison. We have not yet by any means achieved my expectations for the system. That is partly because I have such high expectations for it.

Ultimately I expect we will realize those expectations.

PPB IN NATIONAL SECURITY AFFAIRS

Ever since the passage of the National Security Act in 1947, there has been steady progress toward greater coherence in Defense policy. Despite this progress, in 1961 there were still some serious defects in the process by which the United States allocated its military resources:

- Each service developed its own programs* without any way to compare them systematically with competing programs of other services.

- Military requirements were unrelated to costs, and, therefore, had little or no effect on resource allocations in the program and the budget.*
- The time horizon of the budget was limited to one year; thus future costs of programs were not brought into the decision-making process.*

These defects can be summed up by saying that there were major impediments to making decisions in terms of a coherent national defense policy. There was no way that the President, the Secretary of Defense, and the Joint Chiefs of Staff could ascertain that there were neither undesirable overlaps nor gaps among the missions of the Services, that the forces necessary to fulfill these missions existed or were planned, and that the most efficient means of fulfilling these missions had been chosen from among alternative possibilities.

The system that has been established under Mr. McNamara is an attempt to remedy these shortcomings, and I believe it has been a highly useful effort.

The PPB system which we are developing in civilian agencies is based upon—but is not a part or a slavish imitation of—this effort.

This committee is fully familiar with the basic elements of the Defense Department's Planning, Programming and Budgeting System. There is no need therefore for me to summarize it here. The committee may find it useful, however, if I briefly indicate some of the problems in the system which remain to be solved, at least as I see them.

1. *Timing of the budget and program review cycle.*—Ideally, basic and broad program decisions should be made first, as the basis for a later set of detailed decisions in the budgetary context. But no one, including the Secretary of Defense, wants to make up his mind on tough program issues any sooner than he has to. This is understandable—even a Budget Director can understand it. And up to a point, it is desirable; but it makes it hard to get the major program decisions tied down as a basis for the budget submission. Let me say however, that PPB—with its Program Memoranda and emphasis on program oriented decisions—simply brings this problem more clearly into the open. In the traditional pre-PPB approach, the problem was much worse—the entire decision process was collapsed into a few months. Under PPB the dialogue can at least begin earlier (and in some cases be resolved earlier), so that by decision time the various parties have a clearer understanding of the cost and effectiveness of the alternatives.

2. *The PPB process and its data needs have been added to those of the traditional budgetary system.*—Both need simplification and ultimately some degree of integration. At present translation of program decisions to budget terms and vice versa is difficult to do on a timely basis.

3. *We need better cost estimates, particularly for new weapons systems.*

4. *There is still a great deal to learn about the measurement of effectiveness.*—This problem is particularly important in the General Purposes Forces area.

5. *Although most useful in aiding major decisions by top management, PPB has not yet been effectively integrated with management processes and systems in military headquarters, commands and installations throughout the Services.* Some progress is being made toward the integrated Resources Management System and further progress is anticipated in the period immediately ahead. Right now, the allocation and allotment of funds to particular activities is a crazy quilt of

different appropriation accounts. Installation commanders draw their funds from a multiplicity of accounts. In many cases their own budgets are not charged with an important part of the military resources they use—such resources are free to them. And I think we are all aware of how hard it is to establish incentives to economize when resources are free. Under the new system the program decision structure can be translated into meaningful overall operating budgets for individual commands and installations. The systems can thus provide better control, and most importantly, establish incentives for operating efficiency.

My concentration upon some of the problems—to the exclusion of the accomplishments—of PPB in the national security area should not be taken to mean, Mr. Chairman, that I believe the problems outweigh the accomplishment. They do not, by a long shot. I have done this simply in the interest of economizing on the committee's time, since I know you are fully aware of the achievements of PPB in the Defense area.

PPB IN THE FIELD OF FOREIGN AFFAIRS

Turning to the field of foreign affairs, there is a striking parallel between the state of Defense management in 1961 and that of foreign affairs management at the present time.

Just as the size and complexity of the establishment for Defense has grown enormously in the last 30 years, so has that for foreign affairs. In 1937, we spent \$18 million on foreign affairs—all on the traditional diplomatic functions of the State Department. In 1937 we dealt with 61 countries. We now spend \$5.6 billion on foreign affairs, exclusive of expenditures on U.S. military forces and intelligence.

Instead of constituting all our spending on foreign affairs as in 1937, diplomatic functions now account for less than 4 percent. Six major agencies are involved in foreign affairs programs. The number of countries we recognize in the world has grown to 119. Of the \$5.6 billion that we will spend on foreign affairs this year, the bulk will go for overseas activities and programs—that is, for activities designed with a particular mission in mind as distinguished from the general overhead of foreign affairs. The striking fact is that our foreign affairs now have a very large resource dimension as well as the traditional one of diplomatic relations. It is in the management of these resources that there are opportunities for improvement through PPB, since PPB is designed precisely to relate budgetary resources to program objectives.

If one were to summarize the criticisms of the foreign affairs management process most often made at the present time, they might read as follows:

- Each foreign affairs agency conducts its own planning without any systematic means of *comparing its programs with those of the other agencies* designed to fulfill related missions—i.e. the scope of the planning process is not matched to that of the problems.
- Foreign affairs resource management decisions are not systematically developed and debated *in relation to the costs and the effectiveness of alternative means* of achieving national objectives.
- The *time horizon* of the budget tends to be limited to one year.

—There is no integrated foreign affairs management *information* system.

These problems seem to me to make a *prima facie* case that we need to improve our decision process in foreign affairs resource management.

In short, we need better ways to concentrate upon allocating our resources of money and people to maximize the achievement of foreign policy objectives. There are two aspects to the creation of such a system: (1) The execution of a PPB resource management system within each agency in the foreign affairs field, and (2) the institution of an *overall* system covering all agencies. Some pre-existing factors help in the extension of PPB to foreign affairs agencies.

First, there has been long-standing recognition that *individual countries constitute useful categories* under which to analyze an agency's foreign affairs activities as a means of achieving U.S. objectives. Nation states provide the basic building blocks for agency programming systems. These country units can, in turn, be combined into regional groupings and ultimately into worldwide agency programs. In other words, the *country program* is the basic building block.

Second, by 1965, *procedures for country level program planning* existed in several of the foreign affairs agencies. The principal procedure was (1) the preparation of country strategy papers in AID, (2) the Internal Security Plans for the Military Assistance Program, and (3) the annual country plans of the U.S. Information Agency. In these papers, we had the basis for the country Program Memorandum now prepared for the agency PPB systems.

Reflecting these factors, the individual agency PPB systems have developed along similar lines. The procedures common among them involve three steps.

—Initially, *country Program Memoranda* are prepared by each of the agency's major overseas posts and are reviewed by the U.S. Ambassador—although his involvement in the process varies widely.

—Next, the country Program Memoranda are reviewed by the agency's regional offices in Washington, which may use them to prepare regional summary Program Memoranda.

—Finally, the country Memoranda and regional summaries provide the basis for the agency's worldwide Program Memorandum (and its Program and Financial Plan) which accompany the annual agency budget submission.

At present, this system applies in four major agencies:

1. The State Department is preparing country and regional program memoranda only for its *educational and cultural exchange programs*. Because of the difficulties of allocating its salaries and expenses in the complex area of diplomatic activity, it is concentrating the remainder of its PPB efforts on special analytic studies of Department-wide management problems and on steps toward overall foreign affairs programming.

2. In *AID*, PPB has meant a reorientation of existing program documents to specify objectives and to define the relationship of programs to those objectives more clearly. This year the agency will develop country Program Memoranda covering nearly all of its country programs.

3. The *U.S. Information Agency* has made notable progress in preparing 38 country Program Memoranda this year. They show, for the first time, the total costs of the various media activities in each individual country and evaluate the effectiveness of the total program in terms of U.S. objectives and target groups. While a direct relationship between given media products and specific changes in attitudes and behavior abroad may always be impossible to determine, USIA has found that much analysis useful to decision-makers can be undertaken short of this ideal.

I might note that we have a model country memorandum which was prepared for a specific country by USIA, and which I think is a good example of the application of specific analytical techniques to a very difficult area. We have eliminated specific country references and entitled it "EREWHON" instead of a specific country.

4. This year, the *Peace Corps* is preparing Program Memoranda for more than fifty countries. Its overseas Country Directors have been asked to examine current and proposed projects in terms of critical host country needs and to develop country strategies based on this analysis. Project goals are being more clearly defined as a first step toward improved qualitative and quantitative performance measurement.

In addition we are using the PPB process to link P.L. 480 food assistance and the economic assistance programs of AID. Both provide resources to the developing nations. Both should be related, particularly in terms of improving agricultural production in the recipient nation. This year, AID and the Department of Agriculture will collaborate in the overall analysis of P.L. 480 requirements and supplies. In addition, the AID country Program Memoranda will carry a section on P.L. 480, worked out in collaboration with the Department of Agriculture.

Although progress has been uneven within the foreign affairs agencies, we anticipate a steady improvement in the contribution of PPB to agency decision-making.

Perhaps the most significant opportunity to improve our decision process in foreign affairs operations lies *in the use of agency PPB materials to establish an overall foreign affairs programming system, and to provide the Secretary of State and the Regional Assistant Secretaries with a procedure to coordinate resource management in U.S. foreign affairs.*

In other words, the parallel development of agency programming systems, on a country and regional basis, can be one important means for assisting the Secretary of State and his principal subordinates to carry out the charge given them by the President last year "to assume responsibility . . . for the overall direction, coordination, and supervision of interdepartmental activities of the United States Government overseas."

Because of the complexity of problems of foreign affairs programming, we will not develop an overall programming system quickly. PPB itself is still new and its full outlines have not yet been completely determined within the agencies. But the country and regional program systems which have now been developed by individual foreign affairs agencies under PPB, can fruitfully be used to form the base of an *overall* foreign affairs programming system. As a start in the development of such an overall system, the Budget Bureau and the State Department are this year jointly taking two limited steps.

First, during our formal budget review this fall, we will systematically consult with the State Department's Regional Assistant Secretaries on interagency program issues. The basis for our budget review, and for these consultations, will be the individual country and regional Program Memoranda of the foreign affairs agencies.

Second, we hope to develop jointly with the State Department several *overall country Program Memoranda*, as models (perhaps one country in each major region will be selected). These papers will cover the resources of the major foreign affairs agencies in the countries chosen, and concentrate particularly upon *inter-agency relationships* and issues.

Let me stress that these are tentative steps looking toward a more intensive effort next year.

As we press ahead with the development of a foreign affairs resource programming system, I am fully aware of some very difficult problems which we face. The problems are similar in form to those encountered in DOD and the domestic agencies, but they may be more intractable in foreign affairs.

First, there is the *twofold problem of determining U.S. policy goals in a rapidly changing world and of defining them in terms of programs*. The constant evolution of the country situations in which our programs are set requires a periodic re-evaluation and, where appropriate, a precise restatement of our goals—a difficult task. To some extent the fact that we are starting from the bottom up—using the country Program Memoranda of various overseas agencies as our building blocks—may be a very real help. Ideally, to follow the logic of the system, PPB would start from the top down—i.e., it would call for a clear statement of U.S. objectives in each country and the development of individual programs to meet those objectives. In the foreign affairs field, however, this might lead to sterile exercises in abstractions. By starting with solid analyses of existing programs in particular countries, and trying to understand the interrelationships and consequences of those programs, we may be able, at the same time, to develop a clearer picture of our goals and objectives.

Second, there are *problems in determining program output*. These problems stem in part from the objectives problem, but also from the frequently intangible nature of foreign affairs activities. We can account for the resources that go into our foreign affairs activities much more easily than we can measure what is achieved in a return. In many cases what is achieved in return is simply the avoidance of something worse than we now have.

A particularly thorny aspect of the problem of defining both goals and outputs is the large number of issues in which *U.S. program activities can only marginally affect outcomes*.

These situations are frequently encountered in economic and food aid, MAP and the Peace Corps. The resources being programmed are but a fraction, added to the inputs of the host country, our allies and other countries, and multilateral organizations. That fraction is often crucial. But it is hard to isolate its contribution from that of others.

Moreover, our capital and food loans are intended to support (and are often conditioned on) *policy reforms (self-help)* in other countries, which have more direct influence on economic development than our transferred resources. Thus, *the critical intermediate link of policy*

reform lies in the use of our resources to encourage improved performance on the part of the host country. The *specific* contribution of our resources may be less important than the leverage they provide for that overall improvement.

Third, there is a substantial *interdepartmental problem*. This subcommittee is well aware that while the Secretary of State directly controls the Department of State and the Foreign Service, he has varying degrees of policy control over the other instruments of foreign affairs. Operational control remains largely the immediate responsibility of the independent agency heads. As I said earlier, the development of foreign affairs programming may well be a promising device—albeit not the only one—to help the Secretary extend and make more effective his leadership of the foreign affairs community.

One of the frustrating aspects of interagency coordination is the quite human fact that no one likes to make a decision—or in a debate give up his position—until he absolutely has to. Interagency coordination through Task Forces or Committees (e.g., the SIG or IRG that were set up last year) can work well when *specific issues* are up for *decision*. Unfortunately, however, planning usually relates to future actions and not to today's decisions. Hence, interagency coordination often works well when today's fires have to be put out, and not so well at planning how to avoid tomorrow's fires. The beauty of PPB as a device for coordination of planning, is that it relates to *budgetary decisions*. Plans for the use of resources next year must—by the inexorable deadline of getting a budget into print—be brought to a decision point. In other words, since PPB feeds into the budget process, it is a device for converting a planning exercise into a decision process. As such, I believe it can be a most convenient process to help the State Department exercise leadership in interdepartmental matters relating to foreign affairs.

SCOPE OF INFORMATION PROVIDED BY PPB?

Senator JACKSON. Thank you, Mr. Schultze, for a fine statement. I believe you have laid the groundwork for a good, healthy discussion. I have a few questions and then I want to turn to my colleagues.

Charles Hitch, who as Comptroller of the Defense Department had the primary responsibility for fashioning and directing the planning, programming, and budgeting (PPB) process, summarized his view of the Defense system in these words, and I quote:

“ . . . we have provided for the Secretary of Defense and his principal military and civilian advisors a system which brings together at one place and at one time all of the relevant information that they need to make sound decisions on the forward program and to control the execution of that program.”

The implication of this statement is that “all of the relevant information” needed to make sound decisions can properly be reflected in the form of program budgeting and cost benefit analyses, or cost-effectiveness studies. I would appreciate having your comment on this.

Mr. SCHULTZE. I think that I would make three points with respect to it. First, I think you will notice from the way the quote is phrased that it isn't the system that makes the decision. The system brings to

bear the information needed for somebody to exercise judgment on a decision. That is point number one. He is not claiming that the system makes decisions but that it makes judgment more reasonable.

Secondly, I probably would quarrel with the words "all relevant information" simply in the sense that we never have all of the relevant information to make any decision. One of the secrets of decision-making and the exercise of judgment is to be aware of that fact.

Senator JACKSON. To say "all of the relevant information" is to make a crucial assumption.

Mr. SCHULTZE. I quarrel with it in perhaps a slightly different tone or shade of meaning than you do. I quarrel with it in the sense that almost all decisions in the federal government are decisions where you don't have and you can't have all of the relevant information. That is clear.

It is not that the kind of information you can get won't fit in a cost-effectiveness framework. I believe that you can put into a cost-effectiveness PPB framework all of the information you can get (although not all of it can be expressed quantitatively). But you will never be able to get your hands on all of the information you really need to make a decision in an ideal sense.

If you think of cost-effectiveness analysis as different from and broader than quantitative analysis, if you regard it as a logical, systematic way to lay out the problem, then I would agree with Mr. Hitch that in that sense the relevant information can be brought together. You don't need a second system or something else to do it.

Senator JACKSON. Let me follow up on that. I think the overstating and overplaying of what the PPB system can do has a lot to do with the uneasiness about it up here in Congress. It may also help explain why you have the problem you mention in your statement, of convincing harassed and skeptical agency officials of the utility of PPB in their operation.

Would PPB give the Secretary of Defense all of the information that he needs regarding the political benefits and costs in terms of domestic support for a particular decision—for example, what support there would be in Congress? And would the PPB system in Defense give the Secretary all of the information that he needs on political considerations abroad, as in the case of the cancellation of Skybolt?

Mr. SCHULTZE. There are two parts to that question. One, can, does, or should—use whatever verb you want—the PPB process give him all of the information he needs about the political problem at home? No. So I really ought to amend my prior statement. You are quite correct.

Senator HARRIS. You mean political problems abroad?

Senator JACKSON. My question related to information on political factors and considerations at home and also abroad.

Senator MUSKIE. Do those factors and considerations come into the picture at all?

Mr. SCHULTZE. I agree that they can and do and should. I agree that PPB is not a mechanism to bring in the political information at home. In the first place, the people doing PPB were not selected for their ability to make substantive political judgments, and this is clearly one of the things that enters into the judgmental process of the Secretary and his principal appointed subordinates. So I would agree that PPB can't do it and probably should not try.

Secondly, with respect to political considerations abroad, political in the sense of our foreign relations, it seems to me that the decision process should be structured so as to kick up to the man who has to make the decision, the implications of our relationships with other countries.

This is clearly a piece of the analysis which can be done. It doesn't mean the analysis tells you what you should do, but it ought to lay out the costs and possible consequences.

Now, you can have a very good substantive analysis, but if the person making the final judgment does not himself think of or have laid out for him some of the costs and consequences—then you have a Skybolt case. You will not get good decisions if these considerations are left out, and you cannot expect any decision-maker to think of every factor by himself. So I would claim that somewhere in the process these factors have to be gotten up to the decision-maker. Of course, no analysis of the substantive problem can prevent you from making a diplomatic gaff if the results are not handled with some care. But it does not seem to me that this leads to the conclusion that PPB is somehow deficient or biased. It simply means that you have to put a means for getting these considerations into the process.

Senator MUSKIE. Would you yield there? It seems to me that PPB is primarily a resource management tool, or budgetary tool. I would like to ask this question based upon that understanding.

There are some important decisions which will have minimal budgetary impact and yet may have to be weighed or balanced. These are in contrast to decisions which have larger budgetary and resource impact. Does the PPB system provide for giving appropriate weight and consideration to decisions of that nature or are you going to be caught up constantly in relating the importance of decisions to the budgetary or resource impact?

Mr. SCHULTZE. Let me try my hand at that. Let me make a distinction which I didn't do clearly enough in my statement between PPB as a system for decision and PPB as systematic analysis. Let us take the case of a decision which involves foreign affairs considerations, such as Skybolt.

PPB is a system for handling and managing budget resources. In itself, it is not now set up and probably can't well be set up to handle the foreign relations aspect of the problem. But that doesn't mean that the system for decision-making of the Secretary of Defense and Secretary of State shouldn't have built into it a means to get an analysis of the foreign affairs implications.

In cases like that of Skybolt, or similar cases, International Security Affairs at the Pentagon should be and are involved in the decision process. The Secretary of Defense receives analytical statements of the problems through PPB. But PPB as a resource management system in and of itself probably doesn't and probably can't handle this completely.

To pull another case out of the air, suppose the question is whether we should recognize Biafra. This is not something that is fundamentally a budgetary decision process, even though its very long run indirect consequences may involve large budgetary problems. That isn't something that you can crank in through PPB.

Senator MUSKIE. So what you are saying is that in the same sense that PPB is broader than the old-fashioned budgetary process, decision-making is going to be much broader than PPB.

Mr. SCHULTZE. I agree. When I agree with you on that, I don't mean to say, however, that merely because there are aspects of decision-making which PPB can't handle, that substantive analysis shouldn't be addressed to those issues. In a case like Skybolt, for example, when an analysis comes up through the PPB process the foreign relations alternatives and the possibilities and probabilities should also be staffed out and the decision-maker should then exercise his judgment on both sets of analyses.

I think you can subject to analysis the non-resource management aspects of a decision, at least in the sense of laying out the kind of things you want to exercise your judgment on. This strengthens judgment rather than lets it grope in the dark.

RISKS IN PPB PROCESS

Senator JACKSON. Mr. Schultze, it seems to me that there is a real danger of a foul-up here, because the PPB process brings to the top official such a neat, quantified package that, under the pressures of other business, he may "go" for it, and there may not be the sense of inquiry that one should have in trying to ask the kind of hard, tough, questions that ought to be asked about what lies ahead down the road.

So this leads me to the question: Is there any procedure by which you try to insure that the political and diplomatic consequences of a decision on a given weapons system, as in the case of Skybolt, are brought into the analysis? Is there a procedure?

Mr. SCHULTZE. Sticking for the moment to the Defense Department, let me back up and give a little background. Let me broaden your question or implied criticism—the general criticism that the whole PPB process in the Pentagon stifles dissent and bargaining, because the issues come up in a "neat" package.

If you look back 10 years at the way the budget process developed in the Pentagon, PPB has stimulated a very great deal of dissent and bargaining that never existed before. As an over-simplified way of explaining the process, a number of years ago the Secretary would lay down a budget ceiling, and the argument would really be about whether or not the Services and the JCS could crack that ceiling, rather than about the specific program consequences of recommendations.

It seems to me that by establishing budgets on the basis of programs, rather than laying down an arbitrary ceiling and fighting about whether or not you can bust through the ceiling, you lay the groundwork for substantially more—not less—dissent and bargaining about really substantive matters.

The Presidential Memoranda on program issues, as they are called in the Pentagon, are a device for laying out alternatives, and the Secretary's initial decisions.

They are sent back to the Joint Chiefs and the Services for comment, debate and dissent, but they go back in terms of the program and its budget consequences, program by program, rather than in the form of a debate about a flat budgetary ceiling.

This doesn't mean that the decisions finally made are right in all cases. Of course not. I am not saying that. But the debate ought to be about the alternatives. What are some of the problems? These are not simple decisions which are made and then come in to the President.

There are, rather, a number of drafts of the Presidential Memoranda, and the whole point of the draft is to allow it to be circulated in the Pentagon to the Joint Chiefs and to the Service Secretaries, precisely to draw out the kinds of dissents on which judgment is required.

Finally, I would quarrel a bit with your description of their coming up as a neat package. As a matter of fact, they are not really neat packages, because in most cases alternatives are laid out. Memoranda don't go A, B, C, D and therefore the conclusion. They go off on side tangents. They bring in some of the alternatives. I won't say this is done perfectly, by any means, but they are a device to get the issues up.

One of the things which has happened is that a good bit of this analysis is not done at the Secretary level but by the individual Services. Because the Secretary has a staff that can raise tough questions, this in turn has generated a lot of good analyses designed, quite frankly, for defensive use by the Joint Chiefs and the Services.

You tend to get a much better debate about the substantive issues through this, I think.

Senator JACKSON. PPB, I believe, has meant a greater centralization of decision-making and control in Defense. A consequence is that it is easier for OSD to ignore or just not to hear arguments or points of view it would rather not hear.

Do you really feel there is full and frank interrogation and inquiry from the bottom right on up and at the highest level?

Mr. SCHULTZE. Clearly in the sense of the Joint Chiefs and their staff, and the Service Secretaries and their staffs, yes. I have seen it and I have watched it. It is not that I feel; I know.

I am not trying to say that every decision that is then made is correct, because when there is dissent someone has to make a decision and you may agree or disagree with the decision, but the mechanism for dissenting is not just in terms of "The budget ceiling is too tight to live with", but rather a dissent in terms of the substantive issues.

Senator JACKSON. Obviously, good analyses, if carefully prepared by people knowledgeable in the field under consideration, can be of value as tools of interrogation. They can contribute to the process of trying to come up with the right decision. There is always the danger, and I am sure you would agree, that some people begin to interpret PPB as an end in itself and as itself providing the wise decisions.

It can become, if I may put it this way, a dangerous instrumentality in the hands of someone who is not using the instrumentality properly.

Mr. SCHULTZE. Let me put it this way: If you hack around blindly with a sharp knife, you are going to cut yourself. The answer isn't to abolish sharp knives. But I will agree that a really bright man with a good technique for getting at substantive issues can do damage, if he doesn't use his ability properly. But this is not a criticism of the system. The system does tend to flush out issues and, like any system, it can be abused. I am saying that on balance, it opens up dissent and controversy in relevant areas. This is better than the continual round of everybody repeating what they said last week.

The system isn't to make decisions. It doesn't make decisions. As a practical matter, as I indicated earlier, in the JCS and the Services they have built up their own analytic staffs to a point where they are quite capable of arguing with the Secretary on his own grounds.

HOW DOES STATE GET IN ON THIS SYSTEM?

Senator JACKSON. We have used Skybolt as an illustration. We might have used some other weapons system, such as ABM. How do you get the State Department in early on this process so that foreign policy considerations are properly taken into account before the damage may be done?

Take, for example, the problem of the level of conventional forces in NATO, the size of the American contribution and how to pay for it. The political implications of decisions on this range of questions are tremendous. How early in Pentagon planning on these issues were the political implications and the diplomatic considerations fed into the analyses? It is one thing for the planners and OSD to come up with a neat package showing what cutback and payment scheme would meet their calculus of the military requirements. The failure appears in ignoring or completely misjudging what the political impact might be on our staunch friends in Europe, and especially the West German Government.

Mr. SCHULTZE. I don't have an answer but I think I can narrow down the problem.

In the first place, the draft Presidential Memoranda that we are talking about, in which all of these substantive issues are discussed, go to the State Department for comment so that any time the State Department wants to make an input into the process at whatever level it wants, it can do so.

Secondly, this is aided by the fact that the International Security Affairs staff at the Pentagon deals on a day-to-day basis with the State Department. You may recall, and I can't give you the exact citation, that in some of the earlier studies of this committee you pointed out that under one particular Secretary of Defense—and this went on for a long period of time—it was literally forbidden for anybody but the Secretary of Defense to talk to the State Department. That is changed substantially. The State Department does have an opportunity because it gets these draft Presidential Memoranda in plenty of time.

In turn, my frank belief is that it is very difficult for the State Department itself to have a major input into this process unless it has the staff capability at the Secretarial level to participate in the process in depth. An increase in the central staff capability of the State Department may be necessary to enable it to handle the analysis of problems in these draft Presidential Memoranda.

The system itself provides for State Department input at whatever levels seem to be necessary. It depends in part on the State Department. If it is to make that input forcefully and intelligently the State Department can't rely solely on the intuitive judgment of two or three people; it has to rely on a more substantial analytic staff.

Senator JACKSON. The PPB process in Defense is controlled by DOD. If you don't get in early on this system you may not get in in time. Yet the State Department, I am sure, would find it very difficult to know where and when to put in the inputs, without substantial staff.

Mr. SCHULTZE. I would disagree, in part at least, because on many issues I know that decisions have gone counter to the analytic staff recommendations at the Pentagon because the State Department had substantial political difficulties with them.

There are a number of cases where this was so. The resources were allocated to a particular program in opposition to the substantive analysis that might come up out of the Pentagon staff because the State Department felt that we couldn't afford to change certain programs because of our political problems. It doesn't mean that their decisions are right or wrong. I suspect there are more cases where the State Department position has prevailed against the Defense Department's conclusions than the other way around.

QUALIFICATIONS OF SYSTEMS ANALYSIS STAFFS

Senator JACKSON. I am going to follow a line of questioning for a moment that may not make the economists in this room too happy! There are several here, I understand.

Mr. SCHULTZE. I used to be one.

Senator JACKSON. You are trying to back out before I ask the question!

PPB has obviously enhanced the role of the economists in the decision-making process, especially economists with a heavy mathematics background and recent graduates of business schools. Obviously, also, economists do not necessarily have the experience and qualifications in the field of endeavor in which particular decisions are to be made, say weapons for guerrilla fighting, or force requirements to support the military and diplomatic role of NATO, or negotiations with the Soviet Union. Yet, as the PPB system seems to work, PPB economists are in a position to exert a major influence on the decisions to be made, since they are the ones who select and *prepare* the information to be considered in the PPB process. It is these very individuals who then pass on what information is to be included in the analyses, and what weight is to be given the various factors in the analyses.

I see a very real danger that systems analysis staffs, some of them only a year or two out of business schools, I might add, who are clearly not equipped to exercise wisdom, intuition or judgment based on experience in the relevant field of endeavor, will have too much influence over key decisions.

In some areas of national security this can mean a disaster of major proportions. Frankly, I think that this is another root of much of the doubt and skepticism about PPB on the Hill. I would also think responsible Cabinet officers, particularly a Secretary of State, would be very wary.

Would you like to comment on that?

Mr. SCHULTZE. I don't know whether to answer "yes" or "no".

First, let me suggest a modification of the question. It isn't so much economists. Rather, it is people whose background and training is in a formal analytic approach. I might distinguish, without meaning to be invidious at all, economists, engineers, and mathematicians from historians. This would be two ends of the spectrum.

As a general proposition, I think it is true that the PPB process tends to attract the former type. The people who attempt to pin things down and use analytical processes as opposed to the intuitional approach. This is a broad over-simplification. That, it seems to me, is the problem, really. It isn't so much economists. If you look at our staff or the staff of Alain Enthoven in Systems Analysis, you

will find people with all kinds of backgrounds. Law, for example, is very good training for this. Lawyers tend to make good PPB analysts. Do you get a bias in the system on that account? My answer to that, I think, is "no".

I think as an answer to a former question, that the process is set up to encourage dissent, questioning—in other words, the analyses do go down to those with different bargaining stances for comment and counteranalysis. PPB still operates in an advocacy situation. It isn't that the whole thing is monolithic; if it were, you would have a legitimate complaint.

If the process were set up in a non-advocate, non-bargaining situation, there would be a problem. But in everything I have observed the bargaining is still there. The question is, I think, whether or not this analytical approach contributes to the bargaining. I think it does, but whether it does or not the key point is that the bargaining is still there, and everybody has the chance to have a crack at the question.

In the civilian agencies it is even more true. I do not think—as I said, it is about 27th on my list of fears in this world—that the bargainers in this process are going to be overcome by statisticians and economists and mathematicians. I don't think so, so long as you keep a process in which the bargaining can play a role. Let me assure you, from my experience, it surely does.

Senator JACKSON. I think one result of the greater centralization of the decision process in Defense, whether it was so intended or not, is that voices of dissent at lower levels have considerable difficulty making themselves listened to, on many critical issues, at high DOD levels.

Also, there is the real temptation, as you know, for officials to latch onto these quantitative studies as the final word and not ask the necessary mean, hard questions. This is a danger. It is an obvious one to all of us on the Joint Atomic Energy Committee, for example, who have gone through the struggle for the nuclear-powered carrier.

DOES PPB INTRODUCE A BIAS?

Senator MUSKIE. I think the point Senator Jackson raises is a very legitimate one. Let me ask you this. Perhaps I could get a little different slant on it. In an establishment as large as the Federal Government, specifically the Executive Branch, the top decision-makers have to rely on facts which are generated by somebody.

Mr. SCHULTZE. That is right.

Senator MUSKIE. The question, then, is—and this is the question Senator Jackson raises—whether the generation of these facts is such under this system as to give it a bias which it would not have, for example, under the arrangement before this system. I am persuaded that it does generate dissent and inquiry and maybe even controversy. But even that may be shaped along specific lines. So the question is whether it is desirable to systematize the generation of facts so carefully and within such carefully defined patterns and limits.

Senator JACKSON. There is a fellow on top and he is not totally familiar with all of what has been cranked into the analysis and what has been left out. He may be told everything is in, and properly weighted, but he can't safely rely on that assurance.

Mr. SCHULTZE. You have to remember that so long as you still have the bargaining, you are going to have both parties to the advocacy process generating facts.

For example, take education. If the Budget Bureau were the only one in the process of generating analysis on education, I think you would have a point, but it isn't. The Office of Education or the National Science Foundation, dealing with these problems with a different viewpoint from the Bureau of the Budget, comes up with its analysis and its facts.

The same thing is true in the Pentagon. The Joint Chiefs are a part of this bargaining process and they come up with the facts. I am not saying the final decision-maker is necessarily going to make the right decision, but he is not relying solely on facts developed by a single staff. As long as you do get the bargaining process going, and I think that it must continue, and has to be a part of this process—as one of the checks and balances—you can get both sides doing the analyses.

Senator MUSKIE. May I make another point? Most questions have more than two sides.

Mr. SCHULTZE. That is correct.

Senator MUSKIE. So I think what we are worried about is that maybe you are limiting the number of sides that are exposed even though you can debate and have discussion. Do you get all sides?

Mr. SCHULTZE. Again, my own experience is that where there is any side in existence which has a major interest in the controversy, it has an opportunity to get in. Now, you may find that because one particular interest does not itself have much analytic capability, it is at a disadvantage.

Senator MUSKIE. Or it may not have any advocacy?

Mr. SCHULTZE. It isn't PPB which denies them a voice. You don't criticize the PPB on that account. You criticize your institutional system because it leaves somebody out who ought to be involved. For instance, if the State Department were not involved in the process, the criticism is not that you shouldn't have PPB or an analytic approach, it is rather that you ought to bring the State Department in. That is the answer to that question, to make sure that the institutional mechanism is set up to give a role to those who have a legitimate interest, or any substantive interest.

Admittedly, an agency is dependent primarily upon its own analytical staff.

I don't think that the answer to the problem of not having all of the right kind of facts or all of the right kind of analyses is "Let us scrap analysis, and let us scrap facts." I think I would worry a little more about the fact that at present the decision-makers, however good they are, are making their decisions in the dark. As a general proposition of the Government, that problem is more of a difficulty than the fact that in building a systematic analysis, without having all of the advocates in there, you may build some biases into it. While I can't deny this is a problem, it seems to me it is the lesser worry when you are disposing of \$135 billion worth of resources and making decisions affecting the security of a nation. I would much rather have a system which gives me an analysis, even though I have to be careful to make sure it isn't biased, than not to have an analysis at all.

You can look at any number of examples. It takes analysis to know that your conventional forces are highly imbalanced in that you have a certain number of divisions that you couldn't supply more than ten days in combat, and so the money you put in is wasted. That isn't immediately obvious. Someone has to look at the figures. Or possibly you find that you couldn't give them tactical air support because you are having each Service make its own decisions and these are not related to general force requirements. That isn't immediately obvious. Someone has to make an analysis.

I think the danger to the national security and the possibility of literally wasting the taxpayers' money are much more severe without analysis than the dangers which may come because an analytic system, never being perfect, may bias it.

Senator JACKSON. I agree that there is a need for good analysis. A real danger in this PPB system, however, is that the decision-maker will be tempted to buy one systems analysis or cost-effectiveness calculus as the last word.

When analysis by knowledgeable people in the subject under consideration is used as an additional tool in the judgment process, that is fine. Any man who has to exercise judgment, of course, needs all the relevant information he can get, including alternatives and other considerations.

But people can really be "snowed" by the figures, and the elaborate statistics on costs and gains—which have been weighted on the basis of the assumptions and premises of the systems analysts. Unknown, unquantifiable, contingent factors can then vitiate these premises and assumptions and completely change what the decision should have been. Some recent assumptions of Defense analysts already look quite wrong; for examples, premises with respect to nuclear-powered carriers, to the time table for the anti-ballistic missile, to our requirements for helicopters and for trained military pilots.

There is the danger of the tidy, orderly looking, quantified package.

I am all for good analysis to assist the decision-maker, and for tools that will aid him in asking the important questions and in looking well down the road ahead before he sets out on it. This is a never-ending problem.

Mr. SCHULTZE. Yet you have to remember that the problem the Federal Government faces generally is almost exactly the opposite of that. As a general proposition, the problem of the President and Cabinet heads and the Congress is that they are usually presented with "yes" or "no" decisions, and not with alternatives.

Now, your problem is the alternatives may themselves get biased. That may very well be. I can't say there won't be analyses that do bias the alternatives.

Senator JACKSON. The fellow who controls the system can manipulate it and almost rig it. In addition, I observe, he can ignore other beliefs about technological change, conflicting appraisals of costs and benefits, and so forth.

Mr. SCHULTZE. But he could with or without the analysis. If he were going to do that, couldn't he do it in any event?

Senator JACKSON. I don't think it is so much a matter of evil intent or of a premeditated desire to ignore others. I think he gets hold of

this toy and he comes to the conclusion that this is where the answers are, and all other viewpoints are for the birds.

Mr. SCHULTZE. If this were a monolithic setup, then I would fully agree with you. My key point on this is that in the Pentagon, where it is most carefully organized, it is not a monolithic setup. The whole procedure is set up to generate counteranalysis by other advocates.

That does not mean that you have to agree with the final decisions that are made.

Senator JACKSON. But the bargaining in the Pentagon is weighted in favor of OSD and its analysts. Not all the participants in the adversary-process are on a parity. There will be variations, of course, with particular problems.

Mr. SCHULTZE. I don't know exactly how to answer. There are cases where I am sure that that is true. It can happen. But I am saying in general that what the system brings to the decision-making process, is much, much more beneficial than what it may leave out, so long as the person who uses it is admittedly aware of his limitations.

There are limitations on any analytic approach, limitations in that, after all is said and done, the final decision is going to require judgment because the analysis can't determine among all of these alternatives. The analysis can't and you have to leave it to judgment.

RESPONSIBILITY OF BUDGET BUREAU

Senator JACKSON. I have here a number of additional questions on which I would appreciate your comments and answers. I suggest that you provide your responses subsequently in writing and we will include them at the conclusion of this hearing, in the body of the record.

Let me ask you one more question before I turn to Senator Mundt and the other members. Do you see it as a part of the Bureau of the Budget's job to make sure that those who should have a role in this process in fact do have such a role?

Mr. SCHULTZE. Yes, as a matter of fact—

Senator JACKSON. This is very important.

Mr. SCHULTZE. Referring to the colloquy we had a few moments ago, we have been for quite some time strong promoters of an enlarged role for the State Department in terms of the management of our foreign affairs activities and of getting them into a lot of decisions they ought to be in and are not. We want to provide them with the kind of staff work they need to do this. This is a particular case that I feel strongly about.

The same thing is true in some of the other areas of the government where we have tried to make sure, without full success, I assure you, that the appropriate people are brought into decisions where their responsibilities are affected by the actions of some other agency running a program. Manpower programs are a case in point. We are not fully successful, but we try to make sure that everybody who has a major interest in a decision gets into it.

This is costly, to some extent.

Senator JACKSON. And it can be overdone, too.

Mr. SCHULTZE. The key thing is to try to tie it to actual decisions. If you set up committees simply to talk about planning, they will go around for days on end. The whole objective here is to turn this into

a decision process. There are some areas where a question doesn't affect the budget, and you can't tie it effectively to the budget process. Generally, one advantage of using the budget process is that you have to make a decision ultimately, and this decision involves resource allocation.

Senator MUNDT. Are you the chief of staff of PPB, or have you given this assignment to someone else?

Mr. SCHULTZE. The real chief of staff is Mr. Hoffman, my Assistant Director, who is sitting here. He worries about it every day, and I may worry about it three times a week.

DEFINITION OF PPB

Senator MUNDT. I want to be sure I understand the terminology correctly. Are PPB and Secretary McNamara's cost-effectiveness synonymous?

Mr. SCHULTZE. No.

Senator MUNDT. What is their relationship?

Mr. SCHULTZE. Let me try it. PPB is really a system that starts with planning about objectives, develops programs through analysis on the basis of those objectives and translates those programs into budgetary requirements. So PPB is a system which attempts to relate policy planning on the one hand to resource use, and budgets on the other. Cost-effectiveness analysis is an analytic technique which goes into planning for the use of resources. So PPB is a system of trying to relate planning to budgets—to the allocation of resources—and cost-effectiveness is a component of it. It is an analytic technique.

For example, very often in legislative programs we propose X, Y, or Z, and later we fight about the budgetary consequence of it. The whole point of PPB is to make sure that the cost consequences and the budgetary consequences are considered together with the planning. PPB is a system for doing this.

NUMBERS OF PPB PERSONNEL

Senator MUNDT. How many people, Mr. Hoffman, are involved in the PPB process?

Mr. HOFFMAN. Within the entire government, you mean?

Senator MUNDT. Yes.

Mr. HOFFMAN. About 800, or somewhat over 800 as of 1968. It depends on Congressional action.

Senator MUNDT. How many do you have in the Budget Bureau?

Mr. SCHULTZE. There are two parts to this. One is that we have Budget Examiners organized by program divisions in the Budget Bureau. My objective is to make every one of them understand and worry about and carry on their work through analytic techniques. So in a sense all of my Budget Examiners are in this. However, as to the system itself, Mr. Hoffman has a small staff in the Budget Bureau which is responsible for insuring that the rest of the Budget Bureau follows this technique, and that staff has only 12 slots. That doesn't mean that the Bureau has only 12 people on it.

Throughout the Government as a whole there are 800.

Senator MUNDT. Are you saying if there was no such system as PPB, there would be 800 less federal employees?

Mr. HOFFMAN. No, sir, a number of those jobs are redefinitions of previous activities or redirection of previous activities into new channels.

Senator MUNDT. That would have been my assumption but I was asking the question. You do have to have some extra personnel to operate a new system. I am trying to find out how many people. I was shocked when you said 800. I am happy to have you make that correction.

Mr. SCHULTZE. How many additional are there?

Mr. HOFFMAN. We had that number, and I don't have that with me, but my impression is that it is about 40 percent of the 800. I can get you the precise figures.

Senator MUNDT. I thought the system would just kick out information like this awfully fast, and you could turn to a computer card and tell us how much it would cost. I wanted to test the system.

I don't want to embarrass you, but if you can get the answers to both questions I wish you would put them in the record.

Mr. SCHULTZE. Part of the difficulty in answering the question, Senator, is that this is a part of the reorganization of people who are already on board, and it is awfully hard to tell precisely who would have been on board if you didn't have this system, but we will do our best with it.

(Mr. Schultze subsequently supplied the following statement:)

There will be 869 PPB positions in FY 1968 for the twenty-one major civilian executive departments and agencies to which PPB has already been applied. This number is based on the assumption that where legislative action is incomplete it will follow Committee reports, or, where Committee reports have not yet been issued, it will follow the budget requests. Of the 869, about 45%, or 390 positions, are a net increase due to PPB (139 of these are new requests for FY 1968). The remainder are positions that existed before PPB. In some cases the positions have simply been redesignated as a PPB position; in other cases the functions have been redirected to accord with PPB procedures.

Senator MUNDT. Is PPB about two years old?

Mr. SCHULTZE. In the civilian agencies, that is correct.

OPERATION OF PPB IN DEFENSE

Senator MUNDT. When you replied to one of the Chairman's questions relating to the Department of Defense you said that prior to the PPB system the debate and the argument was always about ceilings, or financial ceilings, and that now instead it deals with other matters, by which I assume you would mean that the debate involves weapons systems, and so on.

Mr. SCHULTZE. There is a closer relationship, yes.

Senator MUNDT. Doesn't that have a tendency to transfer the decision-making in terms of weapons systems and defense functions from the Joint Chiefs and their associates to the civilian component in the Defense Department?

Mr. SCHULTZE. I would say this, Senator, that in one sense "yes". I don't like the word transfer, but let me accept it for the moment.

Senator MUNDT. Well, there is a shift to the civilian component.

Mr. SCHULTZE. Well, yes, in that the final decisions of the Secretary of Defense on his budget recommendations to the President are going to be determined more in the context of the discussion of specific weapons systems than on the level of the Budget *per se*.

Senator MUNDT. This shift is one of the concerns manifest on the Hill, and specifically in the Appropriations Committee.

There is a feeling that in many areas, or at least in some areas, the dollar figure that we get is based on a functional determination by the civilian component of the Department of Defense. We fear this, rightfully or wrongfully; we are motivated by our fears and therefore appropriate the money. When it comes to a matter of nuclear versus turbine ships, B-52 bombers and similar issues, you can see what happens.

It is caused by a feeling that the uniformed services in their debates are not debating just for dollars, but they are debating for the right to have the kind of weapons systems they think are important and will work. We have a skepticism of civilian-trained people, questioning whether they are the best authorities in those areas.

Mr. SCHULTZE. Can I make a couple of points with respect to that? One, in our system of government the civilian President, and under him the Secretary of Defense, is ultimately responsible for making these final decisions. I don't think anyone would quarrel with that. It has always been that way.

Secondly, it seems to me it is much preferable to have these civilians make their decisions with respect to budget recommendations in terms of the national security consequences of the recommendations rather than in terms of simply setting a budget ceiling and telling everybody, "Well, you figure out the best you can do under the budget ceiling."

There are two reasons for this, I would say: One, that I myself do not believe that in this area we should set a budget ceiling and then say "you do the best you can." This is not the way to make defense policy. You don't know what you are losing or gaining.

Secondly, this is even more true when you are dealing in the modern defense systems, where objectives and weapons systems must cross Service lines.

If you give budget ceilings to each Service, you find that by going in different directions they are planning for different wars, and they are planning for inconsistent kinds of arrangements.

For example, we found we were faced with a ground forces structure quite inconsistent with that for tactical air, but clearly tactical air and ground forces have to be closely combined in operations. And I don't think you can make legitimate budgetary decisions except in the context of what this does for the national security.

There is, for example, one case I think of that indicates this clearly. I have forgotten which fiscal year it was, but there was an argument between the Budget Director and the Secretary of Defense as to what the ceiling ought to be, and the Budget was printed with the Budget Director's total at the bottom and the individual items adding up to \$1.750 billion more than that, and one line, "unallocated change in defense estimates, minus \$1.750 billion" was inserted to get the total down to the Budget Director's ceiling. I don't think that that is the way to go about it.

Now, let me add, the Congress obviously has the prerogative of and the responsibility for examining and evaluating specific decisions which come out of the process. They may think, on a specific decision that the view of the Joint Chiefs is substantively better than the final decision made by the Secretary and accepted by the President. I don't argue about that.

But it seems to me that the criticism ought to be of the specific decisions and not of the fact that the President and the Secretary are making those decisions in the context of the relation of the budget to what we are getting in terms of weapons systems and national security.

Senator MUNDT. There isn't any question you need something like PPB, and maybe the cost-effectiveness system, to keep things in balance. What disturbs me is that there seems to be an acceleration of the kind of disagreements with which we here in Congress are confronted. They now tend to deal with the types of weapons systems and the types of defense systems rather than the funds involved. The PPB system seems to generate disagreements rather than a common position—disagreements as to whether you should have an anti-ballistic system, and B-52s or no B-52s, or a Navy type plane or an Air Force type plane, or an F-111 or not an F-111.

These are the things that get down to the guts of our national safety. We are all trying to do the best job we can. It seems to me that the new system is producing arguments in new areas. We used to face the question, "How much should we spend for a weapons system?" Defense had a united front and asked for a certain amount of money. Now we have to make decisions without the benefit of computer systems on which defense systems and techniques we should have. Don't you think this problem has been accelerated?

Mr. SCHULTZE. I haven't been around here long enough to know that it is accelerated, but I will comment. The paradoxical thing about it is that the system doesn't stifle dissent.

Senator MUNDT. I am sure that that is right.

Mr. SCHULTZE. That is point number one.

Senator MUNDT. The system is tough on the dissenters though.

Senator JACKSON. Also, sometimes the dissent can only make itself heard too late.

Mr. SCHULTZE. The dissent is clearly there, and it is intriguing to me that the dissent is about the substantive questions—not "should we have so much money for the Army," but "should we build an ABM system or not." I would much rather talk about that than talk about some dollar level for the Army with only a fuzzy idea of what the difference is. It seems to me this gets the disagreements into precisely the right arena.

Senator MUNDT. It is in the wrong arena at our end of the Avenue, because we are not the experts in defense, and we are not the economists and the engineers. We are here trying to make overall policy and to do what we can to keep the budget relatively sound. It is very difficult if a part of your team says you need B-52 bombers, otherwise in the early 70's you will have no bombers at all, and other officials say, "Don't worry about that, just let the B-52 bombers go, and don't put any money in." That shouldn't be the kind of decision we have to make.

Mr. SCHULTZE. You would rather have it that way, fundamentally, than have the President and the Secretary of Defense tell the individual Services, "You get so much money and you spend it the way you want." That puts them in a terrible position, because somebody can always tell them, "If you want an ABM, take it within the total dollar ceiling."

It seems to me that this is an irresponsible approach. So while PPB may make it tougher, it seems to me it is a lot better to have the debate over the substantive question carried on this way than to have it submerged. No one can carry on an abstract debate about a dollar level, about whether the Army budget ought to be \$15 billion or \$20 billion.

Senator MUSKIE. We had that kind of a debate on the Senate Floor yesterday.

Mr. SCHULTZE. I dug myself a hole, but I think it is still not a good way to debate it. Under this system, look what has happened to our defense capability. It may not be enough, but you compare the last six years, before Vietnam, in terms of the number of combat-ready Army divisions. It is up 45 percent. The number of maneuver battalions in addition is up 40 percent. The number of active Army aviation units is up 64 percent. Airlift capability is up 100 percent. Naval ship construction is up 100 percent. Combat helicopters is up 45 percent. Number of nuclear warheads on strategic alert is up 200 percent. Number of weapons in Europe is up 67 percent.

So the Services may well say there are a number of areas where we haven't done enough, but you must remember that this PPB system—as I keep telling my people—has led to a substantial increase in budgets and in forces in being.

I would hate to think of what would have happened if we had had the kind of thing which happened in Vietnam, if we had not had the kind of buildup which was made. If you look at the forces now as compared to the Soviets, maybe the Services think that there ought to be a lot more, but when you look at the numbers—I can recite them for you if you want.

Senator MUNDT. I think that you are using the wrong criteria. You are talking about numbers of different things. The question is: how does what we are doing compare with what our potential adversaries are doing?

The present system doesn't come up with the answer that satisfies us in terms of the functional comparison with our adversaries. Take, for example, submarines, where the Russians are concentrating. This is their Navy, you might say. What are we doing to meet that particular problem? Our Appropriations Committee feels not nearly enough—that we are ignoring that particular problem. It is true we are building this and building that, and getting numbers, but for the wrong kind of war against the wrong kind of enemy.

These are decisions we shouldn't make, really. We feel that there are too many arguments down there that you fellows, with the system you are using, haven't resolved.

IS PPB A TRUE SYSTEM?

Senator BAKER. I am going to have to leave in a few minutes. If I could put in three or four quick queries along the lines that appeal to me in this context, the first is this:

The whole PPB system, it seems to me, is essentially, as you point out, a system, but you haven't yet described it as a closed system. I have not ascertained whether there is an effective feedback on cause and effect performance into the system itself which in turn would make it a closed system. Is there such a feedback?

Mr. SCHULTZE. I guess the honest answer in general is "no."

Senator BAKER. I am not criticizing you for that, because I will say, parenthetically, that a system like this is vital if we are going to have the mass of facts on which we must make executive-legislative judgments.

Mr. SCHULTZE. I fully agree.

Senator BAKER. Now, second, it seems to me that you have not described within the system a capacity for interrogation and response, for the elaboration of a particular theory or dissent or particular idea, whether at the Presidential level or the Congressional level, or some other level, in order to prevent a black versus white confrontation, a "yes" or "no" polarity that may or may not yield the proper answer. Is there an interrogation and response capability in the system?

Mr. SCHULTZE. Yes. Should I describe it?

Senator BAKER. Yes.

Mr. SCHULTZE. Yes, there is. I think the best way is to give an example to describe the process. You may recall I indicated that the essence of the system in terms of its form and not its substantive content, is a submission to the Budget Bureau of a Program Memorandum on each major category. First, the issues covered in those Program Memoranda are discussed in advance by the agency and the Budget Bureau before the agency begins to draft the documents.

Secondly, they are worked on by the agency, showing alternatives, submitted in draft to the Bureau, and the Budget Bureau in turn analyzes them and returns them to the agency with discussion on points of disagreement, with an attempt to come to agreement on excluding some irrelevant alternatives, and the agency then in turn comes back with revised Program Memoranda and with its formal budget submission based on the Program Memoranda.

I am describing this as it should work; it isn't always this neat.

In turn, any issue that the agency head feels ought to be taken to the President is taken to him. Next, whether there is disagreement or not, any issue of major importance is taken to the President even though the Budget Bureau and the agency have agreed on it. So there is a back and forth all during the process between the Bureau on the one hand and the agency on the other, and even within the agency there are back and forths. There is a system to interrogate in front of the President on issues where no agreement can be reached.

AN INFORMATION SYSTEM FOR CONGRESS?

Senator BAKER. The third point, and this is why I interrupted Senator Mundt, for which I apologize, is this: It seems to me, whether motivated by jealousy or the desire to have a maximum amount of information on which to make judgments, we are rapidly approaching the point where a substantial body of coherent information is available to the Executive Branch but it is denied to the Legislative Branch.

It seems to me for PPB to function properly and enable us to make judgments on principal as well as collateral issues, including such matters as F-111 and the like, would require two things: First, it would require a PPB equivalent for the Legislative Branch, stocked with or programmed for the same information as the Executive system; and, second, it would require a system of interrogation with potential for varying response to give us the basis for making a judgment in passing upon the recommendations of the Executive.

Senator MUNDT. The Senate passed a bill which would provide such a facility for the Congress, but the House has never acted on it. I refer to the provisions in S. 355, The Legislative Reorganization Act of 1967.

Senator BAKER. I think there are serious problems ahead of us, maybe for as long as 20 years, in finally devising, if you will, a digital system for reducing this information to intelligible form and for unifying it so that we all speak the same language: You query the system and get a series of responses, and we query the system—and we are talking the same language. Now, you are going to have problems in feeding this to the system. The old adage that is so prevalent in the trade about “garbage in, garbage out” is just as effective in this field as most.

So you have problems for 20 years, but that doesn't invalidate the necessity for trying. It seems to me the biggest problem we have, wholly aside from the F-111 and the defense posture, and the budgetary requirements or even the concept of budgetary control, is the ability of the Congress to respond on the basis of intelligent, ample, pre-digested, factual information in order to make judgments on the proposals and recommendations of the Executive departments.

Mr. SCHULTZE. May I make three or four comments on that? Parts of this are problems that we are wrestling with all of the time. Let me give you the dilemma. I think it can be solved, but it is a dilemma.

There are two parts to the dilemma. (A), what we want for purposes of making recommendations to the Congress is as frank an evaluation of programs as we can get. This is partly your feed-back problem. It is built into the analysis. There has to be an evaluation of existing programs and it is one of the most difficult things to get. This is one of the things we are pushing on. In any event, you need a frank evaluation of organization, program and everything else involved. At the same time, human nature being what it is, if the people down the line knew that everything they put on paper was going to have to be published, I suspect we would get much more cautious and much less relevant information. That is one horn of the dilemma.

The other horn is that at the same time the Congress is clearly entitled to information. Therefore, our approach, and it may not be ideal, is to say that the documents which arise out of this process are internal to the Executive Branch, but the budget justifications and the justifications for particular legislative programs ought to incorporate as much as possible of this information.

On the one hand we want to give freedom to people to write. If everything is going to be published, this cuts down the amount of frankness you get. At the same time, we then tell the agencies, as this system develops, your budget justifications ought to come up not simply in terms of justifying typewriters and ribbons but in terms of the substantive programs. We are trying to steer a line between getting frank information on the one hand, and giving adequate information to Congress on the other.

APPLICATION OF PPB IN AID

Senator MUNDT. It seems to me that the system broke down in a case we all regret and we don't know where it broke down. This was in connection with AID. You may have followed the hearings that

Abe Ribicoff and I had on the pharmaceutical situation where enough drugs were purchased for 150 million people. It seems to me that the PPB system should catch that. There are no villains, but it is bad public policy.

Mr. SCHULTZE. If there are any villains, and I don't mean in the drug situation in particular, but in that Vietnam commercial import program, I will be frank to say that the Budget Bureau ought to share part of the blame. I will tell you why. AID could have run that commercial import program two ways. You will remember that the situation was that Vietnam was faced with a massive inflation. You could have set up an exceedingly complex control system to control every commodity going in, to minimize the black market, but you would never have gotten the commodities in. Or you could have said, "Look, our main problem is to fight inflation to keep it from destroying the country; thus we should have a fairly open system on import licenses and get the commodities in, even though it may be at the cost of somewhat more black marketing than would otherwise be the case."

I can't answer as to the specific pharmaceuticals, but I will confess that we pushed AID in the direction of deciding that the basic problem was getting commodities in to beat inflation and that they should run a quick, loose system for the first six months to get them in there, rather than have bureaucratic controls up and down the line that would avoid any possible kind of abuse. I must say that I can't answer on the drug case, but a lot of the criticism has come—

Senator MUNDT. This is the kind of place where you would think PPB would flash a warning light. Maybe you haven't been applying PPB in AID long enough.

A FUNCTIONALIZED BREAKDOWN OF INFORMATION

Let me make two suggestions of what I think PPB might do. It seems to me that you should get your budget functionalized instead of departmentalized. In the case of water pollution you have 15 or 20 different outfits operating, and in the exchange program you have 25 or 30 agencies participating.

We discussed this before. In our Appropriations Committee we don't have any way to measure how large an activity we are carrying out.

Now, isn't there some way that PPB, or the Budget Bureau, or someone else could come up with some kind of a functional approach?

Mr. SCHULTZE. Let me point out that, while I won't say the Budget is perfect, it does now carry a functionalized breakdown of the Federal budget into health, education and welfare, training, and veterans, and combines appropriations into those categories. That is number one. This is shown functionally right in the Budget now, and we have to improve it. I am not saying it is perfect.

Senator MUNDT. You have not given us a responsible head like Mr. Hoffman here, your chief of staff for PPB, to whom we can go to get answers to these overall problems, such as water pollution, but we have to go 20 different places. You don't have it functionalized in terms of operation.

Mr. SCHULTZE. There are two parts of it. One, I say we do have it functionalized right in the Budget.

Senator MUNDT. In your Budget report, you mean?

Mr. SCHULTZE. Yes, and in addition to the basic functions we have a set of special analyses which show special crosscuts for functions like research and development, for oversea spending, for public works, for grants-in-aid to state and local governments pulled out and shown in one place. What we do *not* yet have and what we are trying to build up is a very complicated system, a classification system which, when somebody wants a special classification, lets us push a computer button and come up with that special classification.

Our classifications now are many, and they do show a lot of information functionally, and a lot of special information, but we have not yet reached the point where if you wanted something very special which isn't shown we can push a button and get it out.

We are working toward it but I can't promise it to you for five years. When you start looking at the difficulty of getting the federal budget into a set of buildings blocks, so that you can cut it almost any way, it is a tremendous information system. I have a specific team working on this to try to come up with a system which will do it.

IMPROVING THE EFFECTIVENESS OF STATE

Senator MUNDT. Now, my last question is this: Some years ago, approximately \$300,000 was given to a Cleveland management consultant to study the efficiency of the State Department. They made a detailed report about one inch thick, recommending changes to make the Department operate efficiently. Everybody threw up their hands and the State Department didn't turn a wheel. Nothing was done.

I would think that within the Government PPB might try to help on this sort of thing. Do you have in mind looking at a government department and trying to figure out how it will operate more efficiently, and have an in-house reorganization? Obviously, this old study was either totally wrong or there were reforms needed in the State Department.

Mr. SCHULTZE. The basic answer to your question is yes, but we are not doing it through the PPB system. I have just established in the Budget Bureau a new office of Executive Management which will look primarily at managerial problems, not substantive analytic questions. I must confess to you that we think that the priorities for attention right now are not so much on the individual agencies but on the growing number of programs where agencies overlap and the question is how to get systems for managing programs where more than one agency is involved. So our priorities are to take a look at such things as foreign affairs management, manpower programs, and urban ghetto problems, where a number of agencies are involved, and see how to get systems to handle these multi-agency problems.

That is what we think is the top priority right now in the field of management and organization. We are not doing it in PPB.

PERSPECTIVE ON PPBS

Senator HARRIS. I have copious notes here concerning a lot of questions I was going to ask which I am confident would have shown an

unusual degree of brilliance and perceptiveness on my part, but the clear evidence of at least equal brilliance and perceptiveness on the part of our chairman and other members of this committee is the fact that they asked them before I got around to it. So I am not going to do that.

I would say this has been a very useful hearing. I think that your statements and the resultant discussion are important. I would say it is reassuring to me to hear you say quite frankly that this system is *not a perfect tool and that it is not working in the civilian agencies at the ultimate degree of effectiveness.*

Mr. SCHULTZE. It can never do that.

Senator MUSKIE. Thank you very much, Mr. Schultze. I am sure we could usefully occupy the rest of the afternoon with further probing of this system. Some of us have had an interest in this in another subcommittee of this committee. I hope the system develops along the lines you suggested as your objective. I would hope that the system does not become an end in itself. I think that this is a real danger with respect to people lower down. They can, I think, if they are like me, reach out and grab hold of the most tangible guidelines and defenses that they can find. So I am not sure it is possible to get any system which really insures that we will have judgment-making instead of automatic application of the system. So I hope you can achieve that. I think that you will. †

Then I think Senator Baker and Senator Mundt have both raised a question that troubles me a great deal, and has for a long time. That is how do we equip the Congress to use this system, that is, for its own independent judgment-making process and as a way to test the decisions that have been made by the Executive. This is really tough. We don't have the good sense to staff ourselves with the people and the tools that we ought to have, and we never have. I think if it can be done without the Executive trying to dominate the Congress that we ought to have some assistance from you people in usefully equipping ourselves to challenge you in this budget process. I think it is a "must", and I think it will, as Karl has suggested, confront us with a lot more hard decisions that we have to make, but I think that we need it.

So I hope, as you develop the system, that you develop suggestions for ways in which the Congress can take maximum advantage of it,—not to rubber-stamp the Executive but to challenge the Executive, because that is the purpose of the system. It is to surface the challenges to the highest level where consideration may be necessary.

CONGRESSIONAL AUDIT OF EXECUTIVE BRANCH PERFORMANCE

Mr. SCHULTZE. There is one point on this where we are in full agreement, that the Congress can help the Executive. Sometimes we will ask an agency for some specific studies or findings with respect to how a program works, and how many people are being trained and getting into good jobs, as opposed to how many people are being run through the program.

Sometimes we ask, and we will get back a nice piece of paper with a lot of cotton candy in it. I sometimes find when the appropriate subcommittee chairman asks, and when the subcommittee chairman has a staff which knows enough to ask exactly the right questions,

that the information is more likely to be generated than when we ask for it. So quite literally, particularly by having staff members who can work up very hard-hitting specific questions and not just general questions—it is the specificity that counts because reasonable details and specific questions produce the kind of information that you need to evaluate a program—Congress is often quite helpful to us as well as to itself. This is hard work. It can't be done by asking general questions.

Senator MUNDT. In that regard, do you have people in the Budget Bureau, as an arm of the White House, who study the hearings that are held up here and the record on these points?

Mr. SCHULTZE. I am not saying we do it 100 per cent, but we do.

Senator MUNDT. If we have a subcommittee which brings out facts pertinent to the Bureau's work, how do they get to you?

Mr. SCHULTZE. I can assure you that they get to me. A Budget Bureau Examiner who is worth his salt, is looking not only at his relationships to the agencies but at the Congressional Record and the subcommittee hearings whenever he can. He can't attend every hearing, but if you do this kind of interrogation I can assure that we will catch it.

Senator MUNDT. I wanted to make sure that this was the case.

Mr. SCHULTZE. One of the reasons it will get there is that if this is anything but a casual request, we are going to make sure we take a look at it. It is a part of our daily chores. My interest is in getting people interested enough to come up with specific program evaluations, which gets at what Senator Baker said. Here the Congress can help us, quite frankly.

Senator MUSKIE. Thank you very much.

(The additional questions and answers referred to on p. 195 follow :)

MEMORANDUM OF QUESTIONS FROM SENATOR JACKSON AND RESPONSES
BY MR. CHARLES SCHULTZE

Question 1:

Would you sum up and explain the main differences between the original Budget Bureau guidelines on PPBS set forth in your Bulletin No. 66-3, October 12, 1965, and the current Budget Bureau guidelines set forth in your Bulletin No. 68-2, July 18, 1967, and reprinted in our Subcommittee publication *Planning-Programming-Budgeting: Official Documents?*

Response:

The principal changes have to do with the way we view the Program Memoranda and the future year projections in the Program and Financial Plan.

Bulletin No. 68-2 sharpens the distinction between Program Memoranda and Special Studies. Bulletin No. 66-3 treated a PM as a comprehensive analysis of the issues in a program category, differing from a Special Study primarily in its broader scope. In conjunction with this view, we limited the number of programs for which we requested PM's.

Under Bulletin No. 68-2, the PM is to establish the agency's strategy in terms of the major agency program recommendations, to summarize the alternatives considered and to state the reason for the recommendations made, summarizing the supporting analysis. Special

Studies are, as before, to deal with particular issues and the results are to be incorporated into the PM's in the discussion of the issue.

This approach permits us to receive useful Program Memoranda even from an agency that is still in the process of building its analytic capability or from an agency with problems that are particularly difficult to analyze. The approach is in keeping with my view that PPB is a systematic and explicit approach to making decisions about resource management, an approach that includes formal analysis as an important element but one that is wider than formal analysis.

We have also changed the role and nature of the Program and Financial Plan. In Bulletin No. 66-3, we requested comprehensive five-year projections based on agency intentions. In Bulletin No. 68-2, we are requesting instead that the agencies project in the Program and Financial Plan the five-year cost and output consequences of program decisions taken to date. Where there are no such commitments, we no longer request the projection in the PFP.

We still want the PM to discuss program choices in the context of alternative future decisions as well as current decisions, however.

I have discussed the reasons for this change and its importance in my statement.

Question 2:

Would you discuss the relation between national goals and priorities and the Planning-Programming-Budgeting System? The President's original announcement of the system emphasized that it was to be related to an examination of national goals, but, as I read the current Budget Bureau guidelines, the emphasis is placed on the financial costs of alternative programs designed to implement the "missions" of the various agencies.

Is PPBS used to relate agency missions and programs to national goals and priorities? How does the Budget Bureau define "goals" and "missions" and what is the process by which "missions" are related to "goals"?

Response:

We generally would define a "goal" or an "objective" as being a statement of national purpose. An example would be "improving the quality of our environment", or "increasing the safety of air travel." An agency's "mission" is that part of the goal with which a particular agency is concerned. For example, HEW deals with air pollution, and Interior with water pollution. Manpower development is an element of our goals in the war on poverty. Labor deals with certain parts of manpower training; and OEO with centralized direction, other areas of education and job training, research, innovation, and social assistance.

The establishment of national goals is, of course, a function of the political process, but there is a great deal of variation in the specificity with which our goals are expressed initially. PPB can provide information on what it would cost, in money and in other ways, and what we would accomplish if we did adopt a particular goal. In this way it can stimulate the specification of our goals that is necessary if they are to guide program decisions. PPB can also help us to determine the most effective way of meeting a goal by analyzing the relative effectiveness of different combinations of agency programs to accomplish common objectives. In this way PPB contributes to setting priorities and, in

turn, relates choices among programs and statements of agency missions to national goals and priorities.

Question 3:

A report on *The Bureau of the Budget and the Budgetary Process* issued by this Subcommittee in 1961 said: "No one form of budget preparation and presentation is the best for all purposes . . . Ideally, the financial management system should eventually be able to produce information on costs in terms of whatever program groupings are helpful to the President, his key lieutenants, and the Congress."

I would appreciate your comments on this statement.

Response:

A budget does perform several functions. One purpose of budgeting is to be sure that nobody steals from the Government, and our accounting and auditing systems are quite successful at preventing theft. A second function is to exercise control over the bureaucracy to be sure that people are actually doing what Congress and the President think they are. Again, I think we have been quite successful at this. PPB emphasizes the budget as an instrument of decision making. I agree with the Subcommittee that a first step is to group programs into categories that are useful in analyzing their costs and benefits.

It is difficult, or impossible to devise a structure which is best for all functions of the budget. For some purposes, it is useful to preserve administrative lines of organization; for others, it is useful to cross such lines. Agencies have therefore tended to carry at least two structures simultaneously and to be prepared to relate changes in one to changes in the others. Our data systems, however, need the flexibility to meet the needs of all the structures we carry. This is a difficult task, but I believe we are making progress toward accomplishing it.

Finally, concerning the role of the budget, I too would like to quote from the 1961 Subcommittee report: "Two problems rank highest: How to make the budget more helpful in forward planning. And how to make it more useful in illuminating program choices and measuring program performance."

I believe that these are still critical problems. PPBS is an effort to meet these needs.

Question 4:

Within the Defense Department program budgeting has appeared to be helpful in some programs and less useful in others—for example, General Purpose Forces and Research and Development. What are the limitations—and hazards—of applying the PPBS approach to such fields? Is there a bias against innovation? How does experience in Defense in such fields bear on the application of PPB in non-defense areas?

Response:

General Purpose Forces and R&D questions are both difficult areas for analysis, but this is merely a reflection of the fact that they are difficult problems for decision-making.

In the case of General Purpose Forces, decision-making is made difficult by the complexity and uncertainty of the functions of these

forces, by the variety and complexity of the forces themselves, and by the sensitivity of their effectiveness to highly particular and unpredictable circumstances of a conflict.

These difficulties limit the role that analysis can play in making decisions on General Purpose Forces, but because the decisions are so difficult it is especially important to derive whatever help analysis can offer to the necessary judgments. Analysis will certainly not enable us to predict with confidence the outcome of a war between two armies, based on their paper characteristics. Yet a systematic comparison between the two forces can lead us to identification of inferiorities in our own forces that could be remedied, or superiorities that could be exploited. And, in fact, such systematic comparisons have given rise to a number of fruitful questions and subsequently to important, if limited, conclusions about the relative strengths of NATO and Warsaw Pact forces and about the design of U.S. General Purpose Forces. Analysis has led to a better basis of comparison among forces than a simple division count and, in so doing, has led to greater understanding of some of the problems of General Purpose Forces.

The role of analysis in the general purpose forces area is largely one of stimulating judgment by offering limited conclusions useful in the design of our forces. Certainly as we move toward shorter-run operational questions, greater weight needs to be given knowledge of the particular situation, because of the importance of particular details of the situation to the outcome. If this were not perceived, the improper application of analysis could constitute a hazard. To my knowledge, this fact has been sharply and clearly appreciated by all the responsible officials involved.

Programming of General Purpose Forces has provided significant advantages in readiness and economy. When a decision is made e.g. to add a division to the Army, the Programming system provides a useful vehicle to assure that the financial planning provides for all the resources needed in correct balanced amounts, and in proper phasing. It has also made it easier to perceive and correct inter-service imbalances, such as the deficiency in strategic mobility of our General Purpose Forces during the Fifties.

R&D covers a wide range of activities. Their common thread is the attempt to buy information. But at the basic research end, they aim to get information about basic physical relationships; at the engineering development end, they aim to learn to produce equipment whose characteristics are supposedly well known. Another difference between the two ends of the spectrum is in the number of projects and the cost per project. If we break R&D down into categories, the situation for Defense R&D in FY 1968 is as follows:

<i>Categories of R. & D.</i>	<i>Number program elements</i>	<i>Cost</i>	
		<i>Millions</i>	<i>Percent</i>
Major systems development	8	2,304	31
Other systems development	325	2,488	33
Exploratory development	70	964	13
Basic research	8	399	5
Support	46	1,368	18
Total	457	7,523	100

A small number of major development projects account for a substantial fraction of the R&D budget. Basic research is a relatively small fraction of the total and consists of a much larger number of individual projects than suggested by the program element total.

Many of the large programs at the Engineering Development end have been called into being by analysis of a military function to be performed better or more cheaply. Clearly, whatever the origin of a project, questions about what a proposed new weapon system is supposed to do, how well it will do it, and how much it will cost, are relevant to decisions on the later phases of R&D.

Basic research, however, is a more difficult problem for systematic decision-making because it is so difficult to specify the relation between input and output. Within any given field, the most reliable guide to the productivity of a research project is the judgment of the best people in the field about the competence of those involved in the project and about the expected contribution to knowledge in the field. And in fact such judgments play a dominant role in allocating research resources within various fields.

But it is also necessary to allocate resources among fields, and between research and other R&D activities. Where the government is financing research some admittedly very rough notions of the functional utility of advances has a role to play. That role requires at least rough comparison of the cost and effectiveness of alternatives that might be made possible by technological advances.

There is no reason known to me why PPB should stifle innovation. Quite the reverse. The problem of innovation is one of applying usefully the new knowledge we acquire from our basic research activities. Systematic comparison of alternative courses of action increases our insight into the cost and effectiveness of alternative means of achieving our objectives. A well-developed analytical framework can and often does provide innovators with a strong and effective case for prompt positive action on their proposals. This should stimulate rather than stifle innovation.

In non-defense areas, I would expect variation in the extent to which analysis can assist decision-making, similar to that which we have experienced in the defense areas. Where the problems are complex or where it is difficult to relate the means we choose to the outcomes we desire, the role of analysis will be relatively limited.

Question 5:

I presume you and I would agree that there is always the possibility of the abuse of any management technique. Cost-effectiveness study, like any other management tool, can be misused—to bias and mislead and becloud judgments of the decision-maker.

My impression is that business executives tend to have a far more realistic understanding of this fact than some zealots of PPB in government.

In this connection, I shall include in the record a statement by a consultant to business executives who works with the Chairmen of the Board, Presidents and Vice Presidents of nearly all of FORTUNE's 500—the 500 largest corporations in the U.S.—and ask you for your comment.

I have never met an American executive who would even conceive of a term like "computerized common sense".

Their understanding of the businesses that they are in is relatively profound, while their understanding of computers is relatively limited. Despite all the hoopla, they show no evidence of being willing to turn any of their important decisions over to computerized common sense. By and large, they treat the computers as information systems rather than decision-making systems. Their caution comes from a number of sources, not the least of which is the sure knowledge that an error affects their own personal income and the health of their business in a relatively short period of time.

With very rare exception they understand the implications of computer-generated information. In particular, they understand the possible abuse of power which could result from indiscriminate control of the computer and its attendant information. One result of this is that most American executives are having the computer department report directly to them by one means or another.

Response:

The statement quoted is one I can agree with completely, except in its emphasis on computers. The issues we most need to clarify concern the role of analysis in the decision-making process. I believe that there is no more reason to center the argument on computers than to center it on pencils and paper. Pencils have been used to arrive at silly or mischievous conclusions; computers offer the same latitude. Both are tools; both can assist in the decision process; neither is likely to dominate it.

Although I cannot identify the "zealots of PPB in government," I know of no faction within the Executive that proposes turning the decision process over to computers. And if they did exist and were successful in drawing the attention of responsible officials to their proposals, I don't think they would last long in Government. The Cabinet officers and agency heads I know are neither overawed by computers nor anxious to abdicate their role in decision-making to their staffs, let alone to one specialized part of their staffs, and still less to a device which, in its most highly developed form, has a far narrower mental process than a human idiot.

In particular, I want to stress my agreement with the conclusions quoted in the statement that the best safeguard against the abuse of any analytic device or procedure is to furnish the responsible officials with a small but highly competent staff, familiar with the procedure at issue. This is precisely why we have stressed the desirability of having analytic staffs that report directly to agency heads.

Question 6:

In his book *Decision-Making for Defense* (1965), Charles Hitch makes the point that systems analysis is still in a very early stage of development. He adds:

But I am confident that it has passed the point in its development which medicine passed late in the nineteenth century where it begins to do more good than harm.

In view of this estimate of systems analysis by Charles Hitch, would you not advise a President, his Cabinet officers, and Congress to look at the products of systems analysis with considerable skepticism?

Response:

I find nothing in Mr. Hitch's remark that warrants special skepticism about the products of systems analysis. Instead, this seems to me to be a moderate statement by a man who was instrumental in introducing systems analysis into the Defense Department. I hope

that it will tend to offset some of the concern about excessive zeal on the part of proponents of PPB.

Clearly, the President, his Cabinet officers and Congress must fit systems analysis into a context, including political considerations and other intangible factors, by introducing their own judgments about uncertainties, and value judgments. They should certainly be skeptical of any recommendation that omits vital factors or that preempts the exercise of their own judgment.

Question 7:

To what extent are the difficult foreign policy decisions that must be faced by the President, the Secretary of State, and the heads of related agencies ones on which budgetary considerations are of great or determining influence? For example, did budgetary considerations help in any way to bring the issues to a focus in the Cuban missile crisis, or the recent Middle East crisis—to name two very important crises—or in the decision to send some transport planes to the Congo?

Response:

PPB, as its name implies, is more relevant to the longer-run decisions about resource use than to short-term operational decisions. In a situation such as the Cuban missile crisis, budgetary considerations are not involved in the immediate decisions. However, earlier budgetary considerations do determine the range of responses available at the time the crisis hits. Long before the Cuban or Middle East situations came to a head, the President and Congress had made budgetary decisions which determined such things as the size and capability of the Sixth fleet and our ability to conduct aerial reconnaissance over Cuba.

In addition, many of the difficult foreign policy problems—particularly problems in our relations with the less developed world—involve the allocation of resources. Such things as the size and conditions of our economic assistance to another country or our willingness and ability to provide Peace Corps volunteers are very important aspects of our relations with them. These foreign policy problems are strongly influenced by budgetary decisions. A system such as PPB is essential to marshal and analyze the information which is relevant to these decisions.

Question 8:

What guidance does the Bureau of the Budget give on whether or not a given problem is worth the effort of a systems analysis study? I would suppose that in the case of some types and levels of problems, the wiser course may be not to spend the effort to collect the data and perform the systems analysis since the costs of this effort itself outweigh the expected benefits.

Are the agencies encouraged to consider the cost-effectiveness of using cost-effectiveness techniques?

Response:

As in any other kind of decision, decisions involving the allocation of resources for analysis themselves involve a mixture of judgment and analysis.

It is all too painfully clear, at the present stage of PPB's development, that we cannot subject all our problems—not even those where we are reasonably certain it would be warranted—to cost-effectiveness analysis. It is necessary, therefore, to allocate our analytic resources carefully. This has been recognized in BOB Bulletin 68-2, establishing PPB guidelines: "The limits imposed by the availability of analytic staff resources or other circumstances may in some cases make it impossible to provide full treatment of alternatives and their analysis in each Program Memorandum . . . This selectivity will not only produce desirable brevity in the Program Memorandum, but will also permit the focusing of the limited number of studies that can be done on the issues where they can have the greatest effect."

Decisions about doing cost-effectiveness analysis vary widely, of course, from decisions involving allocation of staff time, to decisions about whether to engage in a new data collection activity or about whether to enter into a research contract. Good analysts will analyze the costs and outputs of the alternatives open to them. A decision to enter into a research contract to improve our cost-effectiveness analysis, however, is, like many other research decisions, one where it is difficult to relate cost to expected outputs. Judgments about the problem area to be examined and about the quality of the researchers play a role here.

Decisions about what kinds of analysis to do, should be and are affected by judgments about the probable impact of analysis. These include judgments about the political feasibility of the various alternatives. And of course, the generation of alternatives, perhaps the most critically important element in decision-making, is a process involving interaction among analysis, informed judgment, intuition, and creative imagination.

Question 9:

In our *Initial Memorandum* we note the fact that a decade of intensive study and analysis by RAND and others preceded the introduction of PPB into the Department of Defense, and that nothing comparable has been done for other departments. Do you see the need for more of this kind of preparation in order to make the system work in other parts of the government? What plans are underway?

Response:

The experience gained, through the work of RAND and other policy research organizations, in the decade preceding the introduction of PPB into the Department of Defense was, of course, highly useful. It must be remembered, however, that the bulk of this work was concerned with specific policy questions or technical matters. Insofar as the results have contributed to a more general understanding of the role of research and analysis in the decision process, they can also be useful in the nondefense areas, and we have been attempting, with I believe appropriate caution, to learn from the Defense Department experience.

Certainly it would have been helpful to have had similar experience in other areas, but it seems to me that the principal benefit would have been the contributions to our substantive understanding of the problems. Such work continues to be needed, and, under PPB, the agencies are instructed to maintain continuing programs of study

and analysis, either within their own staffs or by employing contract research organizations. In some cases the departments have established or are considering establishing outside sources of analytic support. For example, OEO has a contract with the University of Wisconsin for studies of poverty, and HUD is considering alternatives for an Institute of Urban Development in response to a Presidential request mentioned in the President's Message on Rural and Urban Poverty.

Question 10:

You note in your statement a major problem you face in "securing appropriations for and developing experienced PPB staffs appropriately placed within the agencies to improve the quality of their planning processes."

This year Congress has turned down requests from the State Department, as well as from other agencies such as Treasury and the Post Office, for money to fund the implementation of PPB, including money for additional staff.

Why is it not possible to train present experienced agency personnel in the necessary techniques?

Response:

It is possible to train present experienced agency personnel in the necessary techniques, and we are doing so. Between August 1965 and the present, 78 Government employees have taken a nine-month university course at a university, and the Civil Service Commission has given a three-week course to 738, a one-week course to 64, and a two-day course to 2573. Some of these people, together with a few new ones brought into Government, will comprise the bulk of the agency PPBS staffs.

This does not end the problem, though. Once we have the people who will serve as PPBS staff, they must be assigned to PPB activities and so we have to have the positions for them to fill. A majority of PPB positions have been created by a change in the function of an existing job, but the agencies have also found it necessary to request some new positions. When I talk about the request for appropriations, I am talking about appropriations for these positions, not about the source of the people who will occupy them. Most of the positions will probably be filled by transfers.

Question 11:

In our *Initial Memorandum* we say: "It may be that Congress will wish to improve its own capability for systematic analysis of public problems in order to compete on more even terms with the Executive Branch."

Would you advocate systems analysis by Congress too?

What do you think of Daniel P. Moynihan's suggestion that Congress should now establish an Office of Legislative Evaluation in the GAO, which would have the task of systematically reviewing the program evaluations and "PPBS" judgments made by executive departments—in other words, the task of "evaluating the evaluators"?

Response:

I believe it would be desirable for Congress to improve its capability for systems analysis. However, the specific means by which Congress

should acquire and organize analytic staff support should be worked out by those with congressional experience.

Question 12:

Congress, of course, has the constitutional responsibility to establish the federal budget—including national security budgets. We are therefore particularly interested in how the introduction of PPB in the Executive Branch may affect Congressional consideration of the budget.

In April 1967 the Defense Comptroller, Mr. Anthony, prepared a draft of a proposed change in appropriation structure to conform to program categories. As you know, this proposal met with considerable Congressional resistance, and was never formally submitted. The existing appropriation categories are preferred by many members of Congress for purposes of review and control of the Defense budget.

We would appreciate your comments on this whole matter.

Response:

As I said in my statement to the Committee, the PPB process in Defense and its data needs have been added to those of the traditional budgetary system; both need simplification and ultimately some degree of integration. Translation of program decisions to budget terms and vice versa is very difficult to do on a timely basis. Moreover, there is a real need in Defense to integrate PPB more effectively with the management processes and systems in military headquarters, commands and installations. Ultimately, under the proposed Resources Management System in Defense, the program decision structure would be translated into meaningful overall operating budgets for individual commands and installations.

The Appropriations Committees of the Congress have expressed concern at the possibility of a change in appropriation structure which would conform the budget presentation to program categories. Because of this concern, no change will be made in the appropriation classifications or the accounting systems supporting the execution of the Defense program in 1968. Also because of this concern, the 1969 budget will be presented to Congress in the traditional format and appropriation classifications.

However, as Secretary McNamara stated in a letter of August 7, 1967 to Chairman Mahon, the internal analysis within Defense of the FY 1969 budget request will be based on an examination of total operating expenses of each of the main organizational components and programs of the Department of Defense. Once the budget has been formulated on this basis and final decisions have been made, the budget material will be translated to the traditional form for printing in the President's budget and submission to Congress.

As you know, the pending Defense appropriation bill for FY 1968 contains a section which provides as follows concerning the proposed Resources Management System of the Department of Defense:

Sec. 640(b). During the current fiscal year none of the funds available to the Department of Defense may be used to install or utilize any new "cost-based" or "expense-based" system or systems for accounting, including accounting results for the purposes prescribed by section 113(a)(4) of the Budget and Accounting

Procedures Act of 1950 (31 U.S.C. 66a(a)(4)), until 45 days after the Comptroller General of the United States (after consultation with the Director of the Bureau of the Budget) has reported to the Congress that in his opinion such system or systems are designed to (1) meet the requirements of all applicable laws governing budgeting, accounting, and the administration of public funds and the standards and procedures established pursuant thereto; (2) provide for uniform application to the extent practicable throughout the Department of Defense; and (3) prevent violations of the antideficiency statute (R.S. 3679; 31 U.S.C. 665).

If the Department of Defense develops a system of accounting support to the new Resources Management System which is approved by the Comptroller General and reported favorably to the Congress by at least May 15, 1968, Defense intends to make the new system operative by July 1, 1968 and to execute the 1969 budget on that basis, translating back from the appropriations enacted in the traditional classifications.

(Whereupon, at 12:20 p.m., the subcommittee recessed, to reconvene at the call of the Chair.)

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PLANNING—PROGRAMMING—BUDGETING

HEARINGS
BEFORE THE
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS
OF THE
COMMITTEE ON
GOVERNMENT OPERATIONS
UNITED STATES SENATE
NINETIETH CONGRESS
FIRST SESSION

PART 2

WITH
DR. ALAIN C. ENTHOVEN, ASSISTANT SECRETARY
OF DEFENSE (SYSTEMS ANALYSIS)

SEPTEMBER 27 AND OCTOBER 18, 1967



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PLANNING—PROGRAMMING—BUDGETING

WEDNESDAY, SEPTEMBER 27, 1967

U.S. SENATE,
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

[This hearing was held in executive session and subsequently ordered made public by the chairman of the subcommittee.]

The subcommittee met at 10 a.m., pursuant to notice, in room 3112, New Senate Office Building, Senator Henry M. Jackson (chairman of the subcommittee) presiding.

Present: Senators Jackson, Muskie, Harris, Metcalf, Mundt, and Baker.

Subcommittee staff members present: Dorothy Fosdick, staff director; and Judith J. Spahr, chief clerk.

OPENING STATEMENT OF THE CHAIRMAN

Senator JACKSON. The subcommittee will come to order.

This is the second meeting of our subcommittee in its inquiry on planning-programming-budgeting in the national security area. Since the major experiment to date with PPB has been in the Department of Defense, we are particularly concerned with the operation of the system in that department, and the lessons to be learned from that experience.

The subcommittee's interest is professional and nonpartisan. We are examining the risks and limits as well as the possibilities in the application of planning, program budgeting, systems analysis and cost-effectiveness study in the national security departments and agencies. At a later time in our study certain findings, suggestions and recommendations for improvement will be issued.

A key element in the PPB approach is systems analysis which is intended to present decision makers with a systematic comparison of the costs and benefits of alternative roads to a policy goal, using techniques described as operations research or cost-utility or cost-effectiveness studies, with an emphasis on quantitative analysis.

As was evident in our hearing last month with Budget Director Schultze, there is considerable uneasiness and doubt in Congress about the way some aspects of PPB and its techniques have been and are

being applied. Many of us here on the Hill are in the frame of mind of a former member of Congress from Missouri, Willard Duncan Vandiver, who in 1899 said:

I come from a State that raises corn and cotton and cockleburs and Democrats, and frothy eloquence neither convinces nor satisfies me. I am from Missouri. You have got to show me.

Our questions arise for a number of reasons, two of which I might emphasize here:

One: Systems analysis and cost-effectiveness studies are greatly oversold by many of the proponents. Clearly, cost-utility analysis in experienced hands and guided by good judgment can be a helpful tool in some aspects of government business. But from the perspective of Congress it is clear that in analysis aimed at policy making the relevance of the many factors and contingencies which affect the problem—including the feasibility of execution, political acceptability at home, and implications abroad—are so often more important than the mathematical or economic sophistication of the analytic techniques applied.

Two: At best, systems analysis is still in a very early stage of development and is bedeviled with difficulties. Roland McKean, co-author with Charles Hitch of *The Economics of Defense in the Nuclear Age*, recently made the point that

. . . actual analyses should be used with caution. Effects that are incommensurable or even nonquantifiable in any generally valid way (for example, impacts of alternative systems on the probability of war) abound; uncertainties about future contingencies are pervasive; heroic judgments have to be made; and the quality of analyses varies but is costly to appraise.

Beyond this, the abuse of cost-effectiveness studies is well known to those of us who serve in the various committees of the Congress. Cost-utility analysis can be used as easily to justify a decision as to make a sensible choice. It can be employed as a weapon to try to overwhelm and beat down other viewpoints. And no idea is so good that it cannot be killed by over-analysis.

The purpose of the hearing today is to have a frank exchange of views on the possibilities and limits of the tool called systems analysis, and on the main issues and problems that arise from its use in the Defense Department and in related areas of the federal government.

We are pleased to have with us today an able pioneer in systems analysis techniques—Dr. Alain Enthoven, Assistant Secretary of Defense (Systems Analysis). To his great credit, he was born in Seattle, Washington! He received his Ph. D. degree in Economics at MIT.

Following four years as a full-time staff member of the RAND Corporation, Dr. Enthoven joined the Department of Defense in May 1960, in the Office of the Director of Defense Research and Engineering. He was appointed Deputy Comptroller for Systems Analysis (Programming) on May 23, 1961; Deputy Assistant Secretary of Defense (Systems Analysis), Office of the Assistant Secretary of Defense (Comptroller) on October 18, 1962; and sworn into the newly established position of Assistant Secretary of Defense (Systems Analysis) on September 10, 1965.

We are happy that you could join us here this morning. You may proceed in your own way.

STATEMENT OF DR. ALAIN C. ENTHOVEN, ASSISTANT SECRETARY OF DEFENSE (SYSTEMS ANALYSIS) ON PLANNING, PROGRAMMING AND BUDGETING IN THE DEPARTMENT OF DEFENSE

Dr. ENTHOVEN. Mr. Chairman and Members of the Committee:

I am very happy to testify before this committee. Over the years this committee and its predecessors have provided a most valuable public service as a forum for thoughtful, professional, non-partisan study and discussion of national security policy machinery, staffing, and operations. I have followed this work with interest and personal benefit. I consider it a distinct privilege to be asked to contribute.

I am especially pleased to have the opportunity to discuss with you the Planning-Programming-Budgeting System in the Department of Defense. For this committee, like others in the Congress, called for many of the reforms that are now summarized by the letters "PPBS." It is fitting that you should now review the record to derive conclusions that will serve as a foundation for future progress.

WHY PPBS?

One way to explain PPBS, and why it is needed, is to contrast it with the way Defense budgets were prepared prior to 1961. In doing this I do not in any way wish to criticize the previous administrations of the Defense Department or to belittle their very substantial contributions to better management. I simply want to discuss where we were so that you can see clearly what direction we have taken and what distance we have covered.

Before 1961, Defense budgeting and the planning of the strategy and forces were almost completely separate activities, done by different people, at different times, with different terms of reference, and without any method for integrating their activities. Forces and strategy were developed by the military planners; budgeting was done by the civilian secretaries and the comptroller organization.

The strategy and force recommendations of the Military Services and the Joint Chiefs of Staff were developed, for the most part, without any explicit reference to costs. Systematic information on the full financial costs of alternative strategies or forces was not available.

The Defense budget was based on a predetermined financial ceiling. This ceiling was in turn based on judgments about the nation's capacity to pay, but without explicit reference to military strategy or requirements. Systematic information on the implications for strategy or forces of different budget levels was not available.

If bought and fully supported, the forces recommended by the Services and the Joint Chiefs of Staff would have cost much more than the Administration was willing to pay. This is not surprising or unusual. The bargaining process by which the recommended forces and the budget ceiling were reconciled, however, led to serious problems. As the budget examiners bore down to meet their predetermined targets, the Services held on to their force structures and their most glamorous weapon systems. What normally gave way were the less glamorous support items: ammunition and equipment inventories, support personnel, spare parts, etc. The result was unbalanced forces

that could not have been readily deployed into combat. The glamorous weapon systems had been retained, but at the cost of reducing important items of supply to a few days or weeks.

The Congress was aware of the defects of this bargaining process and criticized it. For example, in April of 1960, the House Appropriations Committee Report on the Defense Appropriation Bill said:

Piecemeal financing resulting from conformity to fixed expenditure ceilings, coupled with the attempt to keep going as many as possible of the promising programs, has all too often resulted in weapon systems being advanced to the readiness-for-production stage much too late to be of maximum effectiveness for the purpose intended. In too many instances these programs were delayed, cut back, or stretched out, because of the expenditure limitations. As a result valuable time was lost and the weapon systems became obsolete before they could be developed. It is the sad story of "too little, too late."

Simply stated, the problem is merely one of taking into account the full implications of the entire financial burden over the life, involving a period of years, of each and every military development project at the earliest possible date. This has not been done in the past, and particularly at the highest levels in the Executive Branch where control has tended in recent years to evolve to that of the single expenditure limitation. The expenditure limitation is such an easy method of establishing a control it can be exercised by a single person in a key decision making position. This method of control, however, tends to ignore the detailed project evaluation of expert staff at lower levels, procedures for which have evolved over a period of many years.

What is happening under the circumstances described, is that the military services are allowed to proceed with a multiplicity of development projects up to the point where further development or production bumps against a rigid expenditure ceiling. It is often only at this point that a decision is made as to whether or not to proceed further with a particular project. Consequently, many projects are canceled, at this point in time not because they are not successful or desirable developments, but only because to proceed further would involve the expenditure of funds in excess of a preconceived expenditure limitation.¹

Military planning was done in terms of missions, weapon systems, and forces—the "outputs" of the Defense Department. Budgeting was done by object classes or appropriation titles—Procurement, Operations and Maintenance, Military Personnel, Research and Development, and Construction—the "inputs" to the Department. There was no machinery for translating appropriations into the forces or missions they were to support. Thus, it was not possible for the Secretary of Defense, the President, or the Congress to know in meaningful terms where the Defense dollars were going.

Senator Lyndon B. Johnson, then Chairman of the Senate Preparedness Investigating Subcommittee, stated:

Two of the members of the Joint Chiefs of Staff agree that too much money is being spent during fiscal year 1959 for defense against manned bombers, yet the Department of Defense had no specific figures as to how much was being devoted to continental air defense in the 1960 budget. Furthermore, despite all the glowing statements and promises concerning unification in the Department of Defense, the testimony before this and other committees clearly shows that the 1960 budget was never considered, nor were decisions made, on a functional basis for the Department of Defense as a whole but rather decisions were made on a service-by-service basis in relation to individual expenditure targets.²

Thus, the Defense budget was not the vital policy instrument it should have been. In the words of this subcommittee:

Federal budgetmaking, in the main, has concentrated on developing information useful for day-to-day administration of the departments and agencies. Not nearly as much attention has been paid to preparing budgets in such a way as

Ed. note—The footnotes are set forth on p. 260.

to make them most useful in establishing priorities, in forward planning, in choosing between programs, and in measuring expenditures against meaningful performance yardsticks.

This is in strong contrast to the contemporary budgetary practices of progressive private organizations—business firms, banks, and universities. A modern corporation uses the budgetary process for much more than checking costs and controlling expenditures. It employs it as a main tool in planning its corporate future. Budgeting is used to help decide upon capital expenditures and establish product lines, to spot management weaknesses, and, most important, as an early warning system of problems and opportunities coming up on the corporate horizon. Programs and budgets extending several years into the future have become the rule.⁴

The fact that Defense financial planning was done on a year-by-year basis was particularly detrimental to good planning. Again in the words of this subcommittee:

Particularly in the area of national security, our Government needs to extend its budgetary time horizons farther into the future. We need to know where the cost of present plans and activities may take us, not simply through the next fiscal year, but for several years ahead.

A 12-month budget reveals only the tip of the fiscal iceberg. The initial outlays for the man to the moon program will result in billions of dollars being spent during the remainder of this decade. The development of major weapons systems and foreign aid programs are other obvious cases in point. Cost estimates, to be meaningful, must be based on the full expected lifetime of programs.

Longer term budgetary projections do not imply a change in the present system of presenting a budget to the Congress each year, and voting appropriations on an annual basis. Nor is the aim to make in 1962 decisions that can only be made in 1966. It is to take greater account of the consequences in 1966 of the budgetary decisions which must be made in 1962.⁴

Finally, the Defense Department lacked measurable criteria by which to evaluate the effectiveness of alternative programs. As this subcommittee said:

Business has a yardstick for judging its effectiveness—profit and loss statements. Efficiently run private enterprises also hold their managers strictly accountable for results.

It is necessarily more difficult for our Government to determine how well its national security programs are faring. By what criteria do we measure the success or failure of some assistance programs? How do we judge whether we are getting the most for our money?

Granted the difficulties, our Government pays insufficient attention to this problem of performance measurement. The whole field is almost unexplored.⁴

WHAT PPBS IS AND IS NOT

Your excellent staff has done a thorough job of identifying the literature on PPBS. As a result, I am sure this committee is familiar with the main principles of PPBS, and has available to it good descriptions of the technical details. Rather than repeating or attempting to summarize this material, I think it would be more useful to discuss some of the main aspects of the way we actually do Planning, Programming, and Budgeting in the Defense Department today.

First and fundamental is the fact that since 1961, the Secretary of Defense has not operated with any predetermined budget ceiling. Rather, he judges each proposal on its merits, considering the need, the contribution of the proposal to increased military effectiveness, and its cost in national resources. The total Defense budget recommended by the Secretary of Defense to the President, and by the President to the Congress, is the sum of many such judgments about military need and effectiveness and their relation to cost.

While it is inevitable that many will disagree with the Secretary of Defense on specific decisions, it seems clear to me that this is the most rational and balanced way to approach the Defense budget. Moreover, I believe the Secretary of Defense sits in the best place to make such judgments, subject, of course, to review by the President and the Congress.

I recall the reaction by a friend of mine, then in Programming in the Joint Staff, to the first presentation by Mr. Hitch of the principles of PPBS: "Good. From now on, whenever the Secretary of Defense wants to cut the Army's budget, he will have to name the units." That is true, and as it should be. Of course, this approach makes great demands on the Secretary of Defense because it forces him, with the help of his staff, to become acquainted in detail with the merits of many proposals. It gives the Secretary of Defense a lot of homework to do. It is clearly much tougher than simply decreeing across-the-board cuts based on some arbitrary financial limit.

To consider these proposals, the Secretary must have a systematic flow of information on the needs, effectiveness, and cost of alternative programs, including differing opinions on them when they exist. We are organized to provide this information.

Second, decision making on strategy, forces, programs, and budgets is now unified. A decision to increase our forces or to start a new weapon system is a decision to add the required amounts to the financial plan. The machinery by which this is done is the Planning-Programming-Budgeting System.

The key to this system is decision making by missions, i.e., by the "outputs" of the Department of Defense rather than solely by the "inputs".

We call the basic, mission-oriented building block of the programming structure a "program element". A program element is an integrated activity, a combination of men, equipment, and installations whose military capability or effectiveness can be related to our national security policy objectives. For example, B-52 wings, infantry battalions, and attack submarines, each taken together with all the equipment, men, installations, and direct support required to make them effective military forces, are program elements. The program elements are then assembled into "major programs" defined by mission. A major program contains closely related elements which must be considered together in arriving at high-level management decisions. For example, Strategic Retaliatory Forces, General Purpose Forces, and Airlift-Sealift Forces are major programs.

A program element has both costs and benefits associated with it. The benefits are the ways in which it helps us to achieve broad national security objectives. The costs include the total system cost, regardless of appropriation category, projected systematically five to ten years into the future.

PPBS enables the Secretary of Defense, the President, and the Congress to focus their attention on the major missions of the Department of Defense, rather than on lists of unrelated items of expenditure. For example, in making decisions about Strategic Retaliatory Forces, the Secretary looks at the threat, at our national objectives, and at alternative plans to meet our objectives, their effectiveness, and their costs.

He reviews the data on these matters with the Joint Chiefs of Staff and the Services, obtains their advice, and makes decisions on the forces. From there on, the breakdown of the budget by Service and appropriation title is largely derivative, a process left mostly to the staff.

The advice of the Joint Chiefs of Staff is systematically sought and included in this process. In particular, they now have cost data that enable them to estimate the financial implications of their force recommendations. Thus, force requirements and strategy are effectively related to costs early in the decision making process.

Each spring, the Joint Chiefs and the Services send the Secretary of Defense their recommendations on forces, together with supporting data. The Secretary reviews these recommendations, and, during the summer, sends the Joint Chiefs of Staff and the Services the results of his review in the form of memorandums—called Draft Presidential Memorandums. These drafts summarize the relevant information on the threat, our objectives, the effectiveness, and cost of the alternatives he has considered and his tentative conclusions. With rare exceptions the Joint Chiefs and the Services have a month to review and comment on each of these drafts. They comment in detail. The Secretary reviews the comments thoroughly. He revises his tentative decisions, has more discussions with the Chiefs and the Services, and gradually develops a program and a budget. This dialogue continues for months. It is in sharp contrast to the situation the Senate Preparedness Subcommittee found in 1959:

Furthermore, the Joint Chiefs as a group were given only 2 days to consider the total program and never considered such important aspects as the size of the Army, whether to include an aircraft carrier or—most fundamental of all—what deterrent forces are needed.⁶

The results of the process are summarized in the Five Year Defense Program. It includes an eight-year projection of all approved forces, and a five-year projection of costs, manpower, procurement, construction, etc. This document enables all top Defense officials to be readily informed about the total Defense program and its components.

The decisions in the Five Year Defense Program do not represent a five-year commitment by the President or even by the Secretary of Defense. Nor do these decisions "tie the President's hands." The President and the Secretary of Defense retain their flexibility to change these decisions as they should. Rather, the Five Year Defense Program represents the sum total of programs that have been tentatively approved for planning purposes by the Secretary of Defense. You might say it is an official set of assumptions about what forces we currently plan to request authorization for in the future, assumptions from which the financial planners can derive the budget requests required to support these forces.

Moreover, the Five Year Defense Program is not a complete master plan calculated in minute detail at the top and handed down to the troops for execution. It is a set of broad planning guidelines that help us all to pull together in the same direction instead of at cross-purposes. It is not a substitute for individual initiative or for the many benefits that we get from competition among and within the Services. The Planning-Programming-Budgeting System is not what makes

the Department of Defense run. The initiative, the drive, the imagination, the dedication, the judgment, and the hard work of a great many people, makes the Department of Defense run and progress. PPBS is a flexible tool to channel this creative energy, as much as possible, along rational and useful lines.

WHAT SYSTEMS ANALYSIS IS AND IS NOT

Hardly a week goes by that I don't read some fantastic description of systems analysis in the Pentagon. The more I read about it in the public press, the more I get the feeling I must not be doing it. According to some accounts, the essence of systems analysis is the application of computers and fancy mathematics to reduce all issues to numbers, with lots of attention to cost and none to effectiveness, and with a complete lack of interest in military judgment or anyone else's judgment. If I believed that even a small fraction of such descriptions were accurate, I would recommend to Secretary McNamara and Deputy Secretary Nitze that they fire me; I am sure that if they believed I was trying to replace their judgment with a computer, they would not wait for my recommendation.

In fact, systems analysis is just one name for an approach to problems of decision making that good management has always practiced. The essence of systems analysis is not mysterious, nor particularly complicated, nor entirely new, nor of special value only to Defense planning. Rather, it is a reasoned approach to highly complicated problems of choice characterized by much uncertainty; it provides room for very differing values and judgments; and it seeks alternative ways of doing the job. It is neither a panacea nor a Pandora's box.

Decisions must be made by responsible officials on the basis of fact and judgment. Systems analysis is an effort to define the issues and alternatives clearly, and to provide responsible officials with a full, accurate, and meaningful summary of as many as possible of the relevant facts so that they can exercise well-informed judgment; it is not a substitute for judgment.

You might object, "But you're merely describing disciplined, orderly thought; why call it 'systems analysis'?" Most labels are imperfect; this one is no exception. We use the phrase "systems analysis" to emphasize two aspects of this kind of thinking.

First, every decision should be viewed in some meaningful context. In most cases, decisions deal with elements that are parts of a larger system. Good decisions must recognize that each element is one of a number of components that work together to serve a larger purpose. The strategic bomber, the airfield, the pilot, the fuel, and the spare parts are all parts of a weapon *system*. One cannot make sense out of airfield requirements without looking at the objectives the bomber is intended to achieve. For some purposes, it is necessary to look at the airfield construction program as such; there would be no sense in building a new bomber base if a perfectly good transport base were being vacated a few miles away. Systems analysis emphasizes the airfield as a part of the weapon system. Similarly, to make sense of strategic bomber requirements, you need to look at other strategic offensive weapons, such as missiles.

There is nothing mysterious about this kind of thinking. Informed men in the Congress, the Executive Branch, and elsewhere have been pointing out the need for such an approach for years. We are doing it, and we have given it a name.

The word *analysis* is used to emphasize the need to analyze complex problems, that is, to reduce them to their component parts. Then each of the component parts can be studied by methods appropriate to it. Logical propositions can be tested logically; questions of fact can be tested against the factual evidence; matters of value and uncertainty can be exposed and clarified so that the decision makers can know exactly where to apply their judgment.

Systems analysis is not a substitute for judgment; it is an aid to judgment. It helps by isolating those areas where judgment must be applied and by indicating to the decision maker the potential significance of each of the alternatives he might choose. Systems analysis is not a "wholly rational basis for decision making? . . . [a] technocratic utopia where judgment is a machine-product?"⁷

Far from it. It is based on the fact that most decisions in Defense are at least partly susceptible to rational treatment, and it tries to deal with these in a disciplined way, leaving the responsible decision makers more time to ponder the imponderables and weigh the intangibles.

One of the foundations of systems analysis in the Department of Defense is the concept of "open and explicit analysis." Unfortunately this is not something that is discussed in the formal literature on analytical methods, but it is very relevant to the concerns of this committee. In fact, this concept is the single most important idea I have to communicate today.

An analysis is "open and explicit" if it is presented in such a way that the objectives and alternatives are clearly defined, and all of the assumptions, factors, calculations, and judgments are laid bare so that all interested parties can see exactly how the conclusions were derived, how information they provided was used, and how the various assumptions influenced the results. We do not achieve this in every case, but this is the objective, and important issues are almost always approached this way.

In other words, systems analysis is a method of interrogation and debate suited to complex, quantitative issues. Systems analysis is a set of ground rules for constructive debate; it gives the participants useful guidelines for proceeding to clarify and resolve disagreements. It requires the participants to make their methods of calculation and their assumptions explicit so that they can be double-checked; it helps to identify uncertainties, makes these uncertainties explicit, and aids in evaluating their importance; and it identifies and isolates issues.

In cases of substantial disagreement, it is much better to join your adversary in a joint analysis than to restate without change last year's arguments for last year's frozen position. Joint analyses often narrow the differences, and sometimes lead to agreement, by helping the adversaries to persuade each other of the merits of their arguments and by identifying new alternatives that are mutually more satisfactory.

This is an especially important aspect of systems analysis as it operates in the Department of Defense. Frequently, when there are differing points of view on the value of a proposed program, the Secretary of Defense asks us to prepare a memorandum listing points of agreement and disagreement. For each of the points of disagreement, an agreed calculation is performed which shows the implications of each person's assumption. The Secretary of Defense is then able to see exactly what the issues are, how important they are, and what judgments he must make in order to resolve them.

For example, last year the Secretary of Defense got conflicting estimates from my office and from the Army of the probable damage to the United States and the USSR resulting from various possible thermonuclear wars, with alternative anti-ballistic missile defense systems. He asked the Secretary of the Army and me to prepare a joint memorandum describing points of agreement and disagreement in such a way that the total difference would be explained explicitly, and our arguments would meet "head on." The Secretary of the Army and I explored the calculations in considerable detail and identified the assumptions that accounted for the difference. We then discussed each of these assumptions, reached agreement on some, and agreed to disagree on others. We then prepared a set of calculations and a table of results which we both agreed was a fair representation of what would happen under each set of stated assumptions.

The value of such a table to the Secretary of Defense, the President, members of Congress, and other officials in government is that it isolates the important assumptions and calls to their attention the key judgments that must be made. Systems analysis thus aids and focuses judgment; it does not replace it. Incidentally, this table was used in summary form in Secretary McNamara's presentation of the anti-ballistic missile defense issue to the Congress last winter.

I might add that, partly as a result of that dialogue and similar work with the Joint Staff and the Services, we now have an agreed set of methods for calculating the results of thermonuclear war under alternative assumptions. We can all make the same assumptions and get the same answers. We don't always agree on the assumptions, but the agreement on methods of calculation now permits the Secretary of Defense, the Joint Chiefs of Staff, the Services, and others to concentrate their attention on determining which assumptions they consider most realistic. This is one valuable contribution that systems analysis makes to decision making.

The open and explicit approach is fundamental to systems analysis as it operates in the decision making process of the Department of Defense. Open and explicit analysis is our best protection against persistent error. Also, the open and explicit approach makes it very difficult, if not virtually impossible, for any group to rig or manipulate the results. When the Air Force sends the Secretary of Defense an analysis of the requirements for a new bomber, a copy is also sent to my office. We take it apart and see what makes the analysis come out as it does. When my office or the Office of the Director of Defense Research and Engineering does an analysis on bombers, a copy goes to

the Air Force. If you think Harold Brown and his staff are going to let my analysts get away with rigging an assumption to prove a point, then you don't know Harold Brown and his staff. And, of course, we try to provide them with the same assistance. I can assure you that the Secretary of Defense hears all sides, and when he gets a joint analysis, he gets a much more precise statement of the issues than would otherwise be the case.

We don't succeed in doing this in every case, sometimes because of the pressure of time, sometimes because one of the interested parties is unable or unwilling to pursue a joint analysis. Nevertheless, this is our objective, and we are achieving it in a growing number of cases.

Systems analysis usually includes some calculations. Where appropriate, it includes the application of modern methods of quantitative analysis, including Economic Theory, Mathematical Statistics, Mathematical Operations Research, and various techniques known as Decision Theory. However, systems analysis is not synonymous with the application of these mathematical techniques, and much of the most important systems analysis work in the Department of Defense does not use them.

Systems analysis is not an attempt to measure the unmeasurable. But one of the opportunities that systems analysis offers for creative work is seeking ways of giving valid measurement to things previously thought to be unmeasurable. A good systems analyst does not leave considerations that cannot be quantified out of the analysis. Inevitably such considerations will be left out of the *calculations*, but a good analyst will and does list and describe such factors.

Systems analysis is definitely not synonymous with the application of computers. We sometimes use computers, we also use pencils, paper, slide rules, telephones, etc. The computer aspect has been grossly overplayed in many discussions of systems analysis. The use or misuse of computers is too minor an aspect of this subject to be relevant to the serious concerns of this committee.

“COST-EFFECTIVENESS” ANALYSIS AND THE RELEVANCE OF COST

Some of the main tools of systems analysis come from Economics. Where appropriate, we approach problems of choice by defining the objectives, identifying alternative ways of achieving the objectives, and identifying the alternative that yields the greatest effectiveness for any given cost, or what amounts to the same thing, that yields a specific degree of effectiveness for the least cost. In other words, the main idea is to find the alternative that yields the greatest military effectiveness from the resources available.

Systems analysis includes a critical evaluation of the objectives. It recognizes that most ends are, in fact, means to still broader objectives. For example, an ability to destroy a particular target is not likely to be an end in itself; it is a means to some more basic end such as deterrence. Therefore, a good systems analyst will seek to determine whether or not the pursuit of certain intermediate objectives is the best way of pursuing the broader ends.

Thus, systems analysis is often associated with “cost-effectiveness” or “cost-benefit” analysis. The term “cost-effectiveness” analysis is often

misunderstood. It seems to suggest to some people a notion of "cost-effectiveness" that is somehow to be contrasted to "military-effectiveness" or just plain "effectiveness." It might be better if we used the expression "military effectiveness in relation to cost," or simply "the best mix of military forces."

The point is that every weapon system we buy has both benefits and costs associated with it. You cannot get "effectiveness" without paying a "cost." Each program uses up resources that could otherwise be put to some other useful purpose. Sensible decisions on the use of these resources must depend on the costs incurred in relation to the military effectiveness obtained. "Cost-effectiveness" analysis is nothing more than an attempt to identify the alternatives that yield the most effectiveness in relation to the money spent and other costs incurred.

The main line of attack on "cost-effectiveness" analysis is an attack on the relevance of cost. One frequently hears statements to the effect that considerations of cost have no place in matters of national security.

I certainly agree that we cannot afford to buy less than the military forces we really need, and that we must not let defense spending be constrained by arbitrary financial limits that are unrelated to military needs. But it is simply naive to assert, as some people do, that the cost we pay for our military power is irrelevant. Our experience with the war in Southeast Asia each day demonstrates the opposite conclusion. We are in the midst of a great national debate over whether the objectives we are fighting for are worth the cost. Whatever the merits of the particular arguments, it is clear that the cost is relevant if for no other reason than that it affects popular support for the war effort.

I think the key point on the relevance of cost was made by the distinguished chairman of this subcommittee 6 years ago when he said:

Rich as we are, we cannot do all the things we would like to do to assure the national safety and provide for the general welfare.

The job of the President is to rank the competing claims on our resources in terms of their national importance—to distinguish between what cannot wait and what can wait.*

One hears other criticisms of "cost-effectiveness" analysis. Does PPBS *necessarily* lead to an overemphasis on cost? It does not. I would like to know how anyone who claims that it does can reconcile that conclusion with the sharp increase in Defense budget requests in the two years after 1961.

Cost in any program merely represents "effectiveness foregone elsewhere." The reason that the Secretary of Defense cares about the cost as well as the effectiveness of proposed weapon systems is because he recognizes that the dollars used to support a particular program represent resources that could possibly be used to greater benefit elsewhere. Cost and effectiveness must be related to achieve national policy goals, just as the front and rear sights of a rifle must both be used to hit the target. The position of the rear sight matters only in relation to the front sight. Likewise, the cost of a program matters only in relation to the military effectiveness provided, and *vice versa*.

Does "cost-effectiveness" analysis stifle innovation? On the contrary, such analysis has given the proponents of good ideas a better way of making their case and of getting prompt and favorable decisions. I

would cite, as examples, such new systems as the Minuteman II, Minuteman III, and Poseidon strategic missile systems; Multiple Independently-targetable Re-entry Vehicles (MIRVs) that enable one ballistic missile to destroy many separate targets; the Short Range Attack Missile known as SRAM; the Sprint and Spartan anti-missile missiles and the new phased array radar that will guide them; the A-7 fighter bomber; the C-5A transport aircraft; the Fast Deployment Logistic Ships; and the Airmobile Division. In each case, some very good ideas were identified early and sold on the basis of "cost-effectiveness" analysis. Also, by helping to cut back programs that are based on poor ideas, "cost-effectiveness analysis" helps to leave more resources available for the most effective programs.

Does "cost-effectiveness" analysis always lead to a preference for the cheapest system on a unit cost basis? The record shows it does not. I just mentioned a number of systems that were justified on the basis of "cost-effectiveness" analysis, each of which costs more per unit than its predecessor. However, in each case the margin of extra effectiveness per unit is worth the extra cost.

A popular remark among the critics of PPBS is that we would never have developed and procured the Polaris weapon system if it had had to pass the "cost-effectiveness" test because it costs more per missile than Minuteman. This charge is particularly ironic in view of the facts. One of the first things that Secretary McNamara did as Secretary of Defense was to more than triple the rate of Polaris submarine construction in order more rapidly to achieve an invulnerable retaliatory force. The Navy's recent proposal to develop Poseidon also got very prompt and favorable treatment from the Secretary. Poseidon missiles will cost much more than the Polaris missiles they will replace, but analysis makes it clear that their extra margin of performance is worth the extra cost.

Does "cost-effectiveness" analysis or systems analysis lead to an over-emphasis on factors that can be reduced to numbers? Not necessarily. A good analysis of the numerical factors leaves the decision makers more time and energy to weigh the intangibles.

In this connection, let me comment on an example that is used in support of the opposite view. Your *Initial Memorandum* says:

Skybolt presumably did not meet the Defense tests of cost-effectiveness, but one wonders whether, in estimating the costs of its cancellation, allowance was made for the impact on the British Government and perhaps on French policies in Atlantic and West European affairs.⁹

Yes, allowance was made for the impact on the British. There is no question that the Secretary of Defense and his main advisors were keenly aware of the political implications of Skybolt for the British. In fact, Skybolt was kept alive for many months and millions of dollars longer than it otherwise would have been precisely because of the British interest. But, it finally got to the point that the expected effectiveness of Skybolt fell so low, and the projected costs rose so high in relation to competing systems, such as Minuteman, that the President and the Secretary of Defense, reached the conclusion that Skybolt would not be satisfactory for the British, and was clearly unsatisfac-

tory for us. Continuation of Skybolt would have only postponed the political problem, not avoided it.

RISING COSTS OF SKYBOLT

Senator MUSKIE. Mr. Chairman, I know you plan to have Dr. Enthoven complete his statement before we begin the questioning. But may I ask one question at this point?

Senator JACKSON. Certainly.

Senator MUSKIE. You say, "In fact, Skybolt was kept alive for many months and millions of dollars longer than it otherwise would have been" and then it was dropped because "projected costs rose so high."

Did these costs rise that precipitously, in a matter of months? If so, why?

Dr. ENTHOVEN. Yes, Senator, the cost estimates did rise precipitously in a matter of months.

The development and procurement cost of the Skybolt Program was estimated by the Air Force early in 1960 at about \$890 million; the original estimates were lower. Then, in about four successive rounds of increase the Air Force's own estimates rose to \$2.3 billion by July 1962. In the final crunch the estimates by my office and the Office of the Director of Research and Engineering, gave pretty convincing evidence that it was going to hit something like \$3 billion.

Why did it happen? I think in part because, quite frankly, the costs had been underestimated at the beginning. This was done partly by people who were enthusiastic for the proposal and who wanted to get it going. They thought that it would be more palatable and more likely to sell if they did so. That was part of the unwritten rules of the game at the time.

It worked because there was nothing in the system to tie people to their original cost estimates.

One of the reasons we set up the Programming System was so that we could write down and get a signature on the initial cost estimates of a weapon system we could then translate into budgets and thereafter make the people live with the cost estimates on the basis of which the decision was made to go ahead. If they then wanted to change the cost estimates, we could at least require them to explain it.

Senator MUSKIE. So there was a weakness in the analysis as applied to Skybolt, which in your judgment, has since been corrected?

Dr. ENTHOVEN. Yes, sir.

I certainly don't want to imply that it has been perfectly corrected, or that it is anywhere close to perfection. I don't want to overstate our position. But I do believe that the margin of error has been reduced a lot. That kind of gross underestimation followed by successive cost increases is now much less likely to occur.

In the 1950's, cost estimates for new weapon systems were sometimes off by a factor of 3 or 4. That is, the costs ended up 3 or 4 times what was originally estimated. Now I can give you only an impressionistic guess: maybe the errors are getting to be more like plus or minus 20 or 30 percent.

So we still have work to do.

I do believe it is fair to say that we have made a lot of progress in cost estimating methods.

ROLE OF SYSTEMS ANALYSIS AND PPB IN SKYBOLT CANCELLATION

Senator MUSKIE. Could you give us any more specific picture of the nature of the correction which has been made in the system?

Dr. ENTHOVEN. Yes, sir.

Under the previous system, when the budgeting was done a year at a time, there was no formal, explicit documentation of the full projected costs of each weapon system, year by year out into the future.

The Office of the Secretary of Defense and the Services merely argued only about what was going to be in this year's budget. So in selling Skybolt, for example, the Air Force was able to claim that the complete cost was going to be \$800 million. But the only part that really got written down and nailed with formal documentation was, say, \$30 or \$40 million going into this year's budget.

When we built the Programming System, we were very conscious of that. You might even say that Skybolt was the first casualty of the Programming System. That is, the Secretary of the Air Force was required to sign a document that laid out not only this year's cost but next year's and the year after, all the way to completion. Then, when next year came around and they asked for a lot more money than was in that document, we said, "Why?"

They said, "Well, the costs have gone up," and Mr. McNamara said, "No, that is not good enough. You told me that the costs were going to be this and they can't go up without an explanation. Of course, if some new thing happened, if the scientists invented a better way of making Skybolts so that they were more effective and there was some explicit, identifiable change, okay. But just on under estimation? We are going to discipline that."

Senator MUSKIE. So Skybolt in a sense was a horrible example which has had a disciplinary effect upon the development of the system?

Dr. ENTHOVEN. I believe so, yes. The documentation with a signature now that brings that discipline.

I don't think it is perfect. We keep on finding the normal kinds of lapses that happen in human affairs, but I think we are doing a lot better.

Senator MUSKIE. The reason I asked my question was because, in the context of your prepared statement, I got the impression that this variation in costs—the skyrocketing costs—developed under the PPBS system. It didn't. It was an incident in a period when you were shifting from the old system to the new system.

Dr. ENTHOVEN. Yes, sir.

In fact, a couple of studies have been done on this, one at the RAND Corporation and one by some people at the Harvard Business School, that brought out the fact that during the 1950's new weapon systems typically ended up costing three or four times what they were originally estimated to cost. There was even a case where one cost ten times as much. All this is after correction for the change in the price level, for wages, and for the number produced.

Senator JACKSON. The change orders?

Dr. ENTHOVEN. Yes.

Senator JACKSON. You have to allow for the change orders.

Dr. ENTHOVEN. Yes. That gets to be a terribly complex problem.

We are trying to discipline this, both by the Programming System that I described and by more sophisticated contracting procedures.

I believe that when the RAND Corporation and the Harvard Business School do the same study for the 1960's, they will find substantial progress though not perfection, and that we are not likely to have many such big horrible examples.

Senator JACKSON. Senator HARRIS.

RISING COSTS OF TFX

Senator HARRIS. Mr. Chairman, this may be something that you would want to go into in more detail later. I will just ask one question about it.

It has to do with the TFX.

I just want to go into one aspect of it—the overruns in cost. Dr. Enthoven, I can't reconcile your statement here about the improvements you have made in the system to guard against these tremendous underestimations of cost with what happened on TFX.

You say Skybolt caused you to change around, and that that can never happen again. Then you look at the TFX thing and it seems to have happened.

Dr. ENTHOVEN. Let me be clear. I didn't say, and certainly didn't mean to imply that increase in cost estimates can never happen again. What I did say is I think we are doing better.

The TFX, sir, is a terribly complex issue which will take a long time to unravel.

Senator HARRIS. I agree.

That is why I wanted to go into one aspect of it.

Senator JACKSON. We will try not to retry it here.

Dr. ENTHOVEN. I think the key point here is this: The initial cost estimates were made in the framework of the old system. We didn't get the Programming System going, until 1962, and that was the first model. The Programming System we are discussing today wasn't close to full development before 1963. The estimates people point to now when they say the TFX costs have gone up, for example, the \$2.8 million per plane for the F-111, were estimates made under the old system, not by the Office of the Secretary of Defense, but by the people who were trying to sell it.

Mr. McNamara made it clear at the time that he didn't believe those estimates, that they were, in his judgment, clearly underestimates of the cost of the TFX.

I think that as of early 1964, we had estimates that were much more realistic; estimates, in fact, that over the past three and a half years have held up pretty well, within, say, 20 percent, after you adjust for changes in the general price level, changes in the number produced, and significant design changes. Then you get down to a level where it gets very hard to sort out the effects of change orders, that is changes in the design of the system, which are desirable and justifiable.

That is, the scientists come along and say, "We have invented a better electronic system that will make this plane twice as accurate. It will increase the cost 10 percent but it will increase the effectiveness by 100 percent."

We look at that and it appears to make sense, so we say, "Okay, we will go ahead with it."

There have been a number of such changes in the TFX. The original estimate of \$2.8 million that is so often quoted left out a lot of things like the Navy's Phoenix and fire control system. Also, it was based on the assumption that there would be only one model of the F-111. And it was based on the assumption that a much larger number would be produced than was ever approved by the Secretary of Defense.

But now, as you know, we have several different kinds of F-111s. We have an F-111A for the Tactical Air Force, an F-111B for the Navy, an FB-111 for the Strategic Air Forces. There is a reconnaissance adaptation for the Air Force and an F-111 for the U.K. and one for the Australians.

As you introduce new models, tracing with precision the effect on costs gets to be complicated. Some of the components are common with the new models and some of them are not. For those that are not, you have to go back to a new learning curve and make a new cost estimate.

If you look at the 1964 estimates by which time the Programming System was going, you will find they were approximately right. There have been some minor errors to be sure, but the order of magnitude is very small in relation to horror stories like Skybolt, and the changes in cost that have occurred are largely attributable to desirable increases in the capability of the airplane, to changes in the general price level, and to changes in models and numbers to be produced.

Senator HARRIS. That raises some other questions in my mind, but I will defer them for the moment.

TFX AND THE DECISION MAKING PROCESS

Senator JACKSON. For the record, the TFX decision was made in November 1962. You had the techniques in systems analysis available to you at that time, did you not, to make an evaluation to find out where you were going? Would you have gone ahead if you had had some realization that the costs were going to soar like they soared?

Dr. ENTHOVEN. The techniques of cost analysis we use today were in a very early stage of development in 1962. We were just getting going in the Office of the Secretary of Defense. The offices that do this kind of work were very small, and still pretty inexperienced.

The data base on which we had to go was small. So we were really in a very early stage of development by comparison with where we are today. I think we are still in an early stage of development by comparison with where I hope we can go eventually.

As to whether we would have made the decision, I haven't seen any evidence to suggest that we wouldn't have. That is, the Air Force is now getting the plane in combat units, and the Air Force pilots who are flying it are terribly enthusiastic about it. They say all kinds of good things about it.

I don't think there is any reason to suppose we wouldn't have done it.

Senator JACKSON. But the performance characteristics that were laid down at the time have not been met.

Dr. ENTHOVEN. The performance characteristics that were laid down were certainly established before the introduction of Programming and Systems Analysis. I think they were very ambitious, by far

the most ambitious that had ever been projected. They were determined by the military services in 1961 without the kind of careful analysis of need, feasibility, and alternatives we require today.

Senator JACKSON. On the key question of commonality, was there really sufficient information available at that time to predicate the procurement on the basis of commonality?

This, as you know, was the main issue in contention—whether we could get a common plane that would be effective for both services. Obviously, as you have indicated, we have now deviated from that concept in major respects in connection with different service requirements and applications.

As I recall, however, the central issue was this question of a common plane for both services.

Dr. ENTHOVEN. Yes, sir.

As I indicate later in my statement, that decision was not based on systems analysis or cost-effectiveness analysis. It was based on common sense. The Secretary of Defense made another decision along about the same time to get the Air Force to buy the F-4 instead of the F-105. That was a tremendous success.

Senator JACKSON. Yes. I understand about the F-4.

But the TFX is the largest single military procurement in terms of dollars in the history of our Government. The key question at issue was whether a common plane would actually meet the needs of the two Services. Some of us on this committee were involved in those earlier hearings on the TFX.

The argument was made that commonality would save us a billion dollars. That was supposed to be the way we were going to save a lot of money.

It is quite clear that we have not been able to achieve the objective of commonality that was laid down by DOD at the time—nor to make the savings in money that were promised. The estimated cost of the Navy plane is now \$10 million per plane, including support.

My point is: was it not possible in 1961 and 1962 to use the systems analysis techniques—operations research and so on—that were available and that you were using to cancel Skybolt, to ascertain whether or not this approach to TFX was a sound one? That is my basic question.

What has happened is that not only have the costs soared, but there has been the lag, the slippage, in the program—is it two or three years delay for the Navy plane?

I wonder why we couldn't have used the system in this case. Maybe, if we had, some of these difficulties could have been avoided.

Dr. ENTHOVEN. The decision that both Services would use the same basic plane was made by September 1961.

It was based simply on the common sense judgment that the Navy and the Air Force requirements were sufficiently similar and the TFX sufficiently versatile that the Services ought to be able to agree on the same fighter plane, and the F-4 shows that they can.

Senator JACKSON. But systems analysis might aid common sense so that it would really result in eventual good judgment. That is my point.

Senator BAKER. Mr. Chairman, could I say one word in this respect.

I am truly out of my depth, because I have not been involved in the inquiries into the TFX, but it occurs to me that, if even the early beginning stages of this PPB system are valid in concept and design, they should have picked up, even in the early stages of development of the system, the proposition that there were strategic, tactical or technical reasons why commonality would have to be severely modified or would be unacceptable to the Services.

This is the most basic of all considerations in the TFX situation, namely whether it does adapt to the varying requirements of the various Services. This point apparently wasn't picked up. It raises the specter in my mind of whether or not the system, itself, takes into account the military functions of the Services sufficiently as distinguished from the theoretical hardware requirement of the Services.

Dr. ENTHOVEN. I think there is a lot of evidence in favor of commonality.

As I said, the F-4, which we have produced by the thousands, has been a tremendous success for three Services. The Marines use it also.

The Navy and the Air Force are now jointly studying new fighter designs, and now seem to accept the principle that they can benefit from using the same plane.

Senator BAKER. I am not trying to attack the concept of commonality—I favor reasonable applications of the principle of commonality. But I am raising the question of whether or not the system—the chain of judgmental factors that went into the decision-making process on the TFX—properly took into account the capabilities, the performance parameters, the projection of costs and the requirements of the various Services as commonality related to the TFX.

It occurs to me that demonstrably it did not, because it hasn't worked out that way.

Dr. ENTHOVEN. I don't agree.

I think the Chairman made a good point when he said that we should not try to retry the TFX here. But I believe the Secretary's decision to direct a common airplane was sensible.

Senator JACKSON. I wonder if I might clarify one thing.

You have referred to the F-4, the Phantom. In that case, the plane started as a Navy program. The F-4 was a workable plane that could take off from a carrier and get back on the carrier, and carry out a Navy mission. Having achieved that kind of a weapon system then the next step to the use of the plane by the Air Force is not so difficult.

I do not think the TFX situation is really analogous. In the case of the TFX you started with an Air Force plane concept and then modified it to try to put it aboard a carrier. This is the difference, I think, and it is a fundamental one. The Air Force plane design, starting out as a fighter interceptor and later becoming a fighter bomber, called for a rather large plane with characteristics that made it heavy so that it did not necessarily accommodate to an aircraft carrier. It is the weight problem that has given the Navy the most difficulty.

Dr. ENTHOVEN. As I understand it, Mr. Chairman, both the Air Force and the Navy were designing planes and they were instructed to get together and make a single design that would be suitable for both.

The Air Force wanted a fast fighter-bomber and the Navy wanted a Fleet Air Defense plane. Their requirements were very similar, with short field performance for the Air Force equating to carrier operation for the Navy, long Air Force ferry range equating with long Navy loiter time, and so forth.

Senator JACKSON. But the Phantom did not originate like the TFX. You had a workable carrier plane to start with in the case of the F-4.

Dr. ENTHOVEN. That is correct.

Senator JACKSON. In other words, you had a workable Navy plane, which the Air Force then adopted. The big headache in this effort to get so-called commonality and to get a common TFX plane stems from the fact that you really started in the design stage to get a common aircraft, but it was primarily an Air Force effort—certainly in quantitative terms since they were to get a much larger number of the planes. The Air Force is doing the basic R. & D. and it is the executive agent of the Defense Department in the procurement of both the Air Force and the Navy plane. I merely make this observation.

If the TFX had been operational aboard a carrier and then you proceeded to say to the Air Force, "Look, this is a weapon system that you ought to take", I would agree in that situation with the analogy to the F-4.

Dr. ENTHOVEN. The A-7 is a similar case, a plane developed by the Navy and then found by the Air Force to be suitable for their purposes. But I think, Mr. Chairman, that if we tried to sell the Air Force on the proposition that in the future they should let the Navy develop all their planes, we would have a hard time persuading them.

Senator BAKER. Mr. Chairman, I would like to clarify the thrust of my earlier questions so that there is no misunderstanding about them.

I am not criticizing the idea of trying to design a plan for all Services and all countries allied with the United States. I am raising the specter of a defect in your planning system when demonstrably and obviously the planning did not take into account the most basic needs and requirements of the various Services, the Navy in particular, in the design of this machine.

This isn't criticism of TFX. It isn't criticism of the Army, Air Force, or Navy. It is a question about the design efficiency of the system which analyzed the problem and led to the judgment.

Dr. ENTHOVEN. Senator, I am handicapped by not having as much knowledge and experience as you in that particular area.

[Laughter]

Senator BAKER. You are in bad shape. That is the most distressing news I have heard.

[Laughter]

Dr. ENTHOVEN. The points that you claim to be obvious are just not obvious. The points you are talking about are terribly complex matters of judgment on which reasonable men can differ. But I can assure you that the Navy has in the past year carried out a detailed, extensive evaluation of the F-111 versus all other possible approaches, and has come to the conclusion that for the job of Fleet Air Defense for which it was intended it is the best choice.

So I think that the assertions that you made about it being obvious that the planning didn't take into account the Navy's needs, are just not true.

I think you can ask the Secretary of the Navy or the Admirals who did the study and they will tell you that. It was debated, and the reason it was debated is because it is very complex, and informed men can differ in their judgment. But that was the consensus of the Admirals doing the study.

Senator BAKER. I agree with you that people might differ in this respect, but in defense against your categorical allegation that my comments are simply not true, I would respectfully point out that there have been material and substantial modifications in the TFX to accommodate the Navy and Air Force purposes.

This demonstrates the fact that at least to that extent the concept of commonality wasn't effective in the planning and design stage.

This is a point, as you properly state, we have not the time or jurisdiction to explore in detail here.

Senator JACKSON. Senator Mundt.

Senator MUNDT. As long as we are talking about an old friend like TFX, when you say that common sense determines that commonality would be a good objective, I think everybody could agree with that. But the exercise of common sense in the Defense Department, if that is all we are going to use, is something which I would hope has always been present among the administrators of the Defense Department.

Dr. ENTHOVEN. I agree with that.

Senator MUNDT. As I understand it, you are injecting something which is to check on common sense, namely, the cost effectiveness system.

Dr. ENTHOVEN. Yes, sir.

Senator MUNDT. In the evolution of this TFX problem, the common sense thing to do was what they did. They had this commonality concept and during 1962 they subjected it to Evaluation Groups, from the user Services, saying, "How does this concept of ours work in your opinion?"

Three times the Evaluation Groups rejected it. That was common sense conflicting with the common sense objective.

It seems to me that at that stage your system must have come into action to overrule the common sense determination of the three unanimous Evaluation Groups, to say, "In spite of that, our system shows that it can be done and can be done at a certain price." Then you would explain why the systems analysis went wrong as far as costs are concerned. That, I think, is more readily understandable than why it went wrong with respect to the performance element.

It is good to hear you say that you believe that the Air Force is satisfied and that we have an Air Force version of TFX, the F-111A, which fliers are enthusiastic about and which will soon be in combat units. I hope that is right. Our Appropriations Committee, acting on that kind of testimony, put in the money to build the planes.

What I can't understand is why systems analysis—if we accept for the sake of the discussion, in absence of any proof to the contrary, that the Air Force version is going to be effective and acceptable—why would the system go so completely wrong on the Navy version, where there seems to be no substantial disagreement that you have failed completely to approach the optimum goals desired in the Navy version?

Why would your system, if it worked in the Air Force version, completely fail in the Navy version?

Dr. ENTHOVEN. If I can take the points you raise in turn, Senator, first of all I certainly agree that our predecessors in running the Defense Department had a lot of common sense.

Secondly, it is not my understanding of the facts that the Evaluation Groups didn't believe that the Services could use the same plane, but I am not acquainted in detail with the facts of the case there.

Senator MUNDT. Maybe they didn't say they couldn't use the same plane, but they did say they couldn't use the version which was later accepted, the General Dynamics version.

Dr. ENTHOVEN. No, I know that is not correct.

Senator MUNDT. That was the one they rejected.

Dr. ENTHOVEN. The Evaluation Group and General LeMay and Admiral Anderson, all agreed that either model would be acceptable to both Services. But the main point—

Senator JACKSON. That was only on the *third* go-around of the Evaluation Group. But it was not the case on the first two go-arounds.

Dr. ENTHOVEN. The final evaluation indicated that either version would be acceptable to the needs of both Services.

Senator MUNDT. I think if you go back and read the hearing record, you wouldn't find General LeMay and Admiral George Anderson saying that they were satisfied.

Dr. ENTHOVEN. They said that either plane was acceptable to the needs of both Services. They indicated they preferred Boeing.

Senator MUNDT. I can remember General LeMay reaching out his hands as he testified: "If it is only 12 inches or 12 feet, against the opposition, it is a matter of life and death."

Dr. ENTHOVEN. If I can get back to the concerns of this committee, I do think it is important to say, first, that the systems analysis approach that we are talking about now really was not in operation when most of the decision making on TFX was done. That is one point.

The other point is that the Secretary of Defense, the Service Secretaries and the other top officials of the Department are not aeronautical engineers. The top officials must make the broad decisions about such aircraft programs and then it is up to the aeronautical engineers.

I don't think it is true to imply that the F-111B has been a failure. The Navy thinks it is going to turn out to be a good, effective plane. They are having their technical difficulties, but many of the planes we have developed that eventually turned out to be good went through such a phase. It is really quite an overstatement to say "success" in one case and "a total failure" in the other.

Senator MUNDT. I don't know whether it is an overstatement, Doctor, when we talk about "success" in contrast to "failure." But there is a great disparity. We are closer to success, let us say, with the Air Force version, and we seem to be much further from success in the Navy version.

I would think if the system was operating effectively it shouldn't come up with a boo-boo.

Dr. ENTHOVEN. I don't think it did.

Senator JACKSON. In connection with your reference to the aeronautical engineers, I think it should be said that the Evaluation Group, as you know, had top aeronautical engineers, most of them civilians,

who were involved in this. These engineers were in dispute with the civilian secretaries as to the evaluation, as to what the plane would do and what it would not do. I believe I am correct in that. It is a matter, of course, which the record will speak to. I wanted to observe that the technical people did take a contrary view.

Senator MUSKIE. Mr. Chairman.

Senator JACKSON. Senator Muskie.

Senator MUSKIE. I did not intend by one question to interrupt the continuity of the statement to this extent.

Having been involved in the TFX hearings myself, Doctor, I have recollections of what happened at that time. As I recall, the principal thrust of the hearings was to evaluate the wisdom of the choice that was made of the General Dynamics version as against the Boeing version, and the two versions were compared on a number of counts, including commonality.

I don't recall that the objective of commonality was challenged in the hearings. There was disagreement as to which of the two versions had the greater potential for achieving the objective. This factor was one of several that the committee explored in an attempt to second guess the decision that had been made to go with General Dynamics rather than Boeing.

I don't recall the objective of commonality was challenged at that point.

Senator JACKSON. At that point I think the questions that were raised related to whether or not it would be possible to achieve the kind of commonality that had been set as a goal and still have an operational and effective Navy and Air Force plane. I believe that is what we took a lot of testimony on.

Senator MUSKIE. But I don't think the Secretary of Defense or anybody else guaranteed beyond question a plane would be developed, either General Dynamics or Boeing, that would meet the objective as fully as it was hoped it might. I don't think that guarantee was offered by anyone.

WERE SYSTEMS ANALYSIS OR PPB USED IN TFX?

Dr. ENTHOVEN. Mr. Chairman, I think the main point I want to make, which might end this, is that the TFX decisions we are talking about and PPBS, really have practically nothing to do with each other.

I don't think it is really a good test case. Many other issues got involved in the TFX, and the Programming System was not close to being in full operation until after the key TFX decisions were made.

Senator BAKER. I also don't want to prolong this. Believe me I am not trying to get into a weighing of the merits of the TFX. I am trying to limit my queries or suggestions to the subject under question, and that is the effectiveness of PPBS.

I am trying to use the TFX only as an example or as a guideline to test this.

Let me ask you this, if I might: When did PPBS become policy or when was it implemented by the Defense Department?

Dr. ENTHOVEN. I would say not before the fiscal 1964 budget.

Senator BAKER. I would like a calendar date.

Dr. ENTHOVEN. It was phased in gradually. I would say it was not close to full operation before calendar year 1963. That would be a good time to say that it was substantially implemented.

Senator BAKER. By January 1963 it was substantially in full operation?

Dr. ENTHOVEN. Yes, sir.

Senator BAKER. When was it initiated or when was it started?

Dr. ENTHOVEN. The first five-year program was circulated in draft in the fall of 1961.

Senator BAKER. When was the draft put into effect, even in preliminary form?

Dr. ENTHOVEN. It was for the fiscal 1963 budget.

Senator BAKER. Does that mean in July 1961?

Dr. ENTHOVEN. July 1962.

Senator BAKER. July 1, 1962, was when PPBS in its most primitive form was first implemented in the Defense Department?

Dr. ENTHOVEN. Yes.

Senator BAKER. When was the determination made on the TFX?

Dr. ENTHOVEN. There was a continuing series of decisions on the TFX that started before Mr. McNamara became Secretary of Defense in January 1961, decisions by the Services as to what their requirements should be, etc. The Air Force announced its requirements in 1960. Secretary McNamara decided there would be a joint Air Force-Navy program in September, 1961. The decision to award the contract to General Dynamics was announced in November, 1962.

Senator BAKER. The point I am trying to get to, Doctor, is whether or not PPBS in even its most primitive or earliest forms, was applied as a theory or technique to the final judgments or to any judgments in connection with the decision to go ahead or not to go ahead with TFX.

Dr. ENTHOVEN. The answer is no.

Senator BAKER. And PPBS, then, was never used as a vehicle for making judgment on the desirability of the TFX?

If that is so, then my questions heretofore are not relevant because it simply means that the example of the TFX doesn't help me judge the effectiveness or the usefulness of PPBS.

Dr. ENTHOVEN. Right.

I think that is the right conclusion. Of course the ideas that make up PPBS were introduced gradually. It is not as if one day we didn't have it and the next day we did. But I agree that the judgment with which you just concluded is correct.

Senator BAKER. I suffer from the fact that I don't recall the sequence of events and had no direct exposure to them. But it seems to me that the first proposal for the five-year projection, as you say, substantially predated the time when we made a determination on TFX.

Am I incorrect in that respect?

Senator JACKSON. I think the Request for Proposals on TFX went out in December 1961. There was a series of evaluations, leading up to the third one, that took place during calendar 1962. The final judgment or decision was made by the Secretary of Defense in mid-November of 1962.

Senator BAKER. This is the point I am trying to get at: Since the final determination was made, say, in November 1962, were the tech-

niques of PPBS brought to bear in arriving at this final decision in November 1962?

Dr. ENTHOVEN. The answer is no.

COST-EFFECTIVENESS AND THE NAVY F-111B

Senator MUNDT. Let me supplement this discussion by asking: Since the decision on the TFX was made and construction began, and the request was made to Congress for production line appropriations for the Air Force version and the Navy version, have the procedures of PPBS been employed at any stage in the game in helping the Defense Department determine whether or not to ask for production line money for the Navy version of the TFX? We are now way along in 1967.

Dr. ENTHOVEN. Yes. The Navy has done at least one extensive, thorough cost-effectiveness study of the TFX or the F-111B. As I indicated earlier, they concluded that for the mission for which it was intended and in the time period that is relevant to it, the F-111B is the best plane that can be obtained to do that job.

Senator MUNDT. So that it would be fair to say that the eventual outcome of the Navy plane—how the F-111B works out—would now be a fair test of the effectiveness of the system? You are using PPB now when you come to us for money for production line—

Dr. ENTHOVEN. I am trying to make very clear—

Senator MUNDT. Let me finish my question.

You come to us now in the Appropriations Committee in good faith asking for money for production line use for the Navy version. The Appropriations Committee, with equal sincerity, has said, "We don't think it is going to work." We are using common sense and you are using PPB and cost effectiveness. You are using Systems Analysis.

I think it is a very fair thing to say that a very honest, a very dramatic, and a very significant test of the value of the cost effectiveness system is going to depend upon the eventual outcome of what happens to the Navy plane. You speak very hopefully about it. I am kind of pessimistic about it, myself.

But the future will determine it. I think it would be a fair thing to say, then, that that is also a test of the system.

Dr. ENTHOVEN. Senator, I have tried to make clear that we are not claiming that PPBS is a magic wand. I certainly don't want to claim that it is an aeronautical engineering system. When you go back and try to analyze the final history you ought to use some judgment as to what the reasons for success or failure were. Whether a good or a bad job of aeronautical engineering is done at some point, doesn't necessarily prove that the management system is good or bad.

Senator MUNDT. Yes, Doctor, because the management system if it works, and if the plane is a failure, should come up with the judgment that we shouldn't continue a bad guess.

You have built a pretty good case that your system back there in its swaddling clothes wasn't a determining factor in making the choice. I accept that.

But from 1962 to 1967, there have been repeated requests by the Defense Department to do certain things with the Navy version. It seems to me if the Navy version turns out as well as you hope, this proves that the system came up with a good answer.

If the Navy version does not pan out, then it seems you have come up with a bad answer. If your system works, you should have checked and evaluated these expenditures someplace along the line.

Isn't that fair?

Dr. ENTHOVEN. Yes, but what you said earlier is not fair. What you are saying now is that the eventual success or failure of the F-111B will show in this particular case whether or not PPBS led to a good decision. But I am not saying it necessarily comes up with a good decision in every case. Moreover, I think that by talking about the F-111B all the time you are giving a very biased, unbalanced picture of PPBS. You are taking just one particular case. Why not talk about the B-70, for example?

That was a very controversial decision. It was recommended to the Secretary of Defense that he go ahead and put the B-70 into production. We could have wasted \$15 billion on the B-70. Everyone now agrees that had we gone ahead with the B-70 it would have been a terrible waste. The Air Force is very clear that the B-70 is the wrong plane and would have been the wrong plane at that time. Let us talk about that decision.

Or let us talk about the Skybolt. A month after it was cancelled, everybody agreed that the Secretary of Defense did the right thing, that Skybolt would not have been a good weapon system.

Or why don't we talk about the Nike-Zeus. Many people wanted the Secretary of Defense to go ahead with the Nike-Zeus in 1961 and 1962. That was a very controversial decision. We could have wasted \$15 or \$20 billion on Nike-Zeus had we gone ahead with it. Actually, I worked on the analyses leading to the B-70 and Nike-Zeus decisions. PPBS and Systems Analysis had a lot to do with them.

In fact, for a while, the Systems Analysis office was working on practically nothing but the B-70.

If you look at the whole sweep of decisions, I think you would see that there were a lot of decisions that, while controversial at the time, have very clearly shown up subsequently to be the right ones.

Senator MUNDT. I wouldn't deny that at all.

Dr. ENTHOVEN. Everytime you think of TFX, let us talk about the B-70 at the same time.

Senator MUNDT. That is quite proper, to do that. I will just make two comments.

The reason we talk about TFX is because it is the biggest single military procurement contract in the history of the country.

Dr. ENTHOVEN. It wouldn't have been as big as the B-70 if McNamara had followed the almost unanimous vote of the Congress to go ahead with the B-70. We would have ended up spending more money on that, or on Nike-Zeus.

Senator MUNDT. It is the largest single procurement contract we have gone into, let us put it that way.

The difficulty with a system which sometimes works and sometimes doesn't work is like me trying to hire an administrative assistant and his saying, "I will tell you the truth 90 percent of the time." I can't use him.

Dr. ENTHOVEN. Nobody is claiming infallibility. If your assistant got up here and claimed he had an infallible system, he should be

thrown out. The record contains many of my statements, saying that nobody is claiming perfection. We are only claiming that this system helps and gives us better odds.

But, in the case of the TFX, I do want to make it clear that the Air Force version is flying well. I think the returns are not yet in on the Navy version. There is no point arguing the Navy version now. We should wait for five years. If by then it turns out that it was a bad decision, then you would be justified in saying that our decision to go ahead with it was one that didn't work out well. If it is successful, then that is something else.

But I do want to make it clear that no management system is going to get a 100 percent batting average.

WHY WAS SYSTEMS ANALYSIS NOT USED IN TFX CASE?

Senator JACKSON. In connection with the B-70, let me just observe that I did not favor series production of this plane. And Congress did not authorize commencing series production of the B-70. It did authorize some funds for long lead time procurement and for prototypes, and the prototypes have proved an invaluable source of much-needed supersonic flight information for an advanced intercontinental supersonic bomber as well as for commercial supersonic transport.

I think the main point that is involved in this dialogue that we have had this morning since the Secretary has departed from his statement in response to a question initially asked by Senator Muskie, relates to the question of why systems analysis was not used in the TFX matter. At least my questions have not been critical of systems analysis, if carefully utilized.

On the contrary, I think one can make the reverse argument that maybe if we had used systems analysis in connection with the TFX, some of the problems that we are now experiencing and have experienced since the procurement got under way might have been avoided. This might have been systems analysis' greatest triumph.

I think the real question here is why systems analysis wasn't used before the key TFX decision was made in November 1962.

Senator METCALF. As I understand, Mr. Chairman, the question not only is that, but the questions have demonstrated that it was not completely underway or available for use at that time, but had we had the same issues before us today we might have arrived at a different solution.

Senator JACKSON. Techniques of systems analysis were available then and, as we have been told this morning, they were being used during this same period in the fall of 1962 in deciding to cancel Skybolt.

I think you will find that Mr. Hitch was not consulted at all in connection with the TFX matter.

Dr. ENTHOVEN. I believe that is correct.

Senator JACKSON. Mr. Hitch told me so.

Dr. ENTHOVEN. I believe it is correct that we were not involved in that.

I don't want inadvertently to be accepting the reverse implication of your question, Mr. Chairman. It is a "when did you stop beating your wife?" kind of question.

Senator JACKSON. No. I said "maybe." Systems analysis might have been useful in avoiding some of these things. I didn't say it would have been.

Senator BAKER. Could I say this, Mr. Chairman?

I am afraid it is repetitious to the third degree——

Senator JACKSON. This is not a third degree.

[Laughter]

Senator BAKER.—but my purpose of inquiry about the TFX was to test the validity of the PPBS technique against a known problem, in performance and results. The witness has to a substantial extent, invalidated the comparison by identifying the dates and the state of the development of the art.

I am tempted to ask, and I think I will ask, whether you would be willing to speculate on what the variation, if any, in the final determinations on the TFX might have been had the current state of the art in PPBS been applied to the situation as we knew it when the TFX judgment was made.

I don't know whether you want to answer this question or not, but I would be interested in hearing your answer.

Dr. ENTHOVEN. I think I would only risk adding to the confusion by speculating on that.

Senator BAKER. Would there have been some difference in the evaluation of the project and a stimulation of additional inputs on which judgments might be made had PPBS been fully implemented at the time the TFX judgment was made?

Dr. ENTHOVEN. Let me answer it this way, Senator: I think that as the result of seven years of hard work, including recruiting and training better analytical personnel, improving the information gathering procedures, et cetera, today we would be able to do a better job of planning and deciding that, or any other weapon system choice, than we were able to do in 1961 and 1962.

I think any fair minded observer of the Pentagon scene would agree to that statement.

Senator BAKER. I thank you for that. I thank you for responding to a very hypothetical question. I only want to add in conclusion I am not trying to crucify you or the Secretary of Defense. I am not trying to crucify or indict PPBS. I am trying to establish a usefulness relationship between a known project and a system that is now under examination.

Senator MUSKIE. May I say, Doctor, as soon as I asked the question about Skybolt, I made a mental bet with myself that this would lead to a discussion of TFX.

Senator BAKER. And as you usually do, you won.

Senator JACKSON. Dr. Enthoven, would you now proceed with your statement.

CENTRALIZATION OF DECISION MAKING

Dr. ENTHOVEN. The Planning-Programming-Budgeting System has provided the Secretary of Defense with some of the tools he needs to make major strategic decisions and to see that they are carried out. After careful consideration of the advice of the Joint Chiefs of Staff, the Services, and his civilian advisors, the Secretary of Defense decides

what the Department's recommendations to the President and the Congress will be.

I am convinced that there is no sensible alternative to centralization of the major strategic decisions. They were decentralized before 1961 and the result was clearly unsatisfactory. The Army was trying to prepare for one kind of war while the Air Force was trying to prepare for another. The result was that we could not effectively fight either kind of war.

Centralization of these decisions has not led to a Defense program based on a single view of strategy or a single vision of the future. On the contrary, PPBS has helped to improve the ability of the Joint Chiefs of Staff and the Services to comment on, and to debate thoroughly, the totality of our military posture in order to make their contributions to insuring that it can deal effectively with a wide range of contingencies.

Moreover, it is not entirely coincidental that the introduction of PPBS was accompanied by a major change in military strategy. Since 1961, we have moved from a rigid, inflexible reliance on the threatened massive use of nuclear weapons to the strategy that has been characterized as "flexible response." This latter strategy includes balanced, ready forces that are able to deal appropriately with aggression at each point across the broad spectrum of warfare from anti-guerrilla war to thermonuclear war. The themes, "options," "flexibility," and "choice," have become as fundamental to our military strategy as they have been to our approach to analysis and planning of the defense program. The charge that centralized decision making leads to an inflexible strategy based on a single set of assumptions is refuted by the historical facts.

Has the greater centralization of decision making and control made it easier for the Office of the Secretary of Defense to suppress dissent or to ignore opposing arguments? I don't think anyone who reads the newspapers will believe that dissent is suppressed in the Department of Defense. There is plenty of debate now; but I like to think that it is now enlightened by more information and analysis and more sharply focused on the important policy issues than it was a decade ago.

Does PPBS help the Secretary or his staff ignore opposing views? It does not. In fact, just the opposite is true.

I remember well the experience of an Admiral who worked for Secretaries of the Navy in the program decision process before and after 1961. When one of Secretary McNamara's first "Draft Presidential Memorandums" on Naval Forces was sent to the Navy for review and discussion, some of the Admiral's colleagues reacted negatively to the idea. They did not accept some of the Secretary's assumptions and they did not agree with some of his conclusions. They questioned why the Secretary should be sending such a document. My friend's reaction was: "No, no, don't try to make him stop sending these drafts. All we got from previous Secretaries of Defense was the decision, without explanation or analysis. McNamara sends us his analysis, assumptions and all. If we don't agree, we've got something to attack and if we can prove him wrong, he'll change his mind."

The fact is that the Secretary of Defense sends drafts of all important program decision documents to the Joint Chiefs of Staff and to the

Service Secretaries for review and comment before he makes up his mind. Rather than suppressing dissenting points of view, his procedure "smokes them out" and gets them out in the open where they can be analyzed and discussed. The PPBS procedures we use encourage the expression of opposing views, and the result is better analyses.

ACHIEVEMENTS OF PPBS IN THE DEPARTMENT OF DEFENSE

PPBS has led to a major and general improvement in the quality of the decision and planning process in the Department of Defense. It has also led to a major improvement in the quality and relevance of debate over requirements issues. The Secretary of Defense, the Joint Chiefs of Staff, and the Services have more and better data on the effectiveness and costs of alternative programs.

Many studies have been done, and others are underway throughout the Department on each major force requirement issue. Procedures have been established so that these studies can be followed and reviewed in an open and professional way by the Office of the Secretary of Defense, the Joint Staff, and the Services.

PPBS provides an official force plan which gives the planners and analysts in the whole Department a firm foundation for their planning and a solid point of departure for their analyses. Now the procurement, facilities, and personnel branches can be confident they are providing equipment, facilities, and manpower for the same forces, thus greatly reducing the confusion and waste that occurred when there was no unified, approved plan as the basis for these activities. Today we have a firm force structure base from which to analyze the additional effectiveness and cost of new programs. The left hand has a better idea of what the right hand is doing in force and financial planning.

By unifying programming and budgeting, PPBS has closed the "gap" between force and financial planning. This has led to the acquisition of ready, more balanced, and better supported combat forces. There have been the inevitable difficulties in detailed execution, and I do not doubt that one could find minor examples to the contrary. But, for the most part, since instituting PPBS, the forces that have been authorized and approved by the Secretary of Defense have been procured together with the manpower, equipment, facilities, etc., necessary to make them balanced and combat ready. The systematic viewing of all requirements on an overall basis, rather than on the basis of a single Service, has led to the elimination of much unnecessary duplication.

One of the results of PPBS has been the development of unified analyses of requirements for Strategic Offensive and Defensive Forces and the Airlift and Sealift Forces. I believe that these developments are quite important and representative of what the system can achieve.

We have come a long way since 1961. I remember a briefing presented at that time to the Secretary of Defense by the Navy on requirements for Polaris submarines. The briefing began with a list of targets, a calculation as to how many missiles should be programmed per target, how many were needed on-station, how many were needed in the total force to maintain that number on-station, and

thus why a force of 45 Polaris submarines was needed. In the entire briefing there was not one reference to the existence of the Air Force or its weapon systems, despite the fact that most of our thermonuclear firepower was in the Air Force. Also, the briefing did not mention alternatives and gave no estimate of the consequences of buying, let us say, 40 or 50 instead of 45 submarines. More important, the briefing gave no indication that would be meaningful to the generalist of the significance for the United States of an ability to destroy those targets. Air Force briefings, at the time, had similar shortcomings. Let me emphasize that I intend no criticism of the men doing these analyses; many of them were excellent. Rather, I am pointing out specific deficiencies that were forced upon them by the lack of a framework such as that provided by PPBS.

In 1961, Secretary McNamara asked a group of military planners to study strategic offensive force requirements for the next ten years. I worked with them as an observer and friendly critic. The group displayed a very high degree of professional competence, and the study was by far the best that had been done on that subject to date. The study group developed a list of all strategic targets and, using the best available intelligence and their own judgments, projected the growth of these target lists over the next ten years. They then estimated the performance and operational characteristics of the various available weapon systems and calculated how many would be needed for destruction of 75 percent and 90 percent of the targets in each of the next ten years. These calculations were summarized and forwarded to the Secretary of Defense.

The study was excellent, but it raised many more questions than it answered. Why 90 percent or 75 percent? What were we really trying to do? What was the purpose of having the power to destroy these targets, not in terms of the narrow technical criteria of the force planner, but in terms of broader criteria of interest to the Secretary of Defense, the President, and the Congress? The study had other limitations. For one thing, it treated only strategic offensive forces and gave no indication of the relationship of strategic offensive to strategic defensive forces. Moreover, it assumed the Soviets would not react to major changes in our own forces.

I point to these limitations not to criticize those who did the study; I was one of them. My purpose is to indicate the state of the analytical art at that time. Since then a great deal of questioning, debate, exploration, study, calculation, and research have illuminated many of these questions. First, as to criteria, we asked: What national purpose is served by being able to destroy those targets? There were two purposes. The first was deterrence. By having the power to destroy Soviet society in a retaliatory strike, we hope to deter the Soviets from attacking or threatening to attack us. The second was that the power to destroy bomber bases and missile sites might reduce the amount of damage that Soviet forces could do to us in case of a nuclear war. The first criterion we now call Assured Destruction; the second, Damage Limiting.

Then it became clear that strategic offensive forces bought for Damage Limiting needed to be compared systematically with strategic defensive forces bought for the same purpose. It would make no sense,

for example, to spend an additional \$10 billion on strategic offensive forces, primarily for Damage Limiting, if we could save the same or a greater number of lives by spending a billion dollars on fallout shelters. Thus, we developed methods for integrating the treatment of strategic offensive forces and strategic defensive forces.

Next, we observed that the U.S. anticipates and reacts to Soviet moves such as their deployment of an anti-ballistic missile defense system. So we began exploring the implications of various assumptions about how they might react to our moves.

Of course, the effectiveness of different combinations of systems will vary a great deal depending on the assumptions about how the war starts, how it is fought, how each side responds to what the other side does, and many other uncertain factors. So, the analytical procedure must be developed in such a way that the assumptions can be varied and the implications of different assumptions explored.

Now, after six years of steady work on this problem, we have an agreed set of numerical representations of the outcome of nuclear war under alternative assumptions. Basic contributions to the development of these models have been made by all components of the Department of Defense: by military planners in the Service staffs, by study groups in the Joint Staff, by the Joint Strategic Planning Staff, and by the Office of the Secretary of Defense. Today, the experts are all pretty much in agreement on how you go from any single set of assumptions to the results those assumptions produce. This makes it possible for the top level officials, who are not themselves technical experts in nuclear planning, to understand which assumptions are important and to concentrate their attention on the crucial judgments.

A similar development has occurred in the analysis of our Strategic Mobility Forces—our Airlift, Sealift, and prepositioned Army equipment, the facilities required for them to function, and the forces that they must move. We can now examine them in an integrated way, instead of treating lift forces and land and air forces to be moved by them as separate and unrelated activities. We have a numerical representation of the world wide rapid deployment problem. Under any set of assumptions about how the war starts, where we want to go, what forces are to be deployed, etc., we can calculate what combination of airlift and sealift would allow us to deploy the needed forces at the least cost. These models are now used regularly by study groups in the Military Departments, the Joint Staff, and my office. They form the basis for continuing study and discussion about force and procurement planning. As a result, the Congress can be confident that the various elements of our strategic mobility posture are being planned and procured in balance. The fact that we can examine the posture under each of a broad range of assumptions means that we are able to assure ourselves that we are buying a very flexible posture, one that can perform well under a wide range of conditions.

The Navy and the Office of the Secretary of Defense are now working together to develop a similar unified approach to requirements for the various components that make up our posture for anti-submarine warfare: the attack submarines, the destroyers, the sonars, and the land and sea based patrol aircraft.

The utility of PPBS in planning and evaluating the General Purpose Forces has been questioned. In 1961 we had unbalanced General Purpose Forces that were preparing for different wars. The Air Force tactical air forces had practically no modern conventional ordnance because they had been preparing for a short nuclear war. In principle, the Army was being built for a long war, but its inventories were down to a few days of supply of some kinds of ammunition and equipment, while it had more than a year's supply of others. Because the land and tactical air forces were being planned for different kinds of wars, they were not ready to fight either. That is what overly decentralized planning can do for you. We need to be able to fight both conventional and nuclear wars. Having the Air Force prepare for a nuclear war, while the Army prepares for a conventional war, is clearly not the way to provide this flexibility.

By 1965 we had balanced, ready forces, procured and planned against a unified set of logistics readiness standards whose purpose was to help us insure that these forces could jointly fight a wide range of possible wars.

The Planning-Programming-Budgeting System in the Department of Defense has played a useful role in some very significant improvements in our force structure. Between 1961 and 1965 our strategic offensive forces were transformed from soft, concentrated, vulnerable systems to diversified, well-protected, relatively invulnerable systems. During that time the number of weapons and megatons in our strategic alert force tripled. PPBS contributed to the efficient and effective planning of this transition.

Since 1961 we have achieved a major increase in the quality, size, and readiness of our tactical air forces. From 1961 to 1967 the payload carrying capability of our active tactical air force more than doubled, and our inventories of modern conventional ordnance increased greatly even before we entered the war in Vietnam.

Our Land Forces have also benefited considerably from improved planning. The Army has now for the first time defined complete division forces, i.e., divisions together with all of the combat and service support units required to make them fully effective forces. Through PPBS we now see to it that decisions to add divisions to the force structure lead to complete balanced division forces with a known and stated degree of combat readiness.

Perhaps the most significant innovation in land forces in this decade will prove to be air mobile warfare. This was the invention of imaginative and progressive military officers. Its testing, evaluation, and speedy introduction into the force structure received the very strong and active encouragement and support of the Secretary of Defense. Systems analysis played a positive role in this innovation. It brought the possibilities for enhanced military effectiveness to the attention of the Secretary of Defense; it provided the basis for some searching questions by the Secretary which got the air mobility concept top-level attention. It helped the air-minded Army officers to give numerical expression to some of the benefits they considered important, but that had previously gone unmeasured. Thus, when the time was ripe, it was possible to add a balanced, well-designed air mobile division to the force structure quickly.

Between 1961 and 1967 our strategic airlift capacity more than quadrupled. One of the main reasons for this has been the revolution in the technology of air transport which has made it possible for us to buy large, highly efficient jet cargo aircraft. But a key role in this innovation was played by the systems analyses done in the Joint Staff, the Services, and the Office of the Secretary of Defense. These studies showed that a large gain in military effectiveness could be achieved, in cases in which our allies were suddenly attacked, if we could move our forces to the combat zone very rapidly, and reinforce and defend in forward positions. These studies confirmed what common sense and history tell us. In World Wars I and II and in the Korean War, we lost many lives in the painful and time consuming process of digging the enemy out of positions that he had occupied early in the war. Had we been able to deploy our forces rapidly and stop the enemy farther forward, the wars would have been much less costly. Although rapid deployment makes sense, detailed numerical analyses are necessary to help the Secretary of Defense, the President, and the Congress decide *how much* rapid deployment capacity is needed.

HAS PPBS LED TO UNWISE DECISIONS?

Decisions of the kind we are discussing turn in large part on judgments about questions of value and uncertain or unknowable facts. Nobody claims that PPBS *automatically* produces good decisions or that all the decisions aided by PPBS have been good ones. I am merely *suggesting* that PPBS has proven to be a useful tool which can help the decision maker.

Your *Initial Memorandum* uses rather strong adjectives to attack two controversial decisions. First, it says "The PPB approach was used to justify the purchase of a \$277 million oil-fueled aircraft carrier that was obsolete before it was launched."¹⁰ As you know, the story is a little more complicated than that statement implies.

First, the aircraft carrier in question, the John F. Kennedy, was originally approved by the Congress as a *conventional-powered* ship.

Second, the contribution of PPBS to the decision was quite limited. As I recall, the rather simple point was made that the key judgment was not whether a nuclear-powered carrier is better than a conventional-powered carrier, cost not considered; the key judgment was whether the extra effectiveness provided by nuclear power was worth the approximately \$150 million increase in cost, or whether the \$150 million would yield more effectiveness if spent in some other way. This question is a matter of opinion on which informed men of good judgment can differ.

To assert however, as the *Initial Memorandum* does, that the John F. Kennedy is "obsolete" is unjustified. The John F. Kennedy will carry the most modern weapons, aircraft, and electronic systems. It will perform its missions at a much lower cost and, for most contingencies in which it would be employed, at no reduction in effectiveness. The North Vietnamese won't be able to tell the difference between an attack sortie launched by the Enterprise and one from the JFK.

Second, the *Initial Memorandum* says "Also, a perversion of cost-effectiveness was used, after the fact, in the largest single military

aircraft contract in history, to rationalize the choice of an airplane whose costs are soaring, if not its performance.”¹¹

Does a “perversion of cost-effectiveness” mean an analysis whose assumptions the author does not agree with?

The phrase “choice of an airplane” is ambiguous. There were three basic decisions that went into the F-111. The first was a decision on its performance requirements. That was largely completed by the Military Services prior to 1961, certainly prior to the effective implementation of PPBS. The second was a decision, by Secretary McNamara, that the Navy and the Air Force would build the same basic aircraft. That decision was not based on a cost-effectiveness analysis; it was based on common sense. Our experience with the F-4 shows that the Navy and the Air Force can use the same fighter plane very successfully and with great savings in cost. The third basic decision was the choice of a contractor. On the final scores of the Evaluation Group, the General Dynamics proposal came out ahead. General LeMay and Admiral Anderson preferred the Boeing proposal, but concluded that either contractor’s proposal would meet the needs of both Services. The Secretary of the Air Force, the Secretary of the Navy, and Secretary McNamara went along with the technical experts of the Evaluation Group because, based on their experience and in their judgment, the General Dynamics proposal offered a better chance of producing an acceptable aircraft at less cost and technical risk. As to the “soaring costs,” it should be recognized that the costs set forth in the original proposal did not purport to cover the complete multi-model program as it now exists; moreover, Mr. McNamara made it clear at the time that he did not believe those cost estimates to be realistic.

I am not aware of any perversions of cost-effectiveness entering into this; I don’t believe there were. I am aware of a Navy “cost-effectiveness” study, done within the past year, that found that the F-111B remains the best way, in the relevant time period, to do the job of fleet air defense for which it was intended.

These two decisions were very controversial and are likely to remain so for some time, mainly because they were close ones, within the range of uncertainty. The intensity of feeling they generated was way out of proportion to their importance. But the *Initial Memorandum* leaves a biased impression by limiting its discussion to them. Why not include a discussion of the B-70? Secretary McNamara’s decision not to put it into production was hotly controversial at the time. But surely all the experts now agree that the B-70 was definitely the wrong kind of aircraft. We could have wasted \$15 billion on it if Secretary McNamara had made the wrong decision. Why not discuss the Nike-Zeus? Had the Secretary of Defense gone ahead with it in 1961 or 1962 as then proposed, it would have been ineffective by the time it was installed. We could have wasted \$15 or \$20 billion on it if Secretary McNamara had made the wrong decision. Why not mention the Air Mobile Division and the encouragement Secretary McNamara gave to Army air mobility? (I am referring to the Howze Board that first formed and evaluated large air mobile combat units, started at Secretary McNamara’s initiative and direction, not the Army’s.) The helicopter troop-lift capacity of the Army has increased

about three times over since 1961. It has made a very large contribution to our military effectiveness in Vietnam. Why not mention Secretary McNamara's decision in 1961 to buy the F-4 for the Air Force instead of continuing the F-105? It was very controversial at the time, but it is clear now that it was the right decision.

PPBS AND VIETNAM

Because it illustrates the strengths and limitations of PPBS, I think it is useful to discuss the question: "How has PPB been relevant or useful in Vietnam?"¹²

Does PPBS play a significant role in the really crucial decisions concerning Vietnam? Did we make the right decision in going into Vietnam in the first place? Did we go in the right way, at the right time, and on the right scale? How many forces should we deploy there next year? How can we do substantially better next year than we did last year? How can we achieve a just settlement? These are really crucial questions. The Planning-Programming-Budgeting System will not help in answering them. Nobody claims that it will.

Moreover, PPBS does not affect the tactical decisions. Should we deploy one of our divisions into the Delta? Should we assault this hill or make that sweep? Should we devote more of our men to offensive action against main forces or use them in pacification? The Planning-Programming-Budgeting System will not answer these questions. Nobody claims that it will.

Should the South Vietnamese Government negotiate with the NLF? Under what conditions should we negotiate with the Government of North Vietnam? Where? How? On what terms? The Planning-Programming-Budgeting System will not help in answering these questions. Nobody claims that it will.

Thus, PPBS is definitely not a panacea. There are obvious limits to what any management system can accomplish. Still, the contributions of PPBS to our effort in Vietnam have been important and worthwhile. First, we entered the war with balanced forces ready to fight. The forces were deployed as needed without personnel or materiel shortages.

Second, the forces that we deployed were qualitatively much better than they were a few years earlier. The Air Mobile Division was ready when it was needed.

As a part of the Vietnam buildup, we have added about 500,000 men to the Army and about 100,000 men to the Marine Corps to strengthen our land forces. As a result of our experience in PPBS, it has been possible to do a much more orderly, effective job of planning these increases. As an extension of PPBS, we have a Vietnam deployment planning system for coordinating the force planning, the budgeting, the personnel planning, and the procurement. When the Secretary of Defense decided to add a division to the Army, our experience in PPBS helped us to do a better job of determining what we should recommend be added to the financial plan, to the manpower plan, etc. And, these increases could be made in a more balanced and synchronized way.

The Planning-Programming-Budgeting System has resulted in better, tighter financial planning during the buildup, leading to less inflation, less economic dislocation, etc. A comparison with our experience in the Korean War is pertinent.

	Korea		Vietnam	
	FY 50	FY 52	FY 65	FY 67
Defense Spending in Billions (1966 Dollars)-----	\$15.9	\$53.5	\$48.7	\$68.0
Defense New Obligational Authority in Billions (1966 Dollars)-----	\$20.6	\$86.1	\$51.9	\$72.8
Military Personnel at End-FY (Thousands)-----	1460	3635	2655	3377
Forces in Korea (Thousands)-----	-----	309	50	50
Forces in Vietnam (Thousands)-----	-----	-----	60	450
Forces in Europe (Thousands)-----	120	355	357	350

As the table shows, from 1950 to 1952, Defense expenditures rose 220 percent while New Obligational Authority increased 320 percent. These increases are indicative of several facts. The United States Armed Forces were small and unprepared at the beginning of the Korean War.

The particular point I want to make here is that, by today's standards, the force and financial planning was very disorderly. The increase in requested appropriations was out of proportion to the increase in expenditures. In fact, much of the appropriated money was not used for several years. Clearly, at that time, we did not have good estimates of our financial or materiel requirements. By comparison, from 1965 to 1967, both Defense expenditures and appropriations rose by about 40 percent in a balanced and relatively orderly way. I do not want to suggest that we have achieved perfection in this sort of planning; far from it. But the history of the Korean and Vietnam buildups will show that the requirements planning and associated financial planning was much more systematic and orderly this time than last. Moreover, today's methods give the Congress much better control.

PPBS has given us the potential for better, less wasteful financial and force structure control at the end of the war. Just as PPBS has assisted us in identifying and making balanced increases in our procurement, manpower, operating supplies, and installations, so I think at the end of the war PPBS can assist us in making orderly and balanced decreases. Because, through PPBS, we have been able to identify all of the resources associated with our forces and clarify the character of the association, it is easier to add or delete these resources as required.

PPBS AND POLITICS

Is PPBS "technocracy versus politics?" No. Is PPBS in conflict with political realities? No. Is there a danger that PPBS might develop into a contest between experts and politicians? I do not think so.

Your *Initial Memorandum* referred to the potential conflict between experts and politicians, and expressed the fear that PPBS was a scheme conceived by experts to take power from politicians. Insofar as

there is conflict in our political system between the experts and the politicians, I believe that PPBS is on the side of the politicians. I would like to make four points to illustrate my belief.

First, one main purpose of PPBS is to translate the financial budgets from detailed listings of objects of expenditure, whose purpose is not set forth for the generalist, into mission-oriented categories, whose broad purposes are set forth. Thus, PPBS has translated the Defense budget from procurement, operating expenses, manpower, construction lists, etc., into a breakdown by Strategic Retaliatory Forces, Continental Air and Missile Defense Forces, General Purposes Forces, Research and Development, etc. We have additional breakdowns under these headings by output-oriented weapon systems. The Congress quite rightly asked for and got this information so that its members could have a clearer picture of where the money was going.

One of the main purposes of systems analysis is to translate the lower level, detailed, technical criteria of the experts into broader, more general criteria of significance to the political leaders. Thus our studies in Strategic Offensive and Defensive Forces led to the translation of such factors as weapon yield, reliability, and accuracy into target destruction, and target destruction into lives lost and lives saved. Surely the number of lives saved by the expenditure of \$10 or \$20 billion on an anti-missile system is of greater significance to the politician than the "single-shot kill probability" of a Sprint missile against a re-entering Soviet warhead. Similarly, the number of division forces that can be deployed and closed in Europe, within 60 days, can be of much more significance to the politician than the ton-miles carried by our ships or aircraft. We now have these measures; Secretary McNamara presents them to you in his posture statement. It has taken a lot of analytical effort to develop them.

Second, PPBS is a response to requests from the Congress, particularly from this committee and from the House Appropriations Committee. This committee has been especially clear on this point. In 1961 it stated that budgets should be prepared "in such a way as to make them most useful in establishing priorities, in forward planning, in choosing between programs, and in measuring expenditures against meaningful performance yardsticks."¹³

Third, as I mentioned earlier, PPBS is not a substitute for debate. It is a way of making the relevant factors, issues, assumptions, and uncertainties explicit so that a constructive, useful debate can be held. Then the significant points of agreement and disagreement can be identified and their importance assessed in a systematic way. In fact, I believe that effective systems analysis requires stimulation and testing by debate, and that one of the most important contributions that systems analysis has made to the operation of the Department of Defense has been to provide ground rules and procedures for making the debate on strategy and requirements more factual, informed, and relevant.

Fourth, your *Initial Memorandum* states: "The experience to date does not suggest that the Department of Defense is likely to place before Congressional committees the analyses of costs and benefits of competing policies and programs on which the Department based its own choices."¹⁴ That is not true. The record shows that Secretary

McNamara has clearly and explicitly displayed the major alternatives considered and an evaluation of them in his testimony to the Congress on major issues. To document this, I am attaching to my statement, as an Appendix, a series of unclassified excerpts from the statements of the Secretary of Defense, over the last several years, showing his explicit treatment of the alternatives in anti-missile defense, our bomber force, and other issues. Many more examples can be found in the classified and unclassified versions of his statements.

ZEALOTS OF PPBS?

Your *Initial Memorandum* speaks of “zealots of PPBS” and “enthusiastic advocates” who overplay its benefits. Who are the zealots of PPBS? I take it this is not meant to include the President, whose favorable comments on PPBS you cite. At least in my opinion, it does not include the officials appointed by him or his predecessor to develop PPBS. The *Initial Memorandum* also speaks of the “proponents of PPBS,” but cites only one by name, Charles Hitch. Is it reasonable to infer from this that the authors of the *Initial Memorandum* consider Charles Hitch to be the chief zealot?

I am referring to such statements as the following:

1. “Some of the less historically-minded proponents of PPBS strongly imply that it is something brand new, providing decisionmakers for the first time with a rational basis for choosing between alternative policies.”¹⁵
2. “Some of the more enthusiastic advocates of PPBS seem to suggest that it can work miracles in all corners of government.”¹⁶
3. “Very strong claims are made for the contribution of PPB to Defense. Charles Hitch, who as Comptroller of the Defense Department had the primary responsibility for fashioning and directing the system, summarized his view of it . . .”¹⁷
4. “Even in Defense the benefits of the PPB system have been overplayed by its proponents.”¹⁸
5. “Charles Hitch *himself* has sounded a cautionary note: . . .” (Emphasis added.)¹⁹
6. “Does PPBS provide a wholly rational basis for decision-making? Have we arrived at that technocratic utopia where judgment is a machine-product? Not even the zealots of PPBS would answer these questions affirmatively, although some of them talk as though we should be moving in this direction.”²⁰

This implicit attack on Mr. Hitch is too unfair to be allowed to stand in the record unchallenged. Moreover, I do not believe these statements apply to any of the officials with whom I am acquainted who are responsible for PPBS.

To anyone who knows Charlie Hitch, the charge is ridiculous. It is obvious that he is not a PPBS zealot or any other kind of zealot. To those who do not personally know Mr. Hitch, I suggest a look at the record.

First, Mr. Hitch served with distinction as Comptroller of the Department of Defense under two Presidents. He was recently elected President of the University of California by a unanimous vote of the Board of Regents which includes a governor of the opposite political party from that of the Administration in which Mr. Hitch served in Washington. That the choice of Mr. Hitch for this sensitive position should meet with the enthusiastic approval of all of the many interested parties is a tribute to his great abilities, his distinguished record, and the high esteem in which he is held by all his associates. *No PPBS*

zealot could have been elected President of the University of California.

Second, read his lectures on *Decision-Making for Defense*—not just one quote in the *Initial Memorandum* taken out of context to suggest a point that isn't true—but the whole set, and you will see the kind of judicious, balanced, analysis for which Mr. Hitch is justly famous.

However, the *Initial Memorandum* is correct in suggesting that there is a problem. There is a widespread and totally wrong impression going around that PPBS is a computerized magic wand. I occasionally find it necessary to reassure people that I don't have a mysterious computer or black box under my desk with all of the answers to problems of national security. I am grateful to you, Mr. Chairman, and to this subcommittee, for giving me the opportunity to join you in attacking this false picture of PPBS.

Where does this false picture come from? One source is a small segment of the press—not the veterans of the Pentagon press corps—who seem to think that tales of computer witchcraft make good copy. Fortunately, they are not the majority. The other source is the grotesque caricatures drawn by some of the more extreme critics of PPBS. For example, consider this statement by Vice Admiral Rickover:

The basis for using cost-effectiveness studies as the rationale on which to make a decision is the assumption that the important factors can be expressed in numerical form and that a correct judgment of the situation can then be calculated mathematically.²¹

That clearly is *not* the basis for using "cost-effectiveness" studies as an aid to decision making. The real basis for using "cost-effectiveness" studies is their capacity to provide the decision makers with the best available information to which they can apply their judgment and experience to reach a decision.

The excesses you attribute to the "PPBS zealots" may in fact be the work of anti-PPBS zealots.

I don't want to "oversell" PPBS or "undersell" it. I do think, however, when one looks at the record of PPBS in the Defense Department since 1961, that a large part of the enthusiasm for the system is justified.

SUMMARY

Let me now summarize briefly.

First, before 1961, several committees of the Congress, including the one before which I have the honor of appearing today, justly criticized the budgetary process in the Department of Defense because:

- (1) it was based on arbitrary and predetermined financial limits unrelated to military strategy or needs;
- (2) it was done entirely by objects of expenditure which were unrelated to the missions of the Department of Defense;
- (3) it was a piecemeal, one-year-at-a-time-effort, without adequate attention to long-run consequences; and
- (4) it paid insufficient attention to measures of performance or effectiveness.

Since 1961, we have developed a Planning-Programming-Budgeting System in the Department of Defense that:

(1) starts with a review of strategy and military needs, develops a program to meet them, and derives an annual budget without regard to predetermined financial limits;

(2) is based on a financial plan that identifies Defense spending by the major military missions subdivided into meaningful "output-oriented" program elements;

(3) projects forces eight years into the future, costs at least five years (and to completion for major systems); and

(4) focuses attention on explicit measures of effectiveness.

For the very reasons that the Congress called for these reforms, I believe that they enable us to manage the Department of Defense better.

Second, open and explicit analysis, reviewed and commented on by all interested parties is fundamental to the working of PPBS in the Pentagon. No major force issues are decided by the Secretary of Defense on the basis of analysis by any one office or department alone. The analyses underlying the Secretary's decisions are circulated for comment and review by all interested parties, and their comments go directly to him. The procedures are designed so that the Secretary will hear all sides, so that no one has a monopoly on the information going to the Secretary. This open and explicit approach is our best protection against persistent error; it makes it virtually impossible for any group to rig the analysis without that point being made clear to the Secretary. It ensures that all assumptions are made explicit and that all opinions are considered.

Third, systems analysis is an integral part of PPBS. Systems analysis is not synonymous with the application of mathematical techniques or computers. Systems analysis is not a substitute for judgment; it is an aid to judgment.

"Cost-effectiveness" analysis does not lead to an over-emphasis on cost. It does not stifle innovation; on the contrary, it helps it. It does not always lead to buying the cheapest system; there are numerous examples to the contrary. "Cost-effectiveness" analysis does not lead to an overemphasis on factors that can be reduced to numbers; on the contrary, good systems analysis frees the decision maker to concentrate on the intangibles and uncertainties.

Fourth, PPBS has not led to a single set of assumptions dominating military strategy; it has not led to a single, rigid military strategy; it has not eliminated flexibility; and it has not over-centralized the Defense decision making process. On the contrary, PPBS in the Department of Defense has been associated with a change from the inflexible strategy of "massive retaliation" to a strategy of "flexible response." Moreover, it has been associated with large increases in our military strength to give us the balanced, ready forces we need to support this strategy.

Fifth, the potential of PPBS is great in clarifying debate over program issues, in stimulating and recognizing new solutions to problems, and in helping the Government to spend money wisely. Within the limits of what any improvement in management can do, I believe that PPBS has the potential to be a most important innovation in government management.

Let me close with a story which perhaps makes one of the basic points about PPBS. In the early 1960s, I was invited to address the cadets at West Point. After my talk, which was an explanation of what we now call PPBS, Colonel G. A. "Abe" Lincoln, the distinguished Head of the Department of Social Sciences, came up to me and said :

You know, Alain, you aren't doing anything *new*. You're just applying the principles of rational decision making we've been teaching for years. The only difference is that you're *doing* it.

You're right, Abe. We're *doing* it. And it isn't always easy.

Footnotes

¹ *Department of Defense Appropriation Bill, 1961*, House of Representatives Report Number 1561, 86th Cong., 2d sess., April 29, 1960, p. 25.

² *Major Defense Matters, Hearings, Preparedness Investigating Subcommittee, Committee on Armed Services, U.S. Senate, 86th Cong., 1st sess., May 20, 1959, p. 207.*

³ *Organizing for National Security: The Bureau of the Budget and the Budgetary Process*, Subcommittee on National Policy Machinery, Committee on Government Operations, U.S. Senate, 87th Cong., 1st sess., October 16, 1961, p. 4.

⁴ *Ibid.*, pp. 4-5.

⁵ *Ibid.*, p. 8.

⁶ *Major Defense Matters, op. cit.*, p. 206.

⁷ *Planning-Programming-Budgeting: Initial Memorandum*, Subcommittee on National Security and International Operations, Committee on Government Operations, U.S. Senate, 90th Cong., 1st sess., August 11, 1967, p. 14.

⁸ *Organizing for National Security: Final Statement of Senator Henry M. Jackson*, Subcommittee on National Policy Machinery, Committee on Government Operations, U.S. Senate, 87th Cong., 1st sess., November 15, 1961, p. 4.

⁹ *Initial Memorandum, op. cit.*, p. 12.

¹⁰ *Ibid.*, pp. 11-12.

¹¹ *Ibid.*, p. 12.

¹² *Ibid.*, p. 13.

¹³ *The Bureau of the Budget and the Budgetary Process, op. cit.*, p. 4.

¹⁴ *Initial Memorandum, op. cit.*, pp. 15-16.

¹⁵ *Ibid.*, p. 10.

¹⁶ *Ibid.*

¹⁷ *Ibid.*, p. 11.

¹⁸ *Ibid.*

¹⁹ *Ibid.*, p. 13.

²⁰ *Ibid.*, p. 14.

²¹ *Planning-Programming-Budgeting: Selected Comment*, Subcommittee on National Security and International Operations, Committee on Government Operations, U.S. Senate, 90th Cong., 1st sess., July 26, 1967, p. 600.

APPENDIX

1. DEPLOYMENT OF NIKE-X FOR DEFENSE OF OUR CITIES AGAINST A SOVIET ATTACK¹

What is involved here is an analysis of the contribution the NIKE-X system might make to the defense of our cities under two assumptions:

- (1) That the Soviets do *not* react to such a deployment.
- (2) That the Soviets do react in an attempt to preserve their "Assured Destruction" capability.

As you know, the major elements of the NIKE-X system are being developed in such a way as to permit a variety of deployments; two have been selected for the purposes of this analysis. The first, which I will call "Posture A," represents a light U.S. defense against a Soviet missile attack on our cities. It consists of an area defense of the entire continental United States, providing redundant (overlapping) coverage of key target areas; and, in addition, a relatively low-density SPRINT defense of a number of the largest cities to provide some protection against those warheads which get through the area defense. The second deployment, which I call "Posture B", is a heavier defense against a Soviet attack. With the same area coverage, it provides a higher-density SPRINT defense for twice the number of cities.

Shown on the following table are the components and the costs (which, if past experience is any guide, may be understated by 50 to 100 percent for the systems as a whole) of Posture A and Posture B.

	POSTURE A	POSTURE B
	Invest. Cost (\$ Billion)	Invest. Cost (\$ Billion)
<i>Radars</i>		
MAR		
TACMAR		
PAR		
MSR		
Invest. Cost.....	\$6. 5	\$12. 6
<i>Missiles</i>		
SPARTAN		
SPRINT		
Invest. Cost.....	\$2. 4	\$4. 8
DoD Invest. Cost.....	\$8. 9	\$17. 4
AEC Invest. Cost.....	1. 0	2. 0
Total Invest. Cost (ex-R&D)....	\$9. 9	\$19. 4
Annual Operating Cost.....	\$0. 38	\$0. 72
No. of Cities w/Term. Def:.....	X	2X

The Multi-function Array Radar (MAR) is a very powerful phased-array radar which can perform all the defense functions involved in engaging a large, sophisticated attack: central control and battle management, long-range search,

¹ Extract from Statement of Secretary of Defense Robert S. McNamara before the U.S. Senate Armed Services Committee, 90th Cong., 1st sess., January 25, 1967, p. 45 (Defense Department mimeograph.)

acquisition of the target, discrimination of warheads from decoys or "spoofing" devices, precision tracking of the target, and control of the defense interceptor missiles.

The TACMAR Radar is a scaled down, slightly less complex and less powerful version of the MAR, which can perform all the basic defense functions in a smaller, less sophisticated attack.

The Perimeter Acquisition Radar (PAR) is a phased-array radar required for the very long-range search and acquisition functions involved in area defense. To achieve the full potential of the extended-range SPARTAN, the target must be picked up at much greater distances in order to compute its trajectory before the SPARTAN is fired.

The Missile Site Radar (MSR) is a much smaller, phased-array radar needed to control the SPRINT and SPARTAN interceptor missile during an engagement. It can also perform the functions of the TACMAR but on a considerably reduced scale. Actually, a number of different sizes are being studied. This "modular" approach will permit us to tailor the capacity of the radar to the particular needs of each defended area.

The SPARTAN is a three-stage missile with a nuclear warhead capable of intercepting incoming objects at relatively long range above the atmosphere.

The SPRINT is a shorter range, high-acceleration interceptor missile designed to make intercepts at lower altitudes.

The technical principles involved in the radars are now fairly well established. One R&D MAR-type radar has been constructed at the White Sands Missile Range. A contract has been let for the power plant of a second MAR-type radar, which is to be constructed on Kwajalein Atoll. The Missile Site Radar is well along in development and the construction of one of these radars on Kwajalein Atoll has also begun.

Testing of the SPRINT missile was started at White Sands in November 1965 and the tempo of testing will steadily increase during the current year. The SPARTAN is still on the drawing boards. It represents a very substantial redesign of the original ZEUS and we will not know until it is flight tested how well it will perform.

Facilities for testing both the SPRINT and the SPARTAN will be constructed on Kwajalein Atoll. These, together with the TACMAR and MSR and the programs for the computers will give us all of the major elements of the NIKE-X system which are essential to test its overall performance against reentry vehicles fired from Vandenberg Air Force Base in California. (We feel we know enough about the PAR technology to be able to use the mechanically steered radars already on Kwajalein as simulators.) The system will be tested in stages, starting with the MSR and SPRINT, then the SPARTAN missile and the TACMAR radar. A large number of test shots will be launched from the west coast of the United States to Kwajalein to test the system thoroughly as a whole. The most important objective of this effort is to determine proper system integration and computer programming, since the individual components of the system will have already been tested.

But even after this elaborate test program is completed, some technical uncertainties will still remain unresolved; this is to be expected in a system designed for such a highly complex mission. Moreover, we have learned from bitter experience that even when the development problems have been solved, a system can run into trouble in production or when it is put into operation. All too often the development prototype cannot be produced in quantity without extensive re-engineering. Production delays are encountered and costs begin to spiral. Sometimes these problems are not discovered until the new system actually enters the inventory and has to function in an operation environment. The TERRIER, TALOS, and TARTAR ship-to-air missiles are a good example; after spending about \$2 billion on development and production of these missiles, we had to spend another \$350 million correcting the faults of those already installed, and we still plan to spend another \$550 million modernizing these systems.

In this connection, it is worth noting that had we produced and deployed the NIKE-ZEUS system proposed by the Army in 1959 at an estimated cost of \$13 to \$14 billion, most of it would have had to be torn out and replaced, almost before it became operational, by the new missiles and radars of the NIKE-X system. By the same token, other technological developments in offensive forces

over the next seven years may make obsolete or drastically degrade the NIKE-X system as presently envisioned. We can predict with certainty that there will be substantial additional costs for updating any system we might consider installing at this time against the Soviet missile threat.

The deployment of a NIKE-X system would also require some improvement in our defense against manned bomber attack in order to preclude the Soviets from undercutting the NIKE-X defense; and we would want to expand and accelerate the fallout shelter program. The investment cost (including R&D) of the former is estimated at about \$1.5 to \$2.4 billion and would provide for a small force of F-111 or F-12 type interceptors and airborne warning and control aircraft (AWACS). The expanded fallout shelter program would cost about \$800 million more than the one we are now pursuing. We would also need some of our anti-submarine warfare forces for use against Soviet missile submarines, but we are not yet clear whether these ASW forces would actually have to be increased over the currently planned levels. In any event, the "current" estimates of the investment cost of the total Damage Limiting package would amount to at least \$12.2 billion for Posture A and at least \$21.7 billion for Posture B.

To test the contribution that each of these NIKE-X deployments might make to our Damage Limiting objectives, we have projected both the U.S. and Soviet strategic nuclear forces (assuming no reaction by the Soviets to the U.S. ABM deployment) to the time when Posture B, the heavier defense, could be fully in place.

The fatalities which these Soviet forces could inflict upon the U.S. (with and without a U.S. ABM defense) and the fatalities which the U.S. forces could inflict on the Soviet Union (with a Soviet ABM defense) are shown on the table [below]:

Number of fatalities¹ in an all-out strategic exchange (in millions)² (assumes no Soviet reaction to U.S. ABM deployment)

U.S. Programs	Soviets strike first, U.S. retaliates		U.S. strikes first, Soviets retaliate ³	
	U.S. fat.	Sov. fat.	U.S. fat.	Sov. fat.
Approved-----	120	120+	100	70
Posture A-----	40	120+	30	70
Posture B-----	30	120+	20	70

¹ Fatality figures shown above represent deaths from blast and fallout; they do not include deaths resulting from fire storms, disease, and general disruption of everyday life.

² The data in this table are highly sensitive to small changes in the pattern of attack and small changes in force levels.

³ Assumes U.S. minimizes U.S. fatalities by maximizing effectiveness of strike on Soviet offensive system.

The first case, "Soviets Strike First, U.S. Retaliates", is the threat against which our strategic forces must be designed. The second case, "U.S. Strikes First, Soviets Retaliate", is the case that would determine the size and character of the Soviet reaction to changes in our strategic forces, if they wish, as clearly they do, to maintain an Assured Destruction capability against us.

These calculations indicate that without NIKE-X and the other Damage Limiting programs discussed earlier, U.S. fatalities from a Soviet first strike could total about 120 million; even after absorbing that attack, we could inflict on the Soviet Union more than 120 million fatalities. Assuming the Soviets do not react to our deployment of an ABM defense against them, which is a most unrealistic assumption, Posture A might reduce our fatalities to 40 million and Posture B to about 30 million.

Although the fatality estimates shown for both the Soviet Union and the U.S. reflect some variations in the performance of their respective ABM systems, they are still based on the assumption that these systems will work at relatively high levels of effectiveness. If these ABM systems do not perform as well as our technical people postulate, fatalities on both sides could be considerably higher than shown in the table above, or the costs would be considerably higher if

major improvements or additions had to be made in the systems to bring them up to the postulated level of performance.

If the Soviets are determined to maintain an Assured Destruction capability against us and they believe that our deployment of an ABM defense would reduce our fatalities in the "U.S. Strikes First, Soviets Retaliate" case to the levels shown in the table above, they would have no alternative but to increase the second strike damage potential of their offensive forces. They could do so in several different ways. Shown in the table below are the relative costs to the Soviet Union of responding to a U.S. ABM deployment in one of these possible ways:

<i>Level of U.S. Fatalities Which Soviets Believe Will Provide Deterrence¹ (Millions)</i>	<i>Cost to the Soviets of Offsetting U.S. Cost to Deploy an ABM</i>
40 -----	\$1 Soviet cost to \$4 U.S. cost
60 -----	\$1 Soviet cost to \$2 U.S. cost
90 -----	\$1 Soviet cost to \$1 U.S. cost

¹ U.S. fatalities if U.S. strikes first and Soviets retaliate.

If the Soviets choose to respond in that way to our ABM deployment, the results would be as shown below:

Number of fatalities in an all-out strategic exchange (in millions) (assumes Soviet reaction to U.S. ABM deployment)

U.S. Programs	Soviets strike first, U.S. retaliates		U.S. strikes first, Soviets retaliate	
	U.S. fat.	Sov. fat.	U.S. fat.	Sov. fat.
Approved (no response) -----	120	120+	100	70
Posture A -----	120	120+	90	70
Posture B -----	120	120+	90	70

In short, the Soviets have it within their technical and economic capacity to offset any further Damage Limiting measures we might undertake, provided they are determined to maintain their deterrent against us. *It is the virtual certainty that the Soviets will act to maintain their deterrent which casts such grave doubts on the advisability of our deploying the NIKÉ-X system for the protection of our cities against the kind of heavy, sophisticated missile attack they could launch in the 1970s. In all probability, all we would accomplish would be to increase greatly both their defense expenditures and ours without any gain in real security to either side.*

2. ALTERNATIVE DAMAGE LIMITING PROGRAM ²

In order to assess the potentials of various Damage Limiting programs we have examined a number of "balanced" defense postures at different budget levels. These postures are designed to defend against the assumed threat in the early 1970s. To illustrate the critical nature of the timing of the attack, we used two limiting cases. First, we assumed that the enemy would initiate nuclear war with a simultaneous attack against our cities and military targets. Second, we assumed that the attack against our cities would be delayed long enough for us to retaliate against the aggressor's military targets with our missiles. In both cases, we assumed that all new systems will perform essentially as estimated since our main purpose here was to gain an insight into the overall problem of limiting damage. The results of this analysis are summarized in the table below.

² Statement of Secretary of Defense Robert S. McNamara before the U.S. Senate Armed Services Committee, 89th Cong., 1st sess., February 24, 1965, p. 47. (Defense Department mimeograph.)

Estimated effect on U.S. fatalities of additions to the approved Damage Limiting program (based on 1970 population of 210 million)

Additional Investment	Millions of U.S. Fatalities	
	Early Urban Attack	Delayed Urban Attack
\$0 billion.....	149	122
5 billion.....	120	90
15 billion.....	96	59
25 billion.....	78	41

The \$5 billion of additional investment (of which about \$2 billion would come from non-Federal sources) would provide a full fallout shelter program for the entire population. The \$15 billion level would add about \$8½ billion for a limited deployment of a low cost configuration of a missile defense system, plus about \$1½ billion for new manned bomber defenses. The \$25 billion level would provide an additional \$8½ billion for anti-missile defenses (for a total of about \$17 billion) and another \$1½ billion for improved manned bomber defenses (for a total of \$3 billion).

The number of strategic missiles required to take full advantage of the possibility that the aggressor might delay his attack on our cities is already included in the forces programmed through 1970.

The high utility of a full nation-wide fallout shelter program in the Damage Limiting role is apparent from the foregoing table—it would reduce fatalities by about 30 million compared with the present level of fallout protection. The following table shows that a transfer of resources from fallout shelters to other defensive systems would result in substantially less effective defense postures for any given budget level.

Estimated effect of fallout protection on U.S. fatality levels for several Damage Limiting programs (based on 1970 total population of 210 million)

Additional Investment	Millions of U.S. Fatalities			
	Early Urban Attack		Delayed Urban Attack	
	Partial Protection	Full Protection	Partial Protection	Full Protection
\$0 billion.....	149	149	122	122
5 billion.....	145	120	107	90
15 billion.....	121	96	79	59
25 billion.....	107	78	59	41

The figures indicate that in the case of an early attack on our urban centers, for the same level of survivors, any Damage Limiting program which excludes a complete fallout shelter system would cost at least twice as much as a program which includes such a system—even under the favorable assumption that the enemy would not exploit our lack of fallout protection by surface bursting his weapons upwind of the fallout areas. In addition, fallout shelters should have the highest priority of any defensive system because they decrease the vulnerability of the population to nuclear contamination under *all* types of attack. Since at the \$15 and \$25 billion budget levels, the bulk of the additional funds would go to missile defense, a high confidence in the potential effectiveness of the system would have to be assured before commitment to such large expenditures would be justified. Furthermore, at these budget levels, missile defenses would also have to be interlocked with either local or area bomber defenses in order to avoid having one type of threat undercut a defense against the other.

Although missiles clearly have a better chance than bombers of destroying residual enemy offensive forces because they can reach them much sooner, we also

examined the effectiveness of bombers in the Damage Limiting role. In one such analysis we compared a strategic aircraft—the AMSA—and two strategic missiles—MINUTEMAN II and an improved missile for the 1970s. (This improved missile could be developed and deployed within the same time frame as the AMSA.) Although there are many uncertainties with regard to both the assumptions and the planning factors used in this comparison, it did demonstrate clearly one important point, namely, that there are less costly ways of destroying residual enemy missiles and aircraft than by developing and deploying a new AMSA—even ignoring the fact that enemy missile silos and bomber fields are far more likely to be empty by the time the bombers pass over than when the missiles arrive.

3. THE ROLE OF THE MANNED BOMBER FORCE ²

Given current expectations of vulnerability to enemy attack (before and after launch), and simplicity and controllability of operation, missiles are preferred as the primary weapon for the Assured Destruction mission. Their ability to ride out even a heavy nuclear surprise attack and still remain available for retaliation at times of our own choosing weighs heavily in this preference. (We are quite confident that the Soviets do not now have, and are most unlikely to have during the next five years, the ability to inflict high levels of pre-launch attrition on our land-based missiles, or any attrition on our submarine-based missiles at sea.)

However, in order to determine how best to hedge against the possibility that our missile forces may turn out to be less reliable and may suffer greater pre-launch attrition than currently estimated, we have analyzed alternative ways in which additional forces might be provided. To simplify the presentation, we show a hypothetical case in which our missile forces would be barely adequate for the Assured Destruction task, given the expected missile effectiveness and allowing no missiles for other tasks. (In fact, our approved missile forces are far larger than required for the Assured Destruction task and, therefore, already have built into them a large measure of insurance.) The table [below] shows the cost of insuring against various levels of unexpected missile degradation, by buying either additional missiles or bombers to attack the targets left uncovered as a result of the "assumed" lowered missile effectiveness. Against the current Soviet anti-bomber defenses, we have measured the cost to hedge with bombers in terms of B-52s armed with gravity bombs since the FB-111/SRAM would be a more expensive alternative. Conversely, against an improved Soviet anti-bomber defense, we have used the FB-111/SRAM since it would provide a less expensive hedge than the B-52 armed with either gravity bombs or SRAM.

Cost to hedge against lower than expected missile effectiveness (ten year systems costs in billions of dollars)¹

Assumed Degradation to Missile Effectiveness (Realized/Planned)	Cost to Hedge With:		
	Additional Missiles	B-52/Gravity Bombs (Against Current Soviet Anti-Bomber Defenses)	FB-111/SRAM (Against Improved Soviet Anti- Bomber Defenses) ²
1.0			
.8	\$0.8	\$1.3	\$5.4
.6	2.0	2.6	7.7
.5	3.0	3.3	8.7
.4	4.5	4.0	9.6
.3	7.0	4.7	10.6
.2	12.0	5.3	11.5

¹ Ten year systems costs include for missiles—operating costs plus procurement of missiles for replacement and testing; for bombers—operating costs of bombers/tankers, modification costs plus procurement of the FB-111.

² Assuming the Soviets were to deploy a force of new, improved manned interceptors in the western part of the Soviet Union.

³ Statement of Secretary of Defense Robert S. McNamara before the U.S. Senate Armed Services Committee, 89th Cong., 2d sess., February 23, 1966, p. 49. (Defense Department mimeograph.)

Only when missile effectiveness falls to less than about 50 percent of what we *actually* expect are bombers less costly than missiles for insurance purposes. Against current Soviet defenses, the presently available B-52G-H force (255 aircraft) is adequate to hedge against complete failure of the missile force, insofar as our Assured Destruction objective is concerned. Against possible improved Soviet defenses, we must be willing to believe that our missile effectiveness could turn out to be lower than 30 percent of what we expect before we would wish to insure with FB-111/SRAM aircraft rather than with missiles.

Similar arguments could be developed with respect to "greater-than-expected" Soviet ballistic missile defense effectiveness. I will discuss this and other "greater-than-expected" threats later in this statement.

In summary, for the Assured Destruction mission, manned bombers must be considered in a supplementary role. In that role they can force the enemy to provide defense against aircraft in addition to defense against missiles. This is particularly costly in the case of terminal defenses. The defender must make his allocation of forces in ignorance of the attacker's strategy, and must provide in advance for defenses against both types of attack at each of the targets. The attacker, however, can postpone his decision until the time of the attack, then strike some targets with missiles alone and others with bombers alone, thereby forcing the defender, in effect, to "waste" a large part of his resources. In this role, however, large bomber forces are not needed. A few hundred aircraft can fulfill this function. Accordingly, as will be discussed later, we propose to maintain indefinitely an effective manned bomber capability in our Strategic Offensive Forces.

4. AIR LAUNCHED MISSILES ⁴

Last year we initiated development of SRAM as an element of the four part AMSA program. Now, given the decision to proceed with the procurement and deployment of the FB-111/SRAM system, this development program must be re-oriented to the FB-111 schedule. The cost to complete the SRAM development program is now estimated at \$170 million, including the related B-52 and FB-111 avionics. Some \$8 million was provided in prior years; about \$40 million will be needed in FY 1967.

Although we do not now plan to deploy SRAM on the B-52G-Hs, we propose to undertake the necessary avionics development work to permit such a deployment if it should become desirable later. We would expect to keep the HOUND DOG missiles in the operational inventory through FY 1970 on the same schedule as envisioned a year ago. However, in 1971, with the completion of the phase-out of the B-52C-Fs, the HOUND DOG force would be phased down accordingly. We also propose to undertake engineering development and test of a new terminal guidance system for HOUND DOG which gives promise of achieving a better overall system reliability. Total development cost is estimated at \$20.5 million of which \$6.6 million would be obtained by reprogramming presently available funds and \$8.1 million is included in the FY 1967 Budget.

In summary, the objective of forcing the Soviets to split their defense resources between two types of threats could be performed adequately by B-52 bomber forces considerably smaller than those we now have, i.e., the B-52G-Hs alone. However, a mixed force of B-52G-Hs and FB-111/SRAM would force the Soviets to build expensive terminal bomber defenses or be vulnerable to low altitude attack. Even against very advanced terminal defenses, the small size and low weight of SRAM would allow the U.S. to saturate their defenses with large numbers.

⁴ Statement of Secretary of Defense Robert S. McNamara before the U.S. Senate Armed Services Committee, 89th Cong., 2d sess., February 23, 1966, p. 62. (Defense Department mimeograph.)

The cost of the manned bomber force we now propose, compared with the cost of continuing the current forces, is shown in the table [below].

	FY 1967	FY 1971	FY 1975
	(Costs in Billions of Dollars)		
<i>Current Force Extended</i>			
Forces (# aircraft):			
B-52-----	600	600	600
B-58-----	80	70	64
Costs (Cumulative '67-)-----		\$8.6	\$17
<i>Proposed Bomber Force</i>			
Forces (# aircraft):			
B-52-----	600	255	255
B-58-----	80	0	0
FB-111-----	0	210	210
Costs (Cumulative '67-)-----		\$8.4	\$14

5. MANNED INTERCEPTORS⁵

The manned interceptor force consists of about 860 all-weather aircraft in active units committed to the defense of the North American continent—F-101's, F-102's, and F-106's. In addition, there are about 500 Air National Guard aircraft, a few of which are maintained on runway alert, and a number of Canadian squadrons committed to NORAD.

One of the principal problems we encountered with the interceptor force was its concentration on a relatively few soft bases, many of which were shared with SAC units. Accordingly, our first effort to decrease the vulnerability of the force was devoted to dispersing the interceptors to additional bases. But even now one-half of the active interceptor squadrons are still co-located with SAC. We now propose to disperse these forces further in fiscal year 1964 by providing additional facilities at 21 existing United States interceptor dispersal bases. This action will permit the dispersed deployment of around 25 percent of the active interceptor force for extended periods of time. At the present time, these dispersal bases have only a limited capability for the support of interceptor aircraft. The initial cost of this program would be about \$45 million with continuing annual operating costs estimated at \$15 million.

We still plan to retain the existing interceptor aircraft in the force through the 1964-1968 period. As is shown in Table 3, the number of aircraft in the force, however, will decline gradually because of attrition. By the end of fiscal year 1968 the manned interceptor force would consist of about 750 active Air Force aircraft and 600 Air National Guard aircraft. We believe that this force will be adequate against what we presently foresee as a declining Soviet manned bomber threat. However, if the Soviets should deploy a new long-range bomber, which we do not now deem very likely, we would have to reconsider the size and character of our interceptor force and, particularly, the need for modernization. There are a number of aircraft already in production, under development or programmed which could be adapted to the interceptor role with only modest additional outlays for development costs.

First, there is the F-4, a high performance fighter-interceptor now being procured for both the Navy and the Air Force. A fire control system, the AFG-59 and a missile, the SPARROW III-6B, which would be suitable for this aircraft, are now under development by the Navy. An F-4 type interceptor, because of range and time-in-air limitations, may be the least effective of the alternatives open to us but it could be made available early.

Another possibility is the Navy A-5 (A3J) attack bomber which is already in operation. A fire control system, the ASG-18, and GAR-9 missile, now being

⁵ Secretary of Defense Robert S. McNamara's Posture Statement presented to the U.S. Senate Armed Services Committee, 88th Cong., 1st sess. February 19, 1962, p. 53. (Department of Defense mimeograph.)

developed and tested by the Air Force, would be suitable for this aircraft. The A-5 type interceptor would be somewhat slower and would cost considerably more than the F-4 but it would have a significantly longer range and "time-in-air"—attributes which are especially important in an interceptor—and it could be made available just as early.

A third possibility is the F-111 (TFX) which we have just started developing for the Air Force and the Navy in a tactical role. A suitable fire control system, the N-11, is now under development by the Navy and a long-range missile, HARPY, is being developed for this aircraft. The F-111 should make an excellent interceptor. Its short take-off and landing characteristics would permit dispersal to and recovery from a large number of airfields. Its very long-range and "time-in-air" would permit continuous air patrol during the probable duration of an air battle. The F-111, in an interceptor version would not, of course, become available until the 1968-1969 period, about two or three years later than either the F-4 or the A-5 (A3J).

A fourth possibility would be a completely new interceptor based upon some of the most recent work being done on airframes and engines. Such an aircraft could use the Air Force-developed ASG-18 fire control system and GAR-9 air-to-air missile. It would be a very high performance, but also a very high cost aircraft. It would have a higher speed than the TFX but its range and "time-in-air" would be significantly less.

A fifth possibility would be the adaptation of a large transport aircraft such as the KC-135 or a C-141 as an air-to-air missile platform. Such an aircraft might use an advanced fire control system and a long-range missile like the "EAGLE" which the Navy had under study a few years ago. It would, of course, have a much lower speed than any of the others; i.e., below Mach 1, but it would have a much longer radius of action and "time-in-air" and could carry perhaps as many as 30 air-to-air missiles. The fire control system would be able to track a large number of objects out to long distances and could control a large number of simultaneous interceptions. Because of its size and endurance, the aircraft could also operate as an airborne control center together with shorter range high-speed interceptors. Such an interceptor system would also be less vulnerable to ballistic missile attack since it could take off immediately on warning, remain aloft during the initial missile bombardment, and still have sufficient endurance to engage the follow-on bomber attack.

Whether or not the Soviet Union actually deploys a new long-range bomber, we intend to make a thorough study of the entire problem of modernizing our manned interceptor force and we hope that next year we will be in a better position to make definite recommendations on this subject. I do not believe, in the light of presently available intelligence and the wide range of options still open to us, that the situation requires us to make a decision now.

6. AIRLIFT AIRCRAFT⁶

Even though the C-5A would be very expensive to acquire—\$2.2 billion (including development and procurement) for a force of 48 operational aircraft, or \$3.2 billion for a force of 96 aircraft—on a ten year systems cost basis (i.e., including the cost of development, procurement and ten years of operation), the C-5A would be a much better buy than additional C-141s.

Our calculations show that it would be desirable to reduce the tentatively planned 20 squadron (320 aircraft) C-141 force by seven squadrons (112 aircraft) and substitute 1½ squadrons (24 aircraft) of C-5As. The 1½ squadrons of C-5As would provide the same capability as seven to eight squadrons of C-141s. Further, it is tentatively estimated that the ten year systems cost would be the same, even including the high cost of developing and procuring the new aircraft. Beyond the "break even" point, the C-5A cost per ton delivered would be progressively less than that of the C-141, as shown on the following table:

⁶ Secretary of Defense Robert S. McNamara's classified Posture Statement to the U.S. Senate Armed Services Committee, 89th Cong., 1st sess., February 24, 1965, p. 165. (Defense Department mimeograph.)

Tons delivered in 30 days to SE Asia ¹	Number of aircraft		Tentative estimates of 10-year systems cost per ton deliv. (000) ¹	
	C-141	C-5A	C-141	C-5A
X-----	29	6	\$108	\$223
2X-----	58	12	108	147
3X-----	86	18	106	119
4X-----	115	24	106	102
6X-----	172	36	105	84
8X-----	229	48	104	73
10X-----	286	60	104	69

¹ Real figures remain classified.

I have selected the figure of 13 squadrons of C-141s as the point of departure for this calculation for several reasons:

- (1) The C-141 is already in production. A total of 145 aircraft have been placed in order through FY 1965 funding.
- (2) Assuming we can start full scale development of the C-5A by about July 1, 1965, the first operational aircraft would not be available until late in FY 1969 and possibly not until the end of calendar year 1969. We should not halt the buildup of our airlift between now and then.
- (3) A mixed force of C-141s and C-5As would be desirable in any event since a variety of vehicles with different capacities more nearly produce a uniform matching of capabilities and requirements. The C-141 could carry the denser cargo, thus making fuller use of its payload potential, while the C-5A could carry the bulky cargo. Furthermore, there will always be trips which will not require the very large capacity of a C-5A.

For all of these reasons, a force of 13 squadrons (208 aircraft) of C-141s appears to be the best compromise.

Senator JACKSON. When the committee resumes its next sitting, we will have an opportunity to question Dr. Enthoven on his entire statement, and on any other matter relating to it.

With that statement by the Chair, we will stand in recess, subject to call.

(Whereupon, at 12:02 p.m. the subcommittee recessed, to reconvene at the call of the Chair.)

PLANNING—PROGRAMMING—BUDGETING

WEDNESDAY, OCTOBER 18, 1967

U.S. SENATE,
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

[This hearing was held in executive session and subsequently ordered made public by the chairman of the subcommittee.]

The subcommittee met at 10 a.m., pursuant to notice, in room 3112, New Senate Office Building, Senator Henry M. Jackson (chairman of the subcommittee) presiding.

Present: Senators Jackson, Harris, Mundt, and Baker.

Subcommittee staff members present: Dorothy Fosdick, staff director; Robert W. Tufts, chief consultant; and Richard E. Brown, research assistant.

OPENING COMMENT BY THE CHAIRMAN

Senator JACKSON. The subcommittee will come to order. We welcome you back today, Dr. Enthoven, and look forward to a frank exchange of views on matters discussed in your statement on planning-programming-budgeting in the Department of Defense. At the start I would like to make a general comment or two on what you have said.

For some time I have been disturbed at the way officials, in making their case for the present administration of the Defense Department, distort how things were done by their predecessors. I note this tendency in your statement, in such phrases as "it was not possible for the Secretary of Defense, the President, or the Congress to know in meaningful terms where the Defense dollars were going," or "simply decreeing across-the-board cuts based on some arbitrary financial limit," or "the major strategic decisions . . . were decentralized before 1961 and the result was clearly unsatisfactory," or in quoting your friend who said "all we got from previous Secretaries of Defense was the decision, without explanation or analysis."

These clichés, of course, misrepresent how things were actually handled under previous leadership, what Presidents, Secretaries of Defense, the JCS and Congressional leaders really talked about, and why they believed a certain combination and level of forces would best promote the national interest.

Some good historians and objective scholars are going to have a field day with the oversimplifications that officials have put in the record since 1961 about previous Defense Department policies and methods

under men like Henry L. Stimson, James Forrestal, George C. Marshall, Robert Lovett, Neil McElroy, and Thomas Gates.

The proof of the pudding is in the eating. We did win World War II, and previous administrations since the advent of the nuclear age succeeded in deterring a nuclear war while they were in office. Critical breakthroughs in modern weapons systems were achieved under previous Defense leadership—the A-bomb, the H-bomb, the intercontinental ballistic missile, nuclear power for the Navy, and the Polaris system. In the end we came through the Korean conflict with fairly good results. Frankly, I would rather end up as we did in Korea with some surplus which we could use to good effect later, than pursue a policy of “coming out even in Vietnam” to the point of the shortages we confronted a while ago in some types of bombs and in helicopters, and the pinch we now face in combat pilots.

I think we could all agree that the credibility of our defense posture requires Defense officials to speak out affirmatively for defense policies. But this is possible for officials to do without caricaturing the way the Department of Defense was run under former leadership and without ignoring historical precedents and developments over a considerable period of time, including the well-established authority and leverage of the Office of the Secretary of Defense and the Office of the Comptroller which Secretary McNamara inherited, the defense program ideas developed during 1960 and in the transition period between administrations, as well as the political climate in 1961 which favored increased expenditures for national defense.

Like many of his predecessors, Secretary McNamara has brought about important changes and improvements in the Defense Department: his include greater use of the budget tool for forward programming and for choosing between programs, and the establishment of the Defense Intelligence Agency, and the Defense Supply Agency. To mention some of his substantive contributions, Secretary McNamara recognized the shortage of ground forces to meet the growing threat of so-called “wars of national liberation” and moved early to increase combat-ready divisions, including special forces; he encouraged the concept of the Air Mobile Division; he has upgraded our strategic missile systems, both land and sea based.

As I see it, fairness to prior Defense Department leadership is not just a matter of generosity of spirit—although more generosity of spirit in this regard would be welcome. But it is also a matter of assessing past experience correctly, so that we can draw the right lessons from it.

Obviously, only the long future will finally judge how well anyone has administered the national defense. But as I assess recent history the main lesson I learn is that there is no substitute in government for *generalists with good judgment*. I am concerned that the current fadism with “scientific management” may obscure this crucial lesson.

Modern-day specialists, trained in scientific management, can make a contribution to some problems of government. But this nation's greatest asset is the *wise generalist*, in senior appointive and career positions, with skill and shrewdness in judging the competence of specialists—in sensing when to have confidence in specialist studies, and when not to—and in helping the President judge the operational

feasibility and political acceptability of a plan of action. It is a skill that comes when a specialist widens his interests and takes on assignments presenting board challenges—particularly the challenges of dealing with people in a wide range of different situations at home and abroad.

Also, at this point, I cannot let pass your interpretation of the references to Charles Hitch in the *Initial Memorandum* prepared by the staff of the subcommittee. I have read the whole memorandum again and I find no basis whatsoever for the assumption you make that it contains an implicit attack on Charles Hitch. You have used quotations from the memorandum out of context and drawn inferences that are entirely unwarranted and illogical. As you know, the staff and I, for many years, have had the highest regard for Charles Hitch. I count Mr. Hitch as being a very good friend of mine, and I was delighted and pleased with his election as President of the University of California.

You also seem to have strong feelings about Admiral Rickover. But in the Defense Department, where life and death issues must be resolved, we need some non-conformists who have the credentials and the courage to challenge prevailing orthodoxy. Many a nation and civilization lies buried because there were too many people saying "Yes" when they should have been standing up for alternate views and ideas. I was delighted to see that the Secretary of the Navy, Paul Ignatius, has just asked Admiral Rickover to stay on for another two-year extension of his active duty tour, and that the Admiral has agreed.

Also, one point of clarification: Are the statements by Secretary McNamara which you have included in the appendix of your paper, the actual analyses and documents which were before the Secretary when he made his choices and decisions, or are they excerpts and explanations by Secretary McNamara based on analyses, memoranda and other documents internal to the Executive Branch?

Would you comment on this last point? I know you will have some other comments to make.

TESTIMONY OF DR. ALAIN C. ENTHOVEN, ASSISTANT SECRETARY OF DEFENSE (SYSTEMS ANALYSIS)

Dr. ENTHOVEN. May I comment on the other points, too, Mr. Chairman?

Senator JACKSON. Certainly.

AVAILABILITY OF EXECUTIVE PAPERS AND ANALYSES TO CONGRESS?

Dr. ENTHOVEN. Why don't I start with the last one first? The statements that I attached are, in fact, excerpts from Mr. McNamara's testimony before the Congress. They, in turn, were condensations, or briefs, if you like, of one or several analyses that were before the Secretary at the time that he made the decision. For the most part, these underlying analyses are made available to the Congress on request.

For example, in the case of the decisions on nuclear power for surface ships, I believe that every piece of paper written in the Depart-

ment of Defense in the past few years on that subject has been made available to the Congress.

Senator JACKSON. Has that been true generally?

Dr. ENTHOVEN. It is my understanding that all the studies are available on request.

Senator JACKSON. It is my understanding that some of the documents and papers have been treated as internal matters. Therefore they are not available.

Some studies, of course, have been used to support Defense Department positions before the Congress—like the cost-effectiveness studies DOD used to oppose nuclear power for the aircraft carrier *John F. Kennedy*. Over the years the Joint Committee on Atomic Energy has obtained many of the studies on nuclear power for the Navy, but we have often had to put up quite a fight to get them.

I had understood, however, that some of these papers and documents have been treated as under the doctrine of executive privilege.

Dr. ENTHOVEN. That is right, Mr. Chairman. There is one set of documents that we consider privileged. After reviewing the program recommendations made to him each year, the Secretary of Defense reports to the President the major decisions that he recommends in a series of Draft Memorandums for the President.

Mr. McNamara considers these memorandums as his own personal recommendations to the President. He believes that they should be treated as privileged documents because he does not want to reduce the freedom of action of the President, or his own ability to support the President's decisions, by publicly taking a position that may turn out contrary to the President's decision.

Senator JACKSON. This gets to be a very difficult problem of course, because if a decision has been reached to approve or disapprove a given weapon system and you attempt to justify your decision before Congress, it is pretty hard for us in the Congress to properly interrogate representatives of the Defense Department unless we have the full information.

Under the Constitution, of course, there is no question about the right of the Executive Branch to withhold views that have been expressed in the inner councils of the Presidency.

But you can see where it could be very difficult for the Congress to properly inquire into an area that could be very important, unless the full data was available on which the decision was made.

Dr. ENTHOVEN. Yes, I agree with that, Mr. Chairman. But all of the information is available to the Congress, except those statements which are Mr. McNamara's personal recommendations to the President.

Senator JACKSON. I understand privileged communications between the Secretary and the President. What about the full analyses?

Dr. ENTHOVEN. The full analyses are not in these documents. These documents contain a summary treatment. The full analyses are available to the Congress on request. I believe that, generally speaking, we do provide them. We certainly do in the case of nuclear power for surface ships.

Senator JACKSON. I know we have had a lot of trouble over the years—and I don't want to go into specific examples like the TFX

case—where there has been a lot of controversy over getting some of these papers and documents. Many, of course, we never do get.

CRITICISM OF PRIOR DEFENSE DEPARTMENT MANAGEMENT

Dr. ENTHOVEN. I would like to comment briefly on some of the other points you made Mr. Chairman. First, on the question of criticisms of our predecessors, I certainly don't want to sound like Mark Twain who said that when he was 14 years old he thought his father did not know anything at all but that he was amazed at how much the old man learned in the following 7 years.

I do have a great deal of respect for our predecessors in the Department of Defense and I certainly don't want to make an issue out of whether or not they did a good job.

Senator JACKSON. I don't think that was your intention. I wanted to see if we could not clarify the record on that point.

Dr. ENTHOVEN. The issue is not the men; it's the management system. I did want to point out the shortcomings in the planning and management system with which our predecessors were forced to operate, in order to show what we have done with PPBS. I can't answer the question "what is different now from what you had 7 years ago?" without explaining what we had 7 years ago.

In order to avoid overstating the defects in the pre-1961 management system, I tried to illustrate these shortcomings by quotations from congressional committees, including this one. I thought the committees stated quite accurately and forthrightly what the problems in the management system were.

Next, I cannot agree with you that I misrepresented the actual situation in my statement when I said that: "It was not possible for the Secretary of Defense, the President or the Congress to know in meaningful terms where the Defense dollars were going." The plain fact is that the Secretary of Defense did not know how the Defense budget was divided between Strategic Retaliatory Forces, Continental Air and Missile Defense Forces, Airlift and Sealift Forces, etc. This fact was well known and documented at the time. For example, Senator Lyndon B. Johnson, then Chairman of the Senate Preparedness Subcommittee, summarized the situation very accurately in 1959 when he said:

Two of the members of the Joint Chiefs of Staff agree that too much money is being spent during fiscal year 1959 for defense against manned bombers, yet the Department of Defense had no specific figures as to how much was being devoted to continental air defense in the 1960 Budget. Furthermore, despite all the glowing statements and promises concerning unification in the Department of Defense, the testimony before this and other committees clearly shows that the 1960 budget was never considered, nor were decisions made, on a functional basis for the Department of Defense as a whole but rather decisions were made on a service-by-service basis in relation to individual expenditure targets.

The Planning-Programming-Budgeting System was established to provide such information, and we have been providing it regularly to the Congress since 1962.

Senator JACKSON. Let me say that while your predecessors in the Defense Department formally relied on the traditional type of Defense budget, informally they used other ways of "walking around the

elephant" to gain important insights. In our earlier subcommittee study to which you have referred we took some very interesting testimony on just this point. And well before PPB, it had proved possible to assemble Defense budgetary information by functions or missions for special requirements.

No one form of budget preparation and presentation, of course, is necessarily the most instructive for all purposes.

ISSUE OF SHORTAGES IN BOMBS AND HELICOPTERS IN VIETNAM

Dr. ENTHOVEN. If I may go on to the second point, you referred to shortages in bombs and in helicopters, suggesting failings in our planning. I don't believe there were shortages in bombs or helicopters that in any way could be described as the result of failings in our planning system.

From the outset, in 1961, we put a lot of emphasis on improving our inventories of bombs and helicopters. In the case of bombs, we had substantially increased our inventories of modern non-nuclear bombs. This was often controversial and not always supported by all the Services involved. By the Spring of 1966, when there was an alleged shortage of bombs, we were dropping each month about 35,000 tons of bombs in Vietnam. I don't think you can say there was a bomb shortage when we were dropping 35,000 tons of bombs a month, twice the Korean War rate, and we had about 120,000 tons of bombs, or a 3 month supply in the theater, and around 360,000 tons worldwide. It is true that there were distribution problems. In some cases the fuses showed up on one base and the bomb body on another base.

But these problems were not a consequence of inadequate budgetary planning, or some kind of budget cut or lack of foresight. I think the local management problem was brought on by the speed with which we moved in and various factors that made it difficult to operate in South Vietnam.

Senator BAKER. Mr. Chairman, may I interrupt for a moment?

Senator JACKSON. Certainly.

Senator BAKER. Doctor, I am being in nowise critical, but then it occurs to me that what you just said is a distinction without a difference. It does not make any difference whether 50,000 tons or 5,000 tons of bombs are in Chattanooga, Tennessee, or in Honolulu. The fact remains if they were not where they were needed at the time they were needed there was in fact a shortage of bombs.

Dr. ENTHOVEN. My point is simply this, Senator. If there is a three month supply of bombs and fuses in the theater and, as a hypothetical example, it turns out that there is a two month supply of bombs at Chu Lai without fuses, and a two month excess supply of fuses at Danang, I don't think it makes sense to call that a "bomb shortage."

I think it makes more sense to say that it is a local problem in distributing fuses and bombs. The reason I don't think it makes sense to call this a "bomb shortage" is, that if you do, you imply that it could be cured by buying more bombs. But we could buy 500,000 tons of bombs and still put all the fuses at Chu Lai and all the bomb bodies at Danang and still have the same problem. The cure for such a problem is not buying more bombs; it is doing what was done as soon as the problem was identified, and that was getting the fuses and bombs together.

Senator BAKER. That is the point that I think we really ought to try to elaborate on. I don't want to extend this discussion on your time, because you are replying to the Chairman's questions here. But it seems to me that the situation does not necessarily raise the implication that we should buy more bombs but, rather, that in the spring of 1966 there was a deficiency in the planning and the execution of supply and logistics in producing a workable weapon at the site where it was needed.

That does not create for me the implication, nor imply, that we ought to buy more bombs. It simply says that some place along the line our procurement efforts for fuses or other hardware, and our logistical effort in delivering them where they were needed, failed.

That is all I think it implies to me. To the extent that this reflects on the efficiency of this system or the planning, then I would be most concerned.

Dr. ENTHOVEN. The Planning-Program-Budgeting System that we are talking about is concerned with how many bombs you buy, not with the conduct of logistical operations within the theater.

We had a three month supply of bombs in the theater. The problem was in the local distribution. That is not the kind of problem that falls within the Planning-Programming-Budgeting System.

But even with that local distribution problem, it was during the months in question we were dropping about 35,000 tons of bombs, and the commanders assured us that in no case was an essential mission called for that was not met.

Senator BAKER. May I ask one more question?

Senator JACKSON. Surely.

Senator BAKER. Were the newspaper accounts to the effect that during this period there was an actual rationing of bombs which prevented military air units from striking targets they wished to strike and which were available, true or untrue?

It seems to me this is the test of whether there was a shortage, and not the comparison with the rate at which we were dropping bombs in Korea. I don't think that is the real or meaningful comparison.

Dr. ENTHOVEN. I don't believe that any target that the commanders judged necessary to strike was not struck for lack of bombs.

Senator BAKER. That is not really the question I put. The question I put was: Was there rationing of bombs for use by aircraft which limited the scope and the extent of the attack that might be made by pilots on raids in South or North Vietnam? Was there rationing? That is the first question.

Dr. ENTHOVEN. No. The word "rationing" connotes inadequacy, and I do not believe that is would be accurate to use it. I am not trying to imply that everyone always had all the bombs he could consume; I am saying that Admiral Sharp and General Westmoreland told us they had all they needed to support our troops and destroy necessary targets.

The fact is that we have logistic plans for the consumption, inventories, production, and delivery of all kinds of ammunition, including bombs. The purpose of these plans is to keep the consumption, inventories, production and delivery in balance. So Admiral Sharp had a bomb consumption plan. But he told the commanders that they could exceed the plan if the need arose.

The word rationing was used by someone who wanted to put a bad coloration on Admiral Sharp's consumption plan, but I don't think it would accurately describe what was going on.

Senator BAKER. The point I am trying to get to is that newspaper accounts during this period did imply an unsatisfactory coloration. Specifically, as my memory serves me, they suggested that in some instances pilots could not make attacks on certain targets which were available to them, which had been approved, because they had already dropped all the bombs that they were allotted for that period of time.

This is an example I am trying to explore. Is that true, do you know?

Dr. ENTHOVEN. I don't doubt that there were cases in which the pilots could have dropped more bombs; to the best of my knowledge, there were no cases in which needed missions weren't flown. General Wheeler and others have testified to this effect. My point is that the standard of adequacy I'm using is needed sorties and target destruction, not filling the payload carrying capacity of the airplanes.

I would like to insert here, for the record, an excerpt from testimony by Secretary McNamara and General Wheeler before the Senate Armed Services Committee last January. I think it will help to illuminate the point.

(The excerpt of testimony follows:)

AVAILABLE STOCK OF BOMBS

Chairman RUSSELL. Mr. Secretary, I have heard from airmen that there were a number of instances where they would like to have used thousand-pound bombs, and they had to perform the missions with 250-pound bombs. They say 250-pound bombs will not perform satisfactorily. Is that due to a difference of opinion between the pilot and his commanding officer, or is there a shortage of thousand-pound bombs?

Secretary McNAMARA. I can only assume that it is due to a difference between the pilot and his commanding officer, Mr. Chairman, because we have got a tremendous quantity of all kinds of bombs out there now, with the exception of one or two items [deleted]. But as far as bombs are concerned, there is no reason in the world why they shouldn't use the weapon that is best for the particular target.

Chairman RUSSELL. The civilian officials here in Washington have not prescribed the size or the weight of any bomb?

Secretary McNAMARA. Certainly not.

Chairman RUSSELL. Or of a mission?

Secretary McNAMARA. Certainly not.

General WHEELER. May I add to that?

Secretary McNAMARA. Yes, please do.

General WHEELER. This is one of the questions I asked our commanders in the field. I talked to Admiral Sharp and his staff. I also talked to CINCPAC's fleet commander. I talked to General Westmoreland's air commander, General Momyer [deleted]. And also I talked to the general in Guam.

I asked them, (a) how about their total overall stockages of bombs? They said they had ample. I asked them, (b) within the tonnages they had, whether they had ample supplies of individual items, in other words, were they running short on them?

As the Secretary said, the only two things [deleted] are new items in production. General Momyer stated to me categorically that he had never sent an aircraft north, to North Vietnam, without what he considered to be an optimum loading for the target against which it was directed.

TYPES OF ORDNANCE REQUIREMENTS

He pointed out to me that the requirements for types of ordnance within South Vietnam are entirely different from those in North Vietnam, Mr. Chairman. For example, you have a requirement for very few thousand-pounders, or the heavier

bombs, in South Vietnam because of the type of target. It is different not only as to type ordnance but as to type of mission because he wants more loiter time over the target and so on. I believe Admiral McDonald would tell you that precisely the same policy obtains for the strike aircraft flying.

Senator JACKSON. Let me just observe on this one point that the Preparedness Investigating Subcommittee has issued reports on the bomb problem and the ammunition problem based on its investigations and hearings. Those reports speak for themselves.

With respect to helicopters, Dr. Enthoven, Secretary McNamara very forthrightly stated to our Defense Appropriations Subcommittee of the Senate Committee on Appropriations that they had miscalculated. He was very honest about it, and told us that they had miscalculated on the number of helicopters that would be needed.

I would say that I think you win these conflicts in the last analysis with some surpluses. I don't think surplus is a dirty word in the sense of trying to be well prepared to cope with the problems you must cope with. That you might have something left over after a conflict is not *per se* bad or wrong.

Dr. ENTHOVEN. Let me talk about the helicopters. First, in the early 1960's Secretary McNamara expressed a great deal of personal interest in the increased use of helicopters to improve the tactical mobility of the Army. In fact, in the Spring of 1962, he sent the Secretary of the Army two memorandums directing him to completely re-examine the Army's qualitative and quantitative requirements for aviation because he felt that the Army's plan at the time failed to exploit the potential for radical improvement in the Army's tactical mobility offered by aviation technology. I would like to provide those memorandums for the record at this point.

(The memorandums follow :)

THE SECRETARY OF DEFENSE,
Washington, D.C., April 19, 1962.

MEMORANDUM FOR THE SECRETARY OF THE ARMY

SUBJECT: Army Aviation (U)

This is in response to your two November 1, 1961, memoranda which discussed Army Aviation and presented the Army's proposed procurement program.

These studies greatly enhanced my understanding of what the Army is seeking to achieve through its organic aviation. However, the quantitative procurement programs fall considerably short of providing, in the near future, modern aircraft to fill the stated requirements. While it appears to me that the Army can and should turn increasingly to aviation to improve its tactical mobility, your memoranda do not give a clear picture regarding either the optimum mix of aircraft types or the absolute total numbers that will be required.

Attached is an analysis of your studies made by my office. I would like your comments on this analysis with particular emphasis on the proposed increased buy of Army aircraft for 1964 and on the position that your predicted requirements in this area through 1970 are too low. These comments should be submitted by 15 May 1962.

Furthermore, I would like the Army to completely re-examine its quantitative and qualitative requirements for aviation. This re-examination should consist of an extensive program of analyses, exercises and field tests to evaluate revolutionary new concepts of tactical mobility and to recommend action to give the Army the maximum attainable mobility in the combat area. It appears to me that air vehicles, operating in the environment of the ground soldier but freed from the restrictions imposed by the earth's surface, may offer the opportunity to acquire quantum increases in mobility, provided technology, doctrine, and organization potentials are fully exploited. I believe further that these mobility increases can be acquired without increased funding by reducing less effective surface trans-

portation systems concurrently. The Army's re-examination should therefore give special attention to the following:

(1) To what extent can aviation be substituted for conventional military surface systems of vehicles, roads, bridging, engineer troops, theater supply and hospital complexes, etc?

(2) Should newer concepts of VTOL or STOL fixed-wing aircraft be substituted for helicopters, as a means of avoiding some of the high procurement and operating costs of helicopters?

(3) May we use heavy tactical airlift, combined with new techniques in air dropping and possibly better airfield construction and repair capability, to provide part of the logistic support for ground operations? There should be considered the possibility that Air Force lift may be available, after the first thirty or so days of a strategic lift, to augment Army tactical lift capabilities.

(4) What qualitative requirements can be defined for immediately developable V/STOL air vehicles optimized for such purposes as surveillance, target acquisition, weapons platforms, command posts, communications centers, or troop and cargo carriers of significantly heavier loads?

(5) What organizations and operational concepts are required to exploit the potential increases in mobility? Consideration should be given to completely air-mobile infantry, anti-tank, reconnaissance, and artillery units.

(6) What other concepts and ideas, as well as major limitations, bear on this subject? We should seriously consider fresh, new concepts, and give unorthodox ideas a hearing.

The results of the study should be presented in terms of cost-effectiveness and transport-effectiveness factors. The study should involve the full use of field tests and exercises to test new concepts of mobility.

In addition, the use of operations analysts in planning, observing, recording data, and analyzing results for the field test program appears to me to be essential to the effective accomplishment of the entire re-examination.

As a first step in your re-examination of Army aviation requirements, I would like by 15 May 1962 an outline of how you plan to conduct the re-examination program. The actual re-examination should be completed and your recommendations submitted by 1 September 1962.

(Signed) ROBERT S. McNAMARA.

THE SECRETARY OF DEFENSE,
Washington, D.C., April 19, 1962.

MEMORANDUM FOR MR. STAHR

I have not been satisfied with Army program submissions for tactical mobility. I do not believe that Army has fully explored the opportunities offered by aeronautical technology for making a revolutionary break with traditional surface mobility means. Air vehicles operating close to, but above, the ground appear to me to offer the possibility of a quantum increase in effectiveness. I think that every possibility in this area should be exploited.

We have found that air transportation is cheaper than rail or ship transportation even in peacetime. The urgency of wartime operations makes air transportation even more important. By exploiting aeronautical potential, we should be able to achieve a major increase in effectiveness while spending on air mobility systems no more than we have been spending on systems oriented for ground transportation.

I therefore believe that the Army's re-examination of its aviation requirements should be a bold "new look" at land warfare mobility. It should be conducted in an atmosphere divorced from traditional viewpoints and past policies. The only objective the actual task force should be given is that of acquiring the maximum attainable mobility within alternative funding levels and technology. This necessitates a readiness to substitute air mobility systems for traditional ground systems wherever analysis shows the substitution to improve our capabilities or effectiveness. It also requires that bold, new ideas which the task force may recommend be protected from veto or dilution by conservative staff review.

In order to ensure the success of the re-examination I am requesting in my official memorandum, I urge you to give its implementation your close personal attention. More specifically, I suggest that you establish a managing group of selected individuals to direct the review and keep you advised of its progress. If you choose to appoint such a committee, I suggest the following individuals be considered as appropriate for service thereon: Lt. Gen. Hamilton H. Howze,

Brig. Gen. Delk M. Oden, Brig. Gen. Walter B. Richardson, Col. Robert R. Williams, Col. John Norton, Col. A. J. Rankin, Mr. Frank A. Parker, Dr. Edwin W. Paxson and Mr. Edward H. Heinemann.

Existing Army activities such as Fort Rucker, RAC, STAG (Strategic and Tactics Analysis Group, Washington, D.C.), CDEC (Combat Development Experimental Center, Ft. Ord), and CORG (Combat Operations Research Group, Ft. Monroe), combined with the troop units and military study headquarters of CONARC, and in cooperation with Air Force troop carrier elements, appear to provide the required capabilities to conduct the analyses, field tests and exercises, provided their efforts are properly directed.

The studies already made by the Army of air mobile divisions and their subordinate air mobile units, of air mobile reconnaissance regiments, and of aerial artillery indicate the type of doctrinal concepts which could be evolved, although there has been no action to carry these concepts into effect. Parallel studies are also needed to provide air vehicles of improved capabilities and to eliminate ground-surface equipment and forces whose duplicate but less effective capabilities can no longer be justified economically. Improved V/STOL air vehicles may also be required as optimized weapons platforms, command and communications vehicles, and as short range prime movers of heavy loads up to 40 or 50 tons.

I shall be disappointed if the Army's re-examination merely produces logistics-oriented recommendations to procure more of the same, rather than a plan for implementing fresh and perhaps unorthodox concepts which will give us a significant increase in mobility.

(Signed) ROBERT S. McNAMARA.

Dr. ENTHOVEN. These memorandums led to the establishment of the Howze Board and the formation of several experimental units including the Eleventh Air Assault Division which was the predecessor of the First Cavalry Division (Airmobile) that proved so effective in Vietnam.

Incidentally, these memorandums were drafted for Secretary McNamara's signature by the Systems Analysis Office. Before they were sent, the airmobility minded officers in the Army were having a very difficult time getting their ideas heard. These memorandums gave these officers the charter they needed to bring their ideas to the attention of the top levels of the Department where they could get prompt and favorable consideration for their proposals on the basis of merit rather than vested interest. Anyone who says that PPBS stifles innovation, that it always looks for the cheapest solution, or makes it difficult for those with ideas that differ from the official policy to be heard, should be asked to reconcile his statements with these memorandums.

Secretary McNamara put a lot of his own personal drive and emphasis behind building up our Army and Marine Corps helicopter capability. The result has been more than a four fold increase in the helicopter troop lift capability of the Army and the Marine Corps from 1961 to 1967. A four fold increase in six years, most of which came in the past 3 years as a consequence of decisions in 1963-1965, is a very substantial increase. I think this overall achievement must be kept in mind when you judge particular decisions made along the way. It is true, Mr. Chairman, that in preparing the Fiscal Year 1965 budget, the question of how many UH-1 helicopters we ought to produce came up. The Army was proposing to procure 900, an increase of 200 above the 700 we bought the previous year. I recommended to Secretary McNamara that we stay at about the same rate of 700 we procured in Fiscal Year 1964. He eventually decided on 720.

The reasons for that decision were: first, at the Army's proposed rate of procurement, helicopter production would outrun the for-

mation of units and the training of personnel, thus leading to an imbalance; second, the Army's proposed procurement would lead to a sharp peak in production, necessitating a sharper cutback later; and third, to save money without reducing significantly the rate of buildup in our capability. Let me emphasize again that the issue was a small difference in how to achieve the large increase in capability we all sought.

When we greatly increased our combat forces in Vietnam and saw that the helicopter mobility that we had encouraged was a very good thing, we wanted more, and we regretted that particular decision.

The point I want to make is that there were sensible reasons for making the decision at the time, given the information that we had available to us. At the lower production rate, we retained our flexibility to increase production later on, should that be required. But the main point which I want to emphasize is that the decision not to increase the production rate at that time has to be judged in the context of the major increase in the helicopter capability of the Army that Mr. McNamara was directing.

Senator JACKSON. I just want to say that I think you and Secretary McNamara deserve great credit for moving to increase the air mobility capability of the ground forces. I mentioned that in my opening comments today. I think what the Secretary did to provide for an increase in the ground forces, in particular the special forces, and the increase in ground mobility through the use of helicopters, laid the ground work for the kind of effort that had to be made in Vietnam. He did that in advance of the larger phase of the conflict. I think he deserves credit, as well as those associated with him.

In mentioning helicopters, I did not even know that you were involved in the helicopter decision. But I mentioned three items in my opening comments only to make the point that it seems to me it is really hard to wage a war and try to always come out even on equipment, supplies and trained personnel.

I think if past experience is any guide, in a war situation you need a little fat in order to deal with the situation as it may unexpectedly develop. I don't mean inordinate surpluses. But every conflict is different from the previous one. It is full of situations in which the element of surprise is a daily occurrence. Some kinds of surplus can be valuable insurance.

That is my comment.

Dr. ENTHOVEN. I agree, Mr. Chairman, that we should have a margin of safety, and I think we do. But I think that the surpluses, or the margin of safety, if it is to be usable, ought to be bought in balance. You should try to buy the airplanes and the bombs in balance with each other. My point on the helicopters was that the Army appeared to be getting out of balance. And of course I agree with you that we want to avoid inordinate surpluses.

To keep the supply situation in Vietnam in perspective, you should remember that General Westmoreland said—

Never before in the history of warfare have men created such a responsive logistical system—one that is capable of supporting a flexible strategy that creates sudden requirements from widely scattered points. Never has there been such zealous participation by logistical troops who believe in the importance of

full and fast support for the combat elements. Not once have the fighting troops been restricted in their operations against the enemy for want of essential supplies.

I think that gets to the question Senator Baker raised about the bombs. There probably were times when planes were available that could have carried and dropped more bombs if more bombs had been available.

You can't win in this business! Instead of being attacked for an "airplane surplus" we are attacked for a "bomb shortage."

We are trying to buy bombs and planes in balance.

Senator BAKER. The thrust of my questions and the reason for my inquiry was not to pin blame for a bomb shortage or a fuse shortage or even for the logistics, but rather because your statement, Doctor, was in effect, "You can't say there was a bomb shortage when we were dropping two and a half times the amount of bombs we were dropping in Korea."

My response was, my reaction is, that that is a distinction without a difference. I don't think if PPBS is based on the judgment of some prior conflict or of some abstract quality or quantity, on some theoretical basis, it is truly responsive to the needs of this conflict.

The reason for my inquiry was not to establish or to dispel the idea of a bomb shortage in the spring of 1966, but rather to see how PPB, the entire logistical system and the procurement program, are tied to the real test of the moment, and to the judgmental factors of the military, as distinguished from prior data that may have been gathered from Korea or some place else.

Dr. ENTHOVEN. The supply of bombs we had by the Spring of 1966 was the result of decisions made in previous years. The decisions on bomb procurement from 1962 onward were aided by PPBS. Partly as a result of the analyses that were done on bomb requirements, and partly out of recognition of the importance of getting modern non-nuclear ordnance, the Secretary of Defense gave a great deal of encouragement to the Services to build up their inventories, and they did so.

I grant that you are absolutely right that the fact that we were dropping 35,000 tons in comparison with the 17,000 tons we were dropping in Korea, is not proof of whether or not there was enough. It is just a rough way of putting the matter into perspective. The evidence of whether or not there was enough would be statements like the ones made by General Westmoreland and others that "not once have the fighting troops been restricted in their operations against the enemy for want of essential supplies."

SPECIALISTS AND GENERALISTS

If I could go on, Mr. Chairman, to some of the other points you raised in your opening statement, you talked about specialists and generalists. I am very much in favor of the broad decisions being made by generalists, not specialists. I think that the main purpose of PPBS is to help the generalists by organizing the information in such a way that it will be meaningful to them.

Let me give you an example. Back in 1961, I was taking part, as an observer and critic, in a study of strategic nuclear force requirements.

The estimates of requirements were being based on the probabilities of damage that different forces could achieve against the various lists of strategic targets. I felt that a list of probabilities of damage would be very difficult for a generalist, or for a politically responsible official, to interpret, make sense out of, and to judge. So I encouraged the people doing the study to translate these numbers, that were not meaningful to the generalists, into numbers that would be, like the number of Russians and Americans that would survive, etc.

Similarly, back in 1961, the Army was basing its recommendation to put Nike-Zeus into production on the ability of one anti-missile missile battery to knock down one reentering ICBM. Some felt that at that point, they had solved the problem. That is, some were saying, "We now have a successful anti-missile defense because one of our batteries can shoot down one reentering missile."

The job of Systems Analysis was to say to these specialists, "Look, the President and the Secretary of Defense, and the Congress, cannot be expected to judge the issue on the basis of such a narrow and technical view of the problem. We have to translate these calculations into an estimate of how many Americans would be saved in total when the total Soviet force is applied against the total American defense posture."

We developed such estimates. Mr. McNamara has presented them to the Congress in his posture statements.

I believe very strongly that PPBS is on the side of the generalists. Its main purpose is to translate the specific technical criteria of the specialists, that are not meaningful to the generalists, into terms that are more understandable by the generalists.

Next, Mr. Chairman, let me say that I share your concern over the current faddism with "scientific management"; but I don't think that it should be confused with PPBS. There is a literature on management science and operations research that includes books and articles that give the impression that their authors believe serious problems of decision can be reduced wholly to calculation. I thoroughly disagree with that idea, and I want to make it clear that it is not a part of the Planning-Programming-Budgeting System of the Department of Defense.

Next, Mr. Chairman, with respect to Mr. Hitch, I am very glad to hear that no attack on him was intended, and I regret it if I drew the wrong conclusion. The reason I drew the conclusion I did is that quotations from Mr. Hitch and from the President of the United States were the only specific examples used to illustrate the point that the author of the memorandum thought that PPBS was being oversold.

I recognize that any use of quotations out of their context to prove a point has the danger of misleading the reader. I felt that in this particular case it would be safe for me to use brief quotations because I could assume that the reader of my statement would have the *Initial Memorandum* available to him at the same time. Moreover, I meant the quotations not as proof, but as illustrations of the charges to which I was referring. I am very glad to know we all agree that Mr. Hitch

is a very outstanding public servant, and not a technical specialist or a PPBS zealot.

IEWS ON "COST-EFFECTIVENESS" STUDIES AND PPB

With respect to Admiral Rickover, I have the highest regard for Admiral Rickover's technical achievements in the design and building of nuclear power plants. I think that, within his specialty, he has contributed a very great deal to the defense of the United States. I think that his power plants represent a very major technical achievement. We are all very grateful to the Admiral because we know that his systems work reliably.

However, before making some of the statements that he did about "cost-effectiveness" analysis, I do wish that Admiral Rickover had read what Mr. Hitch and I have said over the years. I believe he should have done so.

In his testimony before Congress in 1966, which is reprinted in *Selected Comment on Planning-Programming-Budgeting* published by this committee, Admiral Rickover said: "The basis for using cost-effectiveness studies as the rationale on which to make a decision is the assumption that the important factors can be expressed in numerical form and that a correct judgment of the situation can then be calculated mathematically."

Mr. Chairman, from the very beginning of our participation in this work, Mr. Hitch and I have frequently made statements that are the very opposite of that. I could give many examples. Let me quote a statement that I made in 1962. I emphasize this date to show you this is not a latter-day conversion that I have just experienced but something that Mr. Hitch and I have been saying from the outset.

In one talk that I gave I said:

But as I criticize the non-quantitative approach to defense policy-making, I also want clearly to disassociate myself from the other extreme. Analysis cannot supplant decision-making. Defense policy decisions cannot be calculated. No set of calculations alone can logically imply that the United States should have "X" divisions or "Y" ICBM's; no set of calculations alone can logically imply that we should follow a "finite deterrence" or a "counter-force" strategy. I want to make that point because I have gotten the impression that some operations researchers believe that such calculations can be made.

I emphasized this point also because there seems to be so much misunderstanding about the quantitative analysis being done in the Department of Defense. Some critics seem to believe that defense policies are being made on computers and that "optimal strategies" are being calculated on slide rules. Nothing could be further from the truth. Our approach is simply based on a belief that quantities are relevant and have to be considered carefully in the making of policy decisions. As far as I know, no responsible Defense official believes that it is possible to calculate the answers to major national security policy questions.

Mr. Chairman, with your kind permission, I could provide some of these statements.

Senator JACKSON. You can include them in the record, or anything else that you want to on this point.

Dr. ENTHOVEN. I think Charlie Hitch and I have tried very hard to make it clear that we don't believe what Admiral Rickover seems to think we believe.

(The statements referred to follow:)

LIMITATIONS OF THE PPB SYSTEM

Comments by Dr. Alain C. Enthoven

*May 16, 1962*¹

But as I criticize the non-quantitative approach to defense policymaking, I also want clearly to dissociate myself from the other extreme. Analysis cannot supplant decision-making. Defense policy decisions cannot be calculated. No set of calculations alone can logically imply that the United States should have "X" divisions or "Y" ICBM's; no set of calculations alone can logically imply that we should follow a "finite deterrence" or a "counter-force" strategy. I want to make that point because I have gotten the impression that some operations researchers believe that such calculations can be made.

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To the extent that major national security policy problems are quantitative in character, calculations are relevant. Of course, there are many things that simply cannot be calculated; for example, the reliability of an ally, or the psychological and political consequences of a military operation. And these non-quantitative factors may dominate the problem. But there are also many things that cannot be done intuitively or based entirely on experience. Intuition and experience unaided by calculations will not tell us how many ICBM's are needed to destroy a target system, nor will they tell us how many C-141's are required to move a division. For most of these questions a mix of calculations, intuition, and experience is required. One of the biggest challenges facing us today is how to find ways of blending these factors better in those areas in which unaided calculation is weakest.

Another journalist has claimed that it was a computer, and not the judgment of the Secretary of Defense, that prevented the RS-70 from being put on full weapon system status. Now this claim is simply wrong. I don't doubt that someone on the Secretary's staff may have required an adding machine to add up all the costs, or that possibly a computer was used in the combining of the kill probabilities that showed that forces already programmed can kill a very high percentage of the strategic targets. But to argue from this that the RS-70 was "done in" by computers is worse than foolish. It is dangerous. It does the country a great disservice by obscuring the nature of defense policy decision-making and confusing the thinking of the public. If there is anything we badly need in the national security business it is greater, not less clarity of thought about the nature of our problems and how to solve them.

*June 6, 1963*²

And it is only in very recent years that it (Systems Analysis) has been taken seriously by top-level decision-makers. I think that it is fair to say that one can find some good, thorough, reliable analyses that deserve to serve as a guide to serious decision-making. Unfortunately, however, one can also find many bad ones. My general impression is that the art of systems analysis is in about the same stage now as medicine during the latter half of the 19th Century; that is, it has just reached the point at which it can do more good than harm, on the average. Of course, it would be no more sensible to conclude from this that we should not develop and use systems analysis now than it would have been to conclude that we should not use medicine then.

Do judgment and experience have no place in this approach to the choice of weapon systems and strategy and design of the defense program? Quite the contrary. The suggestion that the issue is judgment versus computers is a red herring. Ultimately all policies are made and all weapon systems are chosen on the basis of judgments. There is no other way and there never will be.

¹ Operations Evaluation Group Vicennial Conference, Washington, D.C.

² From address before the Naval War College, Newport, R.I.

The question is whether those judgments have to be made in the fog of inadequate and inaccurate data, unclear and undefined issues, and welter of conflicting personal opinions, or whether they can be made on the basis of adequate, reliable information, relevant experience, and clearly drawn issues. The point is to render unto computers the things that are computers' and to judgment the things that are judgment's. In the end, there is no question that analysis is but an aid to judgment and that, as in the case of God and Caesar, judgment is supreme.

LIMITATIONS OF THE PPB SYSTEM

Comments by Charles J. Hitch

*March 1960*³

It cannot be stated too frequently or emphasized enough that economic choice is a way of looking at problems and does not necessarily depend upon the use of any analytic aids or computational devices. Some analytic aids (mathematical models) and computing machinery are quite likely to be useful in analyzing complex military problems, but there are many military problems in which they have not proved particularly useful where, nevertheless, it is rewarding to array the alternatives and think through their implications in terms of objectives and costs. Where mathematical models and computations are useful, they are in no sense alternatives to or rivals of good intuitive judgment; they supplement and complement it. Judgment is always of critical importance in designing the analysis, choosing the alternatives to be compared, and selecting the criterion. Except where there is a completely satisfactory one-dimensional measurable objective (a rare circumstance), judgment must supplement the quantitative analysis before a choice can be recommended.

*September 4, 1962*⁴

Now, I do not wish to leave the impression that we believe that "optimal strategies" can be calculated on slide rules or even high-speed computers. Nothing could be further from the truth. Systems analysis is simply a method to get before the decision maker the relevant data, organized in a way most useful to him. It is no substitute for sound and experienced military judgment and is but one of the many inputs to the decision maker. And, indeed, most of the system analysis work is done at the military levels of the Defense establishment . . .

In conclusion, let me emphasize once again; the new approach to the planning-programming-budgeting process will not in itself make the hard decisions easy or the complex problems of formulating the national defense program simple. It will not substitute for the collective military wisdom and experience of the Joint Chiefs of Staff, or the administrative and organizational skills of the Military Departments, or the technical knowledge and judgment of our scientists and engineers, or the professional know-how and leadership of our commanders in the field. What we hope it will do is to harness all of their efforts to the one overriding objective of the military establishment—the defense of the Nation.

*July 25, 1962*⁵

Like any other management device, cost-effectiveness studies can be misused and abused. If the objectives or costs or measures of military effectiveness are wrong, the answers will also be wrong. Furthermore, they are not immune to subjective bias, particularly where the element of judgment is important. But this simply means that care must be taken in interpreting the results. We recognize that there is an element of judgment involved in almost all decisions of the Defense Department, but we want to keep the area of unsupported judgment to a minimum. This we can do by encouraging systematic cost-effectiveness studies at all levels of the department while constantly striving to improve their quality.

³ RAND Corp. publication, *The Economics of Defense in the Nuclear Age*, Charles J. Hitch and Roland N. McKean, R-346.

⁴ Remarks of Assistant Secretary of Defense Charles J. Hitch before the National Advanced-Technology Management Conference, Seattle, Washington.

⁵ Statement before the Military Operations Subcommittee of the House Committee on Government Operations.

*April 5-9, 1965**

I pointed out in my second lecture that, even at the Secretary's level, we cannot manage all of the Department's activities solely in terms of programming. The pay, allowances, and other benefits of military personnel are prescribed by law, generally not with reference to particular assignments but, rather, in terms of an over-all career development pattern. Accordingly, we have to manage our military manpower in the aggregate, by grade, skill, etc. as well as in terms of program elements, such as B-52 wings or Army divisions.

There are many other areas, such as procurement policies and procedures, which cannot be effectively managed in terms of program elements. Still another management tool introduced in the last few years is the Department-wide Cost Reduction Program, a highly structured program with its own detailed goals, reporting channels, and post-audit system.

Finally, we must appreciate that the management tools needed by the Secretary of Defense may not necessarily suit the needs of management at the lower levels. For example, the financial data required by the commander of a military base to carry out his mission differ markedly from that required by the Secretary.

But all of these diverse organizations and functions must be harnessed together into a single effort directed toward a single over-riding objective—the defense of the Nation, and this is the purpose of the planning-programming-budgeting system.

But let me hasten to say that systems analysis or cost-effectiveness studies are by no means a panacea for all the problems of defense. Costs in general can be measured quantitatively, although not always with the degree of precision we would like. Measuring effectiveness of military worth poses a much more difficult problem. Reliable quantitative data are often not available. And even when such data are available, there is usually no common standard of measurement. This is particularly true with regard to systems analyses involving complex new technologies. Here, even reliable cost data are seldom available. Accordingly, the preferred alternative can rarely, if ever, be determined simply by applying a formula.

PPBS AND CONGRESSIONAL REVIEW

Senator JACKSON. First of all, I want to thank you for your comments on my comments.

With respect to Admiral Rickover, I am confident that history will accord him an honored place as a formidable, creative contributor to our national safety and freedom. From the outset of the historic fight for nuclear power for the Navy the Admiral has been out in front with prescient advice and with sound, broadly-conceived programs for the power plants, trained personnel and operation of our nuclear submarines and nuclear surface ships. Some people are just beginning to catch up with him.

With reference to the specialist, it seems to me that he has the responsibility to try to give the generalists the detailed information in a way that the generalist can fully understand the issues and the implications. The generalist needs the kind of information and policy analysis from the specialist that is suitable for the subject matter up for decision.

In this connection, I think the specialist has a particular responsibility to make a full disclosure of his assumptions and premises, so that the generalist understands the assumptions on which certain data and conclusions are being submitted. This is my point.

Dr. ENTHOVEN. I agree with that, Mr. Chairman.

Senator JACKSON. The generalist in government is, of course, increasingly dependent on the specialist, and the specialist can be of invaluable help to the generalist.

* H. Rowan Gathier Lectures in Systems Science delivered at University of California.

Dr. ENTHOVEN. I agree with that, Mr. Chairman, and I think that this relationship is a serious problem in our society. I think that what we call Systems Analysis is an attempt to respond to just that problem: that is, to translate the detailed technical material into information that will be intelligible to the generalist. I think that is what Systems Analysis is all about.

Senator JACKSON. As to PPB and systems analysis, I hope that these hearings and the information developed in our study will help the public and the people more directly involved gain a more balanced view of the techniques. Neither I nor our staff, of course, have ever "expressed the fear that PPBS was a scheme conceived by experts to take power from politicians."

There are valuable possibilities in these techniques and procedures; there are also dangers inherent in them. As I understand Mr. Hitch's position, he has been concerned, at least in some instances, that the over-enthusiastic might move too far too fast in applying the techniques and thereby might discredit the techniques. He has sounded some sensible cautionary notes, and has not claimed that PPB would work wonders in all corners of government that it obviously could not work. This is my general view of his position.

Dr. ENTHOVEN. I don't think there is any danger of the specialists or the over-enthusiasts taking over since the management is always going to be in the hands of the elected officials.

Senator JACKSON. We have a system of checks and balances, and our democratic government is based on the principle of executive accountability and Congressional oversight and review. The process of review, I think, is underway in these hearings. We are trying to get the basic issues involved in these tools and management techniques out on the table to encourage, to the extent that we can, a balanced view of their value.

Senator Mundt.

DID PPB OR SYSTEMS ANALYSIS PLAY PART IN VIETNAM BARRIER DECISION?

Senator MUNDT. I was a member of the Appropriations Committee, Doctor, to which was presented this new and apparently rather controversial device of establishing a zone to sterilize the area between North and South Vietnam. An appropriation was asked. While no single member of the committee present expressed enthusiasm for it, we did give you the full amount of the money requested because we did not want to be in the position of vetoing something in which we did not have confidence, but on which the Defense Department seemed to place a lot of emphasis.

I was wondering what part PPBS played in evaluating and advising on the establishment of such a zone. I am not sure what official name you use for this concept. How do you identify it, Doctor? You don't call it a Maginot Line, but there is some name that describes it.

Dr. ENTHOVEN. It is referred to as a barrier.

That has been primarily a technical and military operational question: PPBS as such has played no part in the barrier.

I might add, Senator, that I have not worked on the barrier myself, and for reasons of military security, Mr. McNamara has asked that

nothing more be said about it than has been said in his own public statement.

Senator MUNDT. It was brought up in executive session. We were privileged to hear only from the dedicated proponents of this concept. We heard scuttlebutt and rumors that a lot of military people looked at it with jaundiced eyes, but they did not testify before us.

In line with Senator Jackson's earlier question, there must have been a lot of discussion, there must have been some pros and cons, in arriving at this decision. This is one of the questions where I think it would have been good if the Congress could have had the advantage of listening to the reasons which those who opposed the concept gave for their opposition—if there were such people, and we were led to believe that there were.

Dr. ENTHOVEN. I am sorry, Senator, I am not in a position to comment on the barrier.

Senator MUNDT. Some place along the line the President had to give approval to this concept, did he not?

Dr. ENTHOVEN. That seems to me to be a reasonable assumption, but I don't really know. I was not involved in that question, so I can't give you any factual information.

Senator MUNDT. If you don't know that, then you probably would not know the answer to my follow-up question as to whether or not he sat around the table and listened to the pros and cons, and had evidence on both sides before him, or whether he was presented with the paper advocating this and gave his acquiescence.

I agree with you that not knowing this, it is almost an axiomatic assumption that some place along the line a departure of this kind had to receive a Presidential okay.

Dr. ENTHOVEN. I would find it very hard to believe that it did not get a Presidential okay, and from what I have seen of the President, it is clear to me that he does make quite a point of getting all sides heard and all opinions aired.

But I have to say again, Senator, that in this particular case I am not informed.

DECISION-MAKING PROCESS ON DEFENSE ISSUES

Senator MUNDT. Forgetting this case, and making it more general, are you intimately familiar with the process by which the President gets all points of view? Is there a seminar discussion such as we have around this table? Is it a matter of papers presented to him, through the channels of the Secretary's office?

What is the *modus operandi* by which he is apprised of all the points of view? I am not referring to this barrier concept but to the general process of decision-making.

Dr. ENTHOVEN. Senator, I am not intimately familiar with the process. I do know something about it, and I would be happy to tell you what I know. Secretary McNamara's Draft Memorandums for the President are reviewed and commented upon by the Secretaries of the Military Services and by the Joint Chiefs of Staff, and subsequently by the President's other advisors in the national security area in particular, the Secretary of State, the Director of the Bureau

of the Budget, the President's Science Advisor, and his Assistant for National Security Affairs.

Late in the budget season each year, a letter is prepared that indicates clearly the points of agreement and disagreement, so all of these officials are able to record their views.

Then, each year the President meets with these men for discussion. In particular, each year he meets on the Defense budget with the Secretary of Defense and the Joint Chiefs of Staff. They do have a thorough airing of these issues.

I have never attended those discussions; I am not at a high enough level in the Department to do so. But I do know from the staff papers we prepare that all points of view are reflected. One of my jobs is to take the letters around to the various people and get their agreement that the letters state their positions accurately on the issues they want to carry forward.

Senator MUNDT. There is some concern, and it may be valid or not, but I have heard it expressed, that the PPBS system tends to arrive at conclusions which are presented to the Chief of Staff, to the White House, to the Commander in Chief, rather than to bring up to their attention the range of alternatives and the raw material for their consideration.

I don't know if that is a valid concern or not, but I have heard it expressed.

Dr. ENTHOVEN. I am very glad that you raised that point, Senator, because it is something I would like to have a chance to comment on and clear up.

I believe it is fair to say that the staff system that was in operation before PPBS, for the most part, was designed to suppress alternatives as the paper or issue worked its way up the chain of command in the staff so that the Chief of Staff or the Secretary of Defense was presented with a staff position which he could accept or reject. That was the classical concept of staff work. One of the innovations that Secretary McNamara emphasized and that we made a part of the PPBS approach, was that the top officials would see the various interesting alternatives explicitly stated and they, themselves, would apply their thought to the major alternatives.

Now the various available alternatives are systematically analyzed and presented to the Secretary of Defense and the Joint Chiefs of Staff.

The principle that the men at the top will see all the important alternatives, so that they can exercise some choice, rather than just accepting or rejecting a staff position, is fundamental to the system.

Senator MUNDT. I am glad to have your explanation. That is all, Mr. Chairman, for the time being.

WHY NOT MORE HELP FROM SCHOLARS AND STRATEGISTS ON VIETNAM?

Senator JACKSON. I have a few questions.

As you well know, there are a large number of civilian strategists and systems analysts in this country—in the non-profit corporations like RAND, in universities and in Defense. They have addressed the problems of thermonuclear war, deterrence, and defense, and debated and promoted strategic theories at length. By and large, however, they

have had little to say about Vietnam, counter-insurgency and so-called “wars of national liberation.” My question is: Why?

Dr. ENTHOVEN. That is a good question, Mr. Chairman. I would guess that there are two main reasons. One is that, for most of the period we are discussing, that is, the past twenty years, the problems posed by nuclear weapons seemed to be the most important problems of national defense. In the public debates and discussions on the big issues of national defense in the 1950's, for example, I think, for the most part, that is what people were talking about.

When I went to the RAND Corporation for the first time in 1955, I believe that most people there thought that the problem of thermo-nuclear weapons was the main national security problem that had to be dealt with.

That is one reason.

The other reason is that nuclear strategy is more amenable to analysis. Because the consequences of a nuclear war depend largely upon the performance of relatively few machines, questions of nuclear strategy can be illuminated by calculation and measurement. On the other hand, counter-insurgency and so-called “wars of national liberation” are decisively questions of the motivations of people which, of course, are not susceptible to much calculation at all.

Senator JACKSON. In this connection let me quote a statement by Amrom Katz, a Senior Staff Member of the RAND Corporation. Maybe you would like to comment on it, because it relates to this very matter:

... when two decades ago the problem of nuclear war began to be addressed, everyone got off the starting blocks at the same time. Who had experience? *No one.* The problems addressed were those amenable to analysis and discussion, and the race went to those whose logic, tongue and pen were fastest.

One should hesitate long and hard before proposing solutions to a real problem, where others did get off the starting blocks early, where others have had relevant experiences, and where the problem requires more and different tools, data, and insights than can be supplied only by logic, wit, and the standard tool kit of the strategist.

Real war does many things—and Vietnam is a complex furnace that can reduce to ashes fine theories invented elsewhere and not grounded in relevant experience.

Let me add this further comment. By 1955, of course, we had had the experience and warning of lesser wars, namely Korea. In the 1950's our adversaries were advising us that they were going to follow the course of limited wars, so-called “wars of national liberation”, so we were alerted by then, or should have been. I think one of the great things Secretary of Defense McNamara did when he came into office was to recognize the threat of limited engagements and the possible direct military involvement of the United States in this kind of conflict.

We have been actively in Vietnam for some years.

We have had plenty of notice. Why have not the scholars and strategists done more work on these tough problems of limited war or counter-insurgency or so-called “wars of national liberation?”

Dr. ENTHOVEN. That is a very good question.

First of all, I think in fairness to the scholars it ought to be said that some were working on the problems of economic development and the transition from primitive societies to modern industrial societies with sustained economic growth. For example, we were doing work on

economic development at RAND, although it was not being given the same emphasis as nuclear weapons.

Let me check into this and supply a statement for the record.

(The statement follows:)

From 1955 on, The RAND Corporation had from 50 to 100 people working on problems of limited war. The list of publications is long. The following references indicate the range of topics under study.

Bernard Brodie, *The Meaning of Limited War*, RAND Corp. Research Memorandum, 1958.

A. M. Halpern and H. B. Fredman, *Communist Strategy in Laos*, RAND Corp. Research Memorandum, 1960.

Charles Wolfe, *Foreign Aid: Theory and Practice in Southern Asia*, 1960.

Paul Clark and Charles Wolfe, *Alternative Force Postures in Vietnam*, RAND Corp. Research Memorandum, 1961.

George Tanham, *Communist Revolutionary Warfare: The Vietminh in Indochina*, 1961.

I think one of the problems, Mr. Chairman, was that many many people thought that nuclear weapons were the solution to our national security problems in the decade right after World War II.

Even in the first half of the 1960's we had a lot of very tough debates on this problem within the Pentagon. One of the main things that our studies at RAND in the 1950's convinced people like Wohlstetter, Rowen, Hoffman, Hitch and myself of, was that nuclear weapons were not the solution to all of our national security problems. We spent a lot of time trying to drive that point home.

I think you raise a very good question. It probably would have made more sense if more of that effort had been put into studying the things that would be the solution to some of our other national security problems. But you can't get far with a solution until you get people to recognize the problem.

I have a favorite joke about this. I think it is a joke on all of us—I don't mean just the people from RAND—I mean all of the scholars and all branches of government. It concerns the drunk who was crawling around under a lamp post looking for something. A man came along and said "can I help you?" The drunk said "yes." The man said, "what are you doing?" The drunk said, "I am looking for my keys." The man said, "where did you drop them?" The drunk said, "down at the other end of the block." The man said, "well why are you looking for them here?" The drunk said, "because the light is better here."

Senator JACKSON. That is very apt.

Dr. ENTHOVEN. It is a problem we all face. I am afraid that in 1956 the light seemed a little better on the ICBM's than it did on the guerrillas in Vietnam.

Senator JACKSON. It was more dramatic. You had Sputnik and all the spectacular weapons developments.

Dr. ENTHOVEN. That is right.

Senator JACKSON. One thing that has always bothered me, Dr. Enthoven, is this: I have had the privilege of attending for a day or two some of these institutes, symposia and strategy seminars. The hard, tough problems that are involved in dealing tactically, strategically, and politically with "wars of national liberation" are generally avoided. Emphasis is almost always on hardware and numbers, etc.

Dr. ENTHOVEN. Where the light is better?

Senator JACKSON. At least where the light seems better.

I do want to say that the scholarly community knew, or should have known, that we would have to prepare ourselves for these limited conflicts.

I emphasize that we have basically done a good job, overall, in procuring the military equipment and the materiel to fight this type of conflict. But I don't think the scholars or the strategists have addressed themselves with much practical success to the really tough tactical, strategic and political problems that are involved in the Vietnam type of war.

Senator Baker.

ROLE OF PPB IN DEFENSE PROGRAM DECISIONS SINCE 1961

Senator BAKER. Thank you, Mr. Chairman. Doctor, in your prepared statement in the section you entitle "Achievements of PPBS in the Department of Defense," I get the impression that you attribute virtually all major defense program decisions since 1961 to the PPB system.

Dr. ENTHOVEN. In our discussion last time, we established the fact that the PPB system we are talking about now was in a prototype stage in 1962, and in more or less full operation by 1963. That is an approximation to a complex development. You can't say one day we did not have it and one day we did. I do think it is fair to say the system we are discussing today was not close to full operation before 1963.

Senator BAKER. And the system is still growing and developing?

Dr. ENTHOVEN. We are still developing it, that is right.

Senator BAKER. I have read part of an article by William Niskanen, of the Institute of Defense Analyses, printed in *Defense Management* (1967), edited by Stephen Enke.

He makes a strong case to the effect that major defense program decisions from 1961 until the beginning of the real Vietnam build-up in 1965 cannot and should not be attributed to the PPB system, but rather were made on the basis of objectives defined, ideas developed, and analysis performed before the effective operation of the new management techniques.

Would you care to comment on that? Are you familiar with the article I have referred to?

Dr. ENTHOVEN. Yes, though it has been a long time since I read the article, and when I did it was in a hurry, Senator. I recall at the time objecting strongly to the article and telling Dr. Niskanen that in my judgment it included some bad misinterpretations of what had in fact been going on.

With respect to the question of whether the major decisions made before 1965 were influenced by PPBS or not let me say this: It is difficult to sort out all of the influences, especially because PPBS came into the Defense Department at the same time that people came in who had views about the need for a basic change in defense policy and strategy, especially the importance of increasing our non-nuclear forces.

Senator BAKER. Dr. Niskanen makes the point that to judge the effectiveness and the extent of the utilization of PPBS you ought to look at the FY 1963 defense budget of \$51.9 billion—and the commitments and programs within that budget—which he believes includes most of the major force-level decisions that remained in effect until the 1965 Vietnam build-up. The FY 1963 defense budget was prepared during 1961 and submitted to Congress in January 1962. This was before the PPBS got into play, and therefore, I take it, PPBS has not played as big a part in defense planning and operations as might appear.

Dr. ENTHOVEN. The major changes in the shape of the defense budget made by the new Administration in 1961 came pretty quickly and only partly with the help of PPBS. I am referring to the major changes in strategy, the speed-up in production of Minuteman and Polaris and the build-up in our non-nuclear forces, including the increases in the Army, the tactical air forces and airlift.

Senator BAKER. They antedated PPBS?

Dr. ENTHOVEN. Yes. They were being phased in at the same time that PPBS was being phased in.

Senator BAKER. The thrust of Dr. Niskanen's article is that these decisions in 1961-62 on the general posturing of those budgets which are essentially our present budgets were not strongly affected by PPBS.

Dr. ENTHOVEN. I think the dominant influence on the shape of the budgets was views about strategy. We speeded-up the Polaris and Minuteman programs because we believed that it was terribly important to have an invulnerable retaliatory force. We built up the Army Land Forces because we believed it was necessary to have more land forces for limited non-nuclear wars. We speeded-up the development of anti-guerrilla forces or special forces because we believed that was necessary for counter-insurgency.

Those things would have happened with or without PPBS. PPBS does not make the strategy. The strategy is based on the judgments of the people who are responsible for shaping it. PPBS is a management system that gives them better information on which to base their judgments, and a better system for controlling the execution of their decisions.

Senator BAKER. I am not trying to put words in your mouth, but succumbing to a natural tendency to mediate between two conflicting points of view, would it be fair to say that the principal function of PPBS has been to adjust and modify previous overall gross commitments in the defense posture that were arrived at without substantial influence from PPBS?

You have used PPBS to refine and modify previous commitments rather than to create these commitments.

Dr. ENTHOVEN. I agree with that, if you mean the very large gross commitments. But when we get down to the level of a few billion dollars for this or that program, I would say that PPBS has become quite important. For example, the decision whether or not to go ahead with Poseidon was given the PPBS treatment. The Poseidon proposal got a speedy and favorable decision because simple calculations showed that it was clearly a good thing to do. That was a

multi-billion dollar decision. But I think it is fair to say that the larger context that led to it, which was a broad policy that we would have an invulnerable retaliatory force, was a major strategic decision, larger than PPBS.

VIETNAM BARRIER CONCEPT

Senator BAKER. Let me talk about this barrier concept that you mentioned a moment ago. I got the impression from the exchange between you and Senator Mundt that PPBS has not been involved at all in the judgment of the merits of this barrier concept.

Dr. ENTHOVEN. That is correct.

Senator BAKER. Is that so, or is it just that you are not at liberty to tell us one way or the other?

Dr. ENTHOVEN. That is so.

Senator MUNDT. Will you yield at this point?

Senator BAKER. Yes.

Senator MUNDT. Why is that so? That is a novel, and controversial decision. It seems to me that all the analysis and know-how of PPBS should be used before we make the decision.

Dr. ENTHOVEN. Can we go off the record for a moment?

Senator JACKSON. Certainly. Off the record.

(Discussion off the record)

Senator JACKSON. Now back on the record.

PROBLEM OF TESTING SYSTEMS ANALYSIS METHODS

Senator BAKER. My next question is how do you test this system and your systems analysis methods and how do you make corrections or improvements?

Do you ever go back and do an analysis taking a set of events that have previously already occurred and seeing what your systems analysis methods would have come up with or predicted under those circumstances?

Dr. ENTHOVEN. I think if I went back and reexamined with hindsight the analyses done in my office, you wouldn't be able to count on my doing in all respects a fully impartial job. What we ought to do, and what I hope we will be able to do, is get impartial scholars from the outside to come in and write case histories.

Evaluating a decision made in the past is a complicated matter. To do it properly, you should separate what the decision maker knew and what he should have known at the time from what only became known later. A man might do an excellent job of analyzing a problem and reaching a decision, on the basis of the information available, only later to have it turn out badly because of something he couldn't have known at the time. Another man might do a bad job of gathering and evaluating information, and make a decision that looks bad on the basis of the information then available, only to have it turn out well because of some new factor that couldn't have been foreseen. In evaluating a decision made in the past, you should try to separate the quality of the man's thought from his luck. I believe that on the average, better thought will lead to better decisions. Poor thinkers aren't luckier than good ones.

Some people say that we would not have developed Polaris if we had used cost-effectiveness analysis at the time. I don't believe that. I can cite as evidence to the contrary the fact that we did develop Poseidon, and we speeded up Polaris. But nobody can prove such a hypothetical statement one way or the other.

I think it would be pretty hard to get very clear-cut results by going back to earlier historical cases. For example, the people studying the decision to go ahead with the atom bomb couldn't help but have their judgments colored by the fact that it turned out to be a success.

So it is hard to get a good laboratory test, although it is a very interesting question.

THE SKYBOLT CASE

Senator JACKSON. Thank you, Senator Baker, and Senator Mundt.

I have a question or two and then I will ask Dr. Tufts if he has any questions.

In the PPB system, as you describe it, if the political analysis and foreign relations considerations do not get in early, they may not get in in time. Isn't this really the important lesson of the Skybolt case? If as you say, allowance was made for the impact on the British in the cancellation of Skybolt, then, the question is, why was the political problem handled so badly?

I recall Professor Richard Neustadt's earlier comments to this committee on this point. I want to quote from his testimony of June 29, 1965:

We had plenty of political sensitivity at the top, but it wasn't turned on until late. The net result was that we didn't focus our attention soon enough, or realistically enough, on the political problem our intended budgetary action was creating for the British Government. When we finally did focus, the problem had grown so acute we had to help them improvise its solution on a crash basis, which intensified still other problems for both of us.

What is now done to guard against the potential danger highlighted by the Skybolt case?

Dr. ENTHOVEN. One of the main things is close liaison with the State Department at the staff level. For example, each winter the previous year's budget decisions and Secretary McNamara's draft memorandums for the President, which were sent to Secretary Rusk, and which were reviewed in the State Department, are discussed systematically at the staff level by people in State, my office, and in the office of the Assistant Secretary of Defense for International Security Affairs. That forms a starting point each year for continuing contact and discussion through the year as the decisions develop.

Senator JACKSON. At what point does the Secretary's Presidential Memorandum device get into this process? When was the Presidential Memorandum device first introduced in the Defense Department?

Dr. ENTHOVEN. As a part of each year's budget cycle, we have discussions of the major force issues at the staff level with people in the State Department, beginning in the winter, and continuing to the time of decision at the end of the calendar year. They are continuing discussions, so I don't think there are any surprises. I don't believe that there was a surprise in the case of Skybolt. At least that was a punch that had been telegraphed frequently within the Pentagon as the costs skyrocketed.

Senator JACKSON. But was the message brought clearly to the attention of people in the State Department, so that those who were directly involved with our British ally, could be fully informed?

Dr. ENTHOVEN. Apparently not clearly enough. I think one cause of the problem was that one of the main lines of communication with the British on the Skybolt project was between our Air Force and the RAF. Of course, both Air Forces were very much hoping that the project would continue. It is possible that a clear understanding of the fact that Skybolt was in serious trouble was not communicated for that reason.

The point I wanted to emphasize in my statement was that there is no question in my mind but that the key people involved were very much aware of the fact that the cancellation of Skybolt would create a problem for the British government. That was one of the arguments that had been used at various times to keep the program going.

LEVEL-OF-U.S.-FORCES-IN-EUROPE ISSUE

Senator JACKSON. In connection with the problem of the level of American ground forces in Europe, and how to pay for them, how early in Defense Department planning were the diplomatic implications brought in? What sort of communications were there with the State Department? Do you recall that? Were you involved in those studies?

Dr. ENTHOVEN. Yes. The center of gravity on that was more in the State Department than in Defense.

Senator JACKSON. I am referring to the developments in 1966 prior to Mr. McCloy's coming into the State Department as a special advisor to the Secretary of State. You recall the Defense Department's efforts to get West Germany to keep up its off-set payments and the talk of a reduction in the number of American troops in Germany if we didn't get enough help in paying for them.

Dr. ENTHOVEN. There weren't any reductions in our forces in Europe, other than what had to be done in connection with the move out of France, before Mr. McCloy was brought in.

Senator JACKSON. No, there were no reductions during that period, but the point is the behind-the-scenes discussions, especially with the Germans, got into the public domain, and many of our best friends in Europe were taken by surprise.

Dr. ENTHOVEN. By the fact that there were discussions?

Senator JACKSON. Yes. These were going on early in the Defense Department and then with the Erhard Government. As you point out it isn't long before the news gets out. There was no advance consultation on this, as I recall, with most of our NATO partners and they were very uneasy at the talk of American troop reductions.

Dr. ENTHOVEN. Before we made any decisions to redeploy NATO forces to the United States from Europe, Mr. McCloy was brought in to review the whole question.

Senator JACKSON. I am referring to the period before Mr. McCloy was called in. He came into the picture as a result of all the uproar. The point I was making is that discussions were underway in DOD to see if we could reduce our forces in Europe, whether by redeploy-

ment or by actual withdrawal. Defense Department officials were talking with the Erhard Government and with some members of Congress. Many of our allies were taken by surprise by all this. There had not been proper consultation, which, of course, is the heart and soul of the Atlantic Alliance.

Mr. McCloy came in subsequent to all this in an effort to try to work out an appropriate solution, and to help calm the fears that had been left as a result of all the talk about cutting American combat forces in Europe.

Dr. ENTHOVEN. If there was anything wrong in what you describe, it was that some misleading information leaked. We cannot consult with our NATO Allies until we in the United States Government have made up our minds, at least to some extent, on the approximate direction in which we are interested in going. Before Mr. McCloy came in there was no agreement within the Government as to what ought to be done. The purpose of bringing in Mr. McCloy was to have an impartial person review the whole question, and see if he could help bring about agreement within the Government.

Senator JACKSON. I think it is important to talk to our allies at the very inception of these moves.

Dr. ENTHOVEN. Before we talked to the Congress?

Senator JACKSON. You can do it concurrently. I think it is important. I don't think you can avoid their getting the information from some source or other. We can let them know that we are in the process of reviewing a given matter, that we have not come to a conclusion but that we are studying it.

Do you see what I mean? This is one of the lessons we have learned.

It is unfortunate, but Government is big, and I think when you get into something as fundamental to Western security as this matter, especially when you are already talking to the Germans, failure to fully consult with your other allies is going to lead to a lot of unnecessary difficulty.

Dr. ENTHOVEN. The problem of prior consultation is a very tough one, because all of the key people, especially the leaders of the Congress and the foreign governments, want to be the first to be consulted. You consult with the first man and ask him to keep it a secret. Sometimes he leaks it. Then all the others complain that they weren't consulted before the decision was made public.

Senator JACKSON. I think you let allied leaders know that you are reviewing it. This is part of the whole business of consultation. As I understand, this is the very purpose of NATO's new force planning exercise and the new NATO nuclear planning group—to consult with our allies early, regularly, and at length about the design and deployment of the Western deterrent.

Dr. ENTHOVEN. In any case, once Mr. McCloy came in, we did develop an agreed position within the United States Government, and then Mr. McCloy reviewed the matter in great depth with the British and the Germans.

The whole question of what the deployments ought to be was reviewed in a joint study of unprecedented depth and quality. There was a thorough discussion with our allies before any decisions were made. What was done was done with their agreement.

Senator JACKSON. This, of course, was after the fact. It was done to allay allied fears, and to try to come up with a solution that would be acceptable. Mr. McCloy inherited a very difficult situation and he did an heroic public service in trying to salvage it.

Dr. ENTHOVEN. Are you referring to a leak from the Pentagon, or to statements by Senator Mansfield and others that we ought to be considering withdrawing?

Senator JACKSON. As I recall the record, in the fall of 1966 the public press was full of talk of possible reductions in U.S. forces in Europe. Mr. McNaughton of DOD had been up on the Hill and discussed this matter of possible troop cutbacks with a number of Members of Congress either informally or in committee discussions. DOD officials were actually encouraging the so-called Mansfield resolution which included the phrase "a substantial reduction of United States forces permanently stationed in Europe can be made without adversely affecting either our resolve or ability to meet our commitment under the North Atlantic Treaty."

Dr. ENTHOVEN. This is a very important question, but it is a question about the conduct of consultations and not really a question about the Planning-Programming-Budgeting System.

I thought the issue being raised about Skybolt and PPBS was whether the decision to cancel Skybolt was reached in the absence of the knowledge that this would create a problem for the British. I want to make it clear that, in the case of Skybolt or any other major weapon system decision that has political implications, I do think that the political factors get considered.

Senator JACKSON. I think it is a matter, though, of early communication with the State Department on these issues that obviously can lead to serious international problems. The level-of-U.S.-forces-in-Europe issue is another case in point.

Dr. Tufts?

LESSONS OF SKYBOLT

Dr. TUFTS. On this Skybolt case, apparently President Kennedy thought there was a failure of some sort, and asked Mr. Neustadt to study it to see where the handling of this issue had gone wrong.

You may be correct when you say that political considerations were not overlooked in the planning process, but apparently Mr. Kennedy felt they had not been given sufficient weight.

I have not seen the Neustadt report, but I take it the purpose of his study, as seen by the President, was to try to find out where the handling of the matter had gone wrong. In this connection I recall the testimony of Professor Neustadt before this committee on June 29, 1965, and the comments of Senator Robert Kennedy during that hearing.

Dr. ENTHOVEN. I believe that the main cause of the political problems arising from cancellation of Skybolt was the strong commitment to that system made by the Conservative Government. The decision to use Skybolt had been vigorously debated in Parliament. We did consult with them before announcing the decision to cancel Skybolt. I very much doubt that more consultation could have made a significant difference. In any case, the cause of the problem is certainly not to be found in the Planning-Programming-Budgeting System.

This is not to say there was not a problem. The questions of how you communicate with the leaders of other governments, which channels you use, when do you tell them what, and so forth, are important problems. But as far as the Planning-Programming-Budgeting System is concerned, the fact that there was a British interest in Skybolt was well known, and we were all very concerned about it.

One of the reasons for the timing of the decision—it was cancelled in December—was that the budget deadline was bearing down on us. It might have been better if we could have postponed the decision another month or two, while discussions were held with the British. But I very much doubt it. At the time, Skybolt was costing about a million dollars a day. Moreover, the budget had to be decided, and a very large amount of money would have been required if we were going to continue Skybolt. So the Government had to face it.

Dr. TURRS. I think this is worth exploring because I really don't know what to make of your answers always separating PPBS from the decision as a whole—telling us what PPBS may have been for, and others not for.

Dr. ENTHOVEN. No, I am not separating PPBS from the decision as a whole. I think PPBS was involved in the decision as a whole. I think PPBS helped to get the entire picture in front of the Secretary.

PPBS was concerned with the decision: Do we cancel Skybolt or not? I think it was concerned with the whole of the decision. I fully associate PPBS with that decision.

The decision to cancel Skybolt included a plan for consultation with the British, and consultation was held before the decision was announced. But PPBS is not a system for diplomatic consultation. That is done by a different part of the government.

Dr. TURRS. I am not asserting that it is, but apparently PPBS did not throw up to the decision makers the caution: Don't proceed to cancel this weapon until we have taken care of the diplomatic problems, because then the cancellation may very well be offset by the negative diplomatic and political costs.

Dr. ENTHOVEN. But it did. The PPBS did put up such a warning. Secretary McNamara, the President, and the rest of us were very aware of the diplomatic problems. But those problems had to be weighed against our own costs and political problems. I don't believe many American taxpayers would favor our wasting one million dollars a day to postpone—not solve—a problem for the British.

But the timing of the decision was really forced by the fact that we had a budget deadline to meet.

Dr. TURRS. I recall the comments of Senator Robert Kennedy in this committee in connection with Skybolt. He said the problem had been presented to both the President of the United States and the Prime Minister of Great Britain "too late."

There must have been some way around the budgetary problem, even leaving it in for the moment to gain a few weeks, and taking it out a short time later.

Senator JACKSON. Congress would not have been acting on it for some time and even the hearings would not have gotten under way until the latter part of January of the following year.

Dr. ENTHOVEN. The decision was made in December, and there are weeks involved in putting the budget together, once it is decided,

in order to meet the congressional deadline. Also, there were problems of prior consultation with the Congress.

Senator JACKSON. It seems to me there is a need for wise generalists to be involved very early in these weapons studies.

I am not talking just about Skybolt, but other programs too. They should be involved to give the Secretary of Defense or your counterpart in the Department of State, and the President, an early warning of the possible implications of such studies.

You have mentioned that when these studies get underway, the news gets all over the Department, and things leak out, and there are stories in the papers. Then the foreign government is upset, deeply concerned, about such information—and the President may have a crisis on his hands.

It seems to me that right at the genesis of these studies someone has to take a good look and say, "What are the implications of the study that we are making?" Is that not part of the lesson of Skybolt?

And certainly we should not rely too much at any stage in communications with the British on an issue like Skybolt, on a line between our Air Force and the RAF.

Dr. ENTHOVEN. The fact that there was an unfortunate political effect of this decision does not necessarily imply that the PPBS system was defective in this respect.

Senator JACKSON. I am pointing out the need for those who are working with the system to understand that a particular study can have implications well beyond the particular field of that study. This is the point. They become the catalyst.

Dr. ENTHOVEN. But we did understand that.

Dr. TURTS. But, you see, you are looking at it from your point of view. I think you have to look at it from the President's point of view. Whether there was something wrong with PPBS, or whether there was something wrong with something else, the system as a whole did not generate early enough for the President all of the information he needed to avoid a major crisis with the British and the unfortunate consequences which followed Nassau. Somehow he felt let down.

Dr. ENTHOVEN. The President looked at it from the President's point of view and decided to cancel Skybolt. The system did warn him that there was a serious diplomatic problem involved. There were problems in carrying out the decision, especially the consultation with the British.

But this kind of political problem, that is making a domestic decision that causes a problem for a foreign government, is something that can occur in any system. Would it make sense to imply that the Congress was politically unaware when it passed the Byrnes Amendment a couple of weeks ago and deprived the British shipyards of the opportunity to bid on construction of seven minesweepers? Did any members of this committee recommend consultation with the British Government before voting for a Defense Appropriation Act with that provision? The Byrnes Amendment was clearly a gratuitous slap at the British, and the British were very upset about it.

I think the unfortunate Byrnes Amendment was passed by people here who had a lot of complicated domestic problems to solve; and

that is the way the solution came out. But I would not then want to say, "Well, the congressional system that produced the Byrnes Amendment doesn't allow consideration of the political problems of the British."

I think it shows that there are inescapable dilemmas and contradictions in human affairs. The fact that some of the consequences of a decision are undesirable doesn't mean the decision wasn't nevertheless the best possible choice in the circumstances. And it doesn't necessarily mean that there was a defect in the management system that aided the decision.

Senator JACKSON. I think the system that was utilized did a good job in making a military evaluation of Skybolt, which led to the cancellation. The point I would like to emphasize is that when you are in the process of making that kind of an evaluation, from a military effectiveness point of view, it is incumbent upon those who are doing the study to take into consideration at the outset the other factors and possible implications, and to take appropriate steps to fully advise those who should be advised, at the inception of the study, and as the study proceeds. This is the point.

Dr. ENTHOVEN. I agree with that.

ROLE OF COMPUTERS

Senator JACKSON. I have one other question. You say in your statement, "The use or misuse of computers is too minor an aspect of this subject to be relevant to the serious concerns of this committee."

I was somewhat surprised by that statement. Certainly misuse of computers in defense decision making could have rather serious implications.

Dr. ENTHOVEN. I think the whole computer aspect of PPBS has been grossly over-stated.

I am not a computer expert, myself.

There is one man in my office who is a computer programmer, out of a professional staff of about 130 people. My staff includes economists, political scientists, philosophers, lawyers, physicists, mathematicians, business school graduates, all sorts of other people, but no computer experts.

I think the computer aspect of Systems Analysis has been very badly over-emphasized. I rarely talk about computers.

What I am trying to do is make very clear that computers are no more than a tool, like pencils, paper, telephones, desks. They are not at the heart of Systems Analysis.

If you ask "Then why have computers been so over-emphasized in their application to Systems Analysis?" I suppose it is because computers have struck the public imagination as something mysterious, exciting, and new. They make good copy.

Senator JACKSON. In quantifying data that must be quantified, a major error in the computer, of course, could lead to some bad results. Computers can make bloopers. That point, I think, is worth making.

Dr. ENTHOVEN. That is true. I agree with that. For that reason, we don't take the computer's word for anything. Everything that comes

out of the computer has to be reviewed and cross-checked. But sometimes it is easier to do your adding and multiplying with a machine than doing it by pencil.

The point I made in my statement before this Committee, and in other public statements, was that the PPBS that we are talking about, and the use of computers, really have very little to do with each other. Computers certainly don't play any essential role. But if it were not for computers, we would have to have a few thousand more clerks.

Senator JACKSON. On the lighter side, I want to refer to a news story that appeared in the *New York Times*.

As an enthusiastic outdoor sportsman, you undoubtedly followed the recent American Cup challenge race between the Intrepid and Dame Pattie.

This news story appeared in the *New York Times* on September 19, commenting on Australia's reliance on a computer in designing Dame Pattie. The story reads as follows:

The skipper of Australia's ill-fated America's Cup challenger refused tonight to blame a narrow-minded computer for Dame Pattie's failure.

The computer, a British KD-F9, digested 50 million calculations based on special data on Newport weather conditions in the month of September. Its conclusion: the average wind off Newport in September is 11 knots. Dame Pattie, apparently designed around that statistic, was crushed by Intrepid in heavier breezes during the series that ended here today in a 4-0 sweep for the defender.

"Statistics did prove that the average wind off Newport in September is 11 knots," Jock Sturrock said at the post-race news conference tonight. "After seeing that, Warwick Hood (Dame Pattie's designer) and I thought a light-air boat would be best."

Some observers here thought that designing a boat around a statistic, without leaving latitude for a range of wind and sea conditions, was an over-simplification. The Aussie plea going into the series was, "Give us light air and we'll show you Dame Pattie can go."

By the final race, the kind of light air wanted had dropped to the range of five or six knots. In anything over 12 knots or so, Intrepid walked away from her rival as if the challenger had buckets tied to her keel.

Dr. ENTHOVEN. Mr. Chairman, have you ever heard the story about the man who drowned in a river with an average depth of one foot?

One thing you have to say for computers is that they enable you to do a larger number of calculations, and, therefore, to consider systematically the full range of uncertainty. If that analysis had been done in my office, I would have seen to it that they considered systematically the full range of probable weather conditions, and not just the average. What you've just described is not a failure of analysis, you've just described a poor analysis. Their mistake was like the one made by the man who thought he was going to be comfortable because he was at a comfortable average temperature with one foot on the stove and the other foot in the refrigerator.

Senator JACKSON. The case of Dame Pattie suggests the really important point about the use of the computer. What counts is what is put into it. The value of what comes out of a computer depends upon the soundness of what goes into it.

And that is not the final answer either. You still have to use some judgment.

Senator HARRIS?

Senator HARRIS. Mr. Chairman, I am sorry that my presence was required this morning at the Senate Finance Committee, where, as you

know, we heard from four members of the Cabinet on the import quota problem. The committee virtually had the unusual opportunity of sitting in on a Cabinet meeting. I was not able to be here earlier. I assure you that I will study the record of this morning's hearings.

Rather than prolong the meeting, the hour being rather late, and the Senate being in session, what I might do, Mr. Chairman, with your approval, would be to submit some questions in writing, to which our witness might respond in writing for the record.

Dr. ENTHOVEN. I would be very happy to do that.

Senator JACKSON. That will be fine.

Senator JACKSON. Dr. Tufts.

Dr. TUFTS. I will be glad to handle my questions in the same way.

Senator JACKSON. I suggest you ask a couple. We will recess in a few minutes.

ROLE OF COST IN DECIDING REQUIREMENTS

Dr. TUFTS. If I may, then, I would like to ask two questions.

Secretary McNamara told the Congress this year, "The force requirements are established not in relation to cost . . . Our requirements for Defense are established without any regard to cost. They are established entirely on the basis of our political commitments and the threat, and only then does cost play a role in choosing among alternative ways to meet the requirements."

Is there not a contradiction here with your argument that actually cost does play a role in deciding requirements that a President will settle for?

Dr. ENTHOVEN. No, there is no contradiction. Mr. McNamara is not saying that he does not care about the cost. He is saying that in deciding what we need, he will do so without reference to any pre-determined financial limit, and that if he believes our security requires certain forces, he will recommend buying them regardless of the cost.

Let me give you an example. We believe that we have to have an invulnerable strategic retaliatory force that is capable of destroying the Soviet Union in a second strike. Whether that costs \$2 billion or \$20 billion a year, we believe we have to have that. The choice of particular systems to achieve that objective, of course, depends on what we refer to as "cost-effectiveness," that is, we seek the combination of systems that meets the objective at the least cost.

Also, of course, every objective is itself a means to some still broader end. If the costs got very high to meet some objective we had set upon, we might well reconsider the objective in terms of what it was meant to achieve, and see if there is not some other way of meeting the larger objective.

It is a complicated point. There are still many people who believe that we operate on the basis of arbitrary, pre-determined financial limits, and that is definitely not the case.

Dr. TURRS. Nevertheless, there must be something of the sort that we used to call a budget ceiling in the old days in the sense that if what we figure out to be our requirements are going to cost more than the President feels able to allocate for many purposes, then he will have to decide which requirements he is going to meet, and which requirements he is going to sacrifice.

Dr. ENTHOVEN. Right. This is the point. Then he is going to have to reconsider the foreign policy objectives on the basis of which those requirements were derived. But we don't want to have a foreign policy that is not matched by the military posture required to carry it out. If the President and the Congress find the cost too high, they may well have to reconsider the foreign policy objectives.

Secretary McNamara's point is that that is the way we ought to do it. We ought to have our foreign policy objectives and our Defense posture in balance. Having balanced them, if we believe that the Defense budget is too high then we ought to reconsider the whole policy. But we should not have a foreign policy that is not supported appropriately by our military forces.

PROBLEMS IN EXTENDING PPB TO OTHER AREAS OF GOVERNMENT

Dr. TUFTS. My second question is based on the fact that our subcommittee is not only considering the application of PPB in Defense, but also the struggles and experiments with PPB in other national security departments and agencies.

I would like to ask, on the basis of your long experience with PPBS in Defense, what problems do you anticipate in extending this approach to other areas of Government, both domestic and foreign, and do you have any cautionary suggestions to offer to your colleagues in the rest of the Government who will be embarked on this enterprise?

Dr. ENTHOVEN. I think that the potential benefits from extending PPBS to the rest of the Government are great, but their realization will not be easy.

I believe that you must have a good research program on which to base PPBS. One of the reasons that we were able to move as quickly and as effectively as we were in Defense is that there had been a continuing, broadly-based research program going on for 10 or 12 years before we tried to bring PPBS into the Defense Department.

I think in most other areas of the Government, such as foreign policy, you will find that there is much less that can be done with calculation. You can do a lot of useful calculations when you are studying the anti-missile missile. You cannot do very much with calculations when you are talking about what should be the mix of different United States Government programs in some foreign country.

Nevertheless, the basic, elementary program information that is made available to the ambassador by Consolidated Country Programming is likely to be useful in many cases. I do believe that the PPB system could generate useful information on the costs of the various programs.

Let me give you an example of what I mean. A few years ago, there was a big disagreement about the number of Navy carrier planes we ought to have to go with our aircraft carriers. The Navy's theory was based on the assumption that we must fill the carrier decks at all times. This was at a time when we were bringing in new Forrestal class carriers that were much larger than their predecessors. Some of us felt that the size of the carrier deck was not a very good basis on which to decide how much tactical air power the United States ought to have.

We haven't yet developed a set of calculations that tell us what is the right relationship between aircraft carriers and numbers of planes. But I found that the Navy people with whom I was discussing this problem and I were proceeding on very different assumptions about where the money was going.

In fact, many people thought that most of the cost of carrier task forces was in the carrier and the surrounding ships. But one Naval officer did a study that we called the "cost map of the Navy," which broke out in detail where all the money was going. It turned out that there had been an optical illusion, and that the majority of the money in the attack carrier force was going into the airplanes, even though the airplanes were much smaller than the ships. That was because airplanes are expensive and they have to be replaced often.

We reviewed this information and found it interesting, and not fully in accord with what we had expected beforehand. It was a major factor in causing many people's judgment on the question to shift, and in greatly narrowing the range of disagreement.

Before, some people had been thinking it was like this: you pay a lot of money to get a soldier out to Korea, and when you get him there, it makes sense to spend a little more money to put some bullets in his rifle.

It turned out it was not that way at all. In the attack carrier force, most of the money is in the "bullets," or in the airplanes, and not in the ships. Once we all realized that, we agreed that the size of the carrier deck was not a good basis for deciding how much tactical airpower the United States needs.

I cite that as an example in which cost information, though not decisive by itself, can provide new and very interesting insights.

I think that laying out for the decision makers where the money is going in terms of output-oriented programs, and by country, may in many cases lead them to a better understanding of the problem than they had before.

I don't expect any spectacular breakthroughs. The studies that we did in the early days of PPBS in the Pentagon were terribly primitive by today's standards. I expect other areas of the Government will have to go through a phase of very primitive, very unsophisticated studies that you will want to treat with considerable caution.

In 1963, I gave a speech to the Naval War College in which I said that my own view then was that the art of systems analysis was at about the same stage that medicine had reached in the latter part of the 19th century. That is, it had just reached a point where, on the average, it was doing as much good as harm. I added, I did not think that that would be a good reason for stopping the development of systems analysis, any more than it would have been a good reason in the 19th century for not going on with the development of medicine.

But it is reason for treating the results that you get with caution and good judgment.

The fact that it is a "cost-effectiveness" study does not make it right, especially if it has not been interrogated by someone with an opposing point of view.

DOES COST-BENEFIT ANALYSIS SHORT-CHANGE BENEFITS?

Dr. TUFTS. I guess what underlies my concern is that costs are so precise.

Dr. ENTHOVEN. I wish they were.

Dr. TUFTS. Well, relatively speaking, they are so precise, and people attach importance to a costing figure, partly because it is a number.

I think, in comparison, effectiveness is much more difficult to measure, both the negative effectiveness and the positive effectiveness, or what I prefer to call benefits, negative and positive benefits. They are much more difficult to reach precise estimates of.

Dr. ENTHOVEN. That is true; benefits are harder to measure.

Dr. TUFTS. I am always troubled, therefore, by the possibility that cost-effectiveness or cost-benefit is somehow biased on the cost side, rather than on the benefit side.

Dr. ENTHOVEN. All sorts of mistakes can be made under the guise of "cost-effectiveness analysis" just as they can under the guise of judgment or experience. There may be cases in which some people over-emphasize the cost, and other cases in which they over-emphasize the potential gains in effectiveness.

That is a problem that you have to watch out for, but I do think it is better to make the analysis explicit so that you have a way of checking on it.

You see, I think that there have been many cases in which there was an over-emphasis on cost, without a "cost-effectiveness" analysis, simply because someone was trying to put together a budget, and thought only about the cost.

My defense of systems analysis and cost-benefit analysis in these circumstances is that the person doing it has to make the whole thing explicit. He has to lay it out in such a way that other people, including critics, can see what is done. Then other people can decide whether or not they think cost has been over-emphasized. Whereas if I hold all the cards close to my chest, and say, "I am not going to give you an analysis; it is just my judgment, or my opinion that it ought to be this way," then you have no way of testing whether I over-emphasize the costs or not.

But if I am required to lay the whole thing out and say, "These are the benefits that I claim, and this is my evidence for it, these are my calculations, these are my cost estimates," then other people can judge it for themselves. With an open, explicit analysis, we can all review the results with due process. I think that is the best way to reach decisions in government.

Senator JACKSON. Senator Harris?

Senator HARRIS. No questions, Mr. Chairman.

Senator JACKSON. We certainly can all agree on one thing, Dr. Enthoven, and that is that this is a very important subject.

I think it is quite clear that systems analysis, cost-benefit analysis, and planning-programming-budgeting are now conspicuous parts of our governmental operations. I would hope that through these hearings we can come up with a better understanding and appreciation of the capabilities and limitations of these techniques. That is the objective of the Chairman, and, I am sure, of the members of the committee.

It should be said, I think, that PPB in Defense has meant a greater centralization of decision-making and control in the Office of the Secretary of Defense. The "due process" you mention proceeds under conditions where OSD can, if it wants, ignore or simply "not be convinced" by conflicting views of contingencies, costs and benefits, and so forth. This is an important aspect of the matter which the subcommittee will wish to explore further as these hearings proceed.

I want to thank you, and express the appreciation of the committee, for your forthright answers to the questions we have put to you, and for the opportunity to have the benefit of your comments and judgment.

Dr. ENTHOVEN. Thank you very much, Mr. Chairman.

I very much appreciate the opportunity to appear and discuss these questions.

Senator JACKSON. Thank you very much.

(The additional questions and answers referred to on p. 305 follow:)

MEMORANDUM OF QUESTIONS FROM SENATOR HARRIS AND RESPONSES BY
DR. ALAIN ENTHOVEN

Question 1:

On another occasion you have said: "Systems analysis is a reasoned approach to problems of decision, accurately described as 'quantitative common sense.'"

You have also said: "Systems analysis is an application of scientific method, using that term in its broadest sense."

Does systems analysis in your view resemble more closely *the social sciences or the natural sciences?*

Response:

First, let me present the whole passage in which I originally made the second statement. Standing alone, it doesn't explain the point I was making. It comes from a speech I gave at the Naval War College in June 1963, although I have occasionally made the same statement since. The passage follows:

The problem of choosing strategies and weapon systems is a unique problem requiring a method of its own. It is obviously not Physics or Engineering or Mathematics or Psychology or Diplomacy or Economics, nor is it entirely a problem in military operations though it involves elements of all of the above. Because it involves a synthesis of the above-mentioned disciplines and others, it requires the cooperation of experts in all of these professions and many others. It is a not infrequent error, made by civilians and military alike, to identify defense planning uniquely with one of the above professions or disciplines.

Beyond its uniqueness and eclecticism, I would like to say that the art of weapon systems analysis, like the art of medicine, should be based on scientific method, using that term in its broadest sense. But one hesitates to say "scientific" for several reasons. First, there are many follies that have been advertised as scientific. I can appreciate that it would be tiresome to say the least for an experienced military man to be told that we need a "scientific" approach to war or to amphibious forces. Warfare is, after all, more an art than a science, combining such critical but intangible factors as training, morale, and leadership. Second, one risks suggesting that scientists are therefore the leading experts. One sees nuclear physicists advertised as experts on thermonuclear war despite the fact that they have never done any empirical study of war and know nothing about it, and this must also be tiresome to a military man. But the point is not the authority of science or of scientists. Rather, it is the *method* of science.

What are the relevant characteristics of scientific method as applied to the problem of choosing strategies and selecting weapon systems? There are several.

First, the method of science is an open, explicit, verifiable self-correcting process. It combines logic and empirical evidence. The method and tradition of science require that scientific results be openly arrived at in such a way that any other scientist can retrace the same steps and get the same result. Applying this to weapon systems and to strategy would require that all calculations, assumptions, empirical data, and judgments be described in the analysis in such a way that they can be subjected to checking, testing, criticism, debate, discussion, and possible refutation. Of course, neither science nor systems analysis is infallible. Chemists used to believe in the phlogiston theory of combustion. Some biologists still claim to believe in the inheritance of acquired traits. And I have seen many systems analyses containing equally questionable conclusions. But infallibility is not being claimed; it would be worse than unscientific to do so. However, scientific method does have a self-correcting character that helps to guard science from persistence in error in the long run.

Second, scientific method is objective. Although personalities doubtless play an important part in the life of the Physics profession, the science itself does not depend upon personalities or vested interests. The truth of a scientific proposition is established by logical and empirical methods common to the profession as a whole. The young and inexperienced scientist can challenge the results of an older and more experienced one, or an obscure scientist can challenge the findings of a Nobel Prize winner, and the profession will evaluate the results on the basis of methods quite independent of the authority of the contenders, and will establish what is the correct conclusion. In other words, the result is established on the objective quality of the Physics and not on the reputations of the persons involved. Of course, doubtless, on such occasions, some will scoff at the challenger, and the odds favor the Nobel Prize winners. But the Physics profession is not likely to go about harboring incorrect hypotheses for very long because of the authority of the originators.

Of course, let me emphasize that I say this with respect to the problem of selection of weapon systems and strategies and not with respect to military operational command which is a very different matter. In the latter case we have no sensible alternative to reliance on experience and reputation.

Third, in scientific method in the broadest sense, each hypothesis is tested and verified by methods appropriate to the hypothesis in question. Some are tested and verified logically, some experimentally, some historically, *et cetera*. Some sciences, of course, can reproduce experiments cheaply and they tend to emphasize experiment. This is notably the case with the Physical Sciences. In others, particularly some branches of Medicine and the Social Sciences, one cannot experiment readily, if at all, and the detailed analysis of available historical data is most appropriate. In this respect, they resemble Military Science very closely. In choosing weapon systems some experimentation is possible but a great deal of analysis is also required. In fact, in the development of weapon systems analysis, one is more handicapped than in most of the sciences, for fully realistic tests come only at infrequent intervals in war, while the development of new weapon systems also takes place in peacetime. But this argues for better analysis and more heavy reliance on analysis where fully relevant experience is not generally available.

Fourth, quantitative aspects are treated quantitatively. This is not to say that all matters can be reduced to numbers, or even that most can be, or that the most important aspects can be. It is merely to say that the appropriate method for dealing with some aspects of problems of choice of weapon systems and strategies requires numbers. Non-quantitative judgment is simply not enough.

What is at issue here really is not numbers or computers versus words or judgment. The real issue is one of clarity of understanding and expression. Take, for example, the statement "Nuclear power for surface ships offers a major increase in effectiveness." Precisely what does that mean? Does it mean 10 per cent better or 100 per cent better? When that sort of question is asked a frequent answer is, "It can't be expressed in numbers." But it has to be expressed with the help of numbers. Budgets are expressed in dollars, and nuclear power costs more than conventional power. If nuclear power costs, say 33 per cent more for some ship type, all factors considered, then, no matter what the budget level, the Navy and the Secretary of Defense have to face the choice of whether to put the nation's resources into four conventional or three nuclear ships, or for a larger budget, eight conventional or six nuclear ships, and therefore whether by "major increase" is meant more than 33 per cent, about 33 per

cent, or less than 33 per cent. Because the Secretary of Defense has to make the decision in these terms, the statement "major increase" is not particularly helpful. It must be replaced by a quantitative analysis of the performance of various missions, leading to a conclusion such as, "Nuclear power for surface ships offers something between X and Y per cent more effectiveness per ship. Therefore, \$1 billion spent on nuclear powered ships will provide a force somewhere between A and B per cent more or less effective than the same dollars spent on conventionally powered ships."

Numbers are a part of our language. Where a quantitative matter is being discussed, the greatest clarity of thought is achieved by using numbers instead of by avoiding them, *even when uncertainties are present*. This is not to rule out judgment and insight. Rather, it is to say, that judgments and insights need, like everything else, to be expressed with clarity if they are to be useful.

Now let me turn to the question, "does Systems Analysis in your view resemble more closely the social sciences or the natural sciences?"

I would like to answer with "Render unto Caesar the things that are Caesar's . . ." because Systems Analysis must draw on both the social sciences and the natural sciences. Because I believe that neither can be fruitful without the other, I am reluctant to say anything that would suggest that choosing strategies and weapon systems is more the province of one than the other.

The question reminds me of a debate between a biologist, a physicist, and an economist, over whose science was the more ancient. The biologist said, "Biology is the oldest; it started when God created Adam and Eve in the Garden of Eden."

"No, no," said the physicist, "before he did that, God had to create the Earth out of chaos, and that was Physics."

"Ah, yes," said the economist, "that's just my point. He started with chaos, and that's where Economics comes in."

I believe that Systems Analysis strongly resembles some branches of the social sciences in that it is concerned with questions of human choice, value, and decision, in the face of limited resources and great uncertainty. I also believe that the analyses should be based on the best technical information we can get from the natural sciences.

Question 2:

We would all agree of course that judgments of military and civilian officers in government are often heavily biased with service or departmental prejudice. But prejudice is not confined to the dull or the unsophisticated; it also limits the thinking of the most gifted and the most highly trained.

I would welcome your reflections on the difficulties of observing *true scientific discipline*, and especially in a job like yours as a member of what you people call "the team!"

To spark your reply, let me quote a brief comment by Bernard Brodie when he was Senior Staff Member at RAND and engaged in strategy studies and systems analysis:

Those of us who do this work are beset by all kinds of limitations, including limitations in talent and in available knowledge. Where the object is to predict the future, for the sake of appropriate action, we simply cannot wait until all the relevant facts are in. Besides, we can make progress only as we cut off and treat in isolation a small portion of the total universe of data and of problems that confront us, and every research project is to that extent "out of context." In addition, we are dealing always with large admixtures of pure chance. These are sometimes difficult to take into full account without seeming to stultify our results, and that human beings are naturally loath to do. The

same is true of the large range of variables which deal with enemy intentions and capabilities. Finally, we are immersed in bias, our own and that of our clients or readers. With our audience, in spite of our strong efforts to be objective, we cannot avoid being influenced by what we know it likes to hear. Feelings of loyalty and friendship are involved, as well as a normal liking for applause.

Response:

I agree with Bernard Brodie's statement. Let me make two comments on it and on your question.

First, the difficulties Professor Brodie describes are in the problems and in the fact that the people working on the problems are human. In other words, Professor Brodie is commenting on the difficulties inherent in problems of strategy and on the human condition; he is not commenting on Systems Analysis as such. Systems Analysis is certainly not exempt from the limitations on all human thought and knowledge.

Second, I agree that: ". . . prejudice is not confined to the dull or the unsophisticated; it also limits the thinking of the most gifted and the most highly trained." That is why I believe so strongly in open, explicit analysis, rather than on the method of authority. That is why I believe so strongly in interrogation and cross-questioning. That is why I have said that Systems Analysis is not a substitute for debate, but rather a set of logical ground rules for a constructive and fruitful debate. And that is why I believe an analysis should not be accepted by a responsible decision maker until it has been subjected to a critical scrutiny by other analysts with opposing views. In fact, one of the main reasons for the establishment of my office, within the Office of the Secretary of Defense, was to make available to the Secretary of Defense independent critiques of the analyses submitted to him.

Question 3:

Defense decision-making in the late 1960s and the 1970s is obviously increasing in its complexity, and this carries major implications for the systems analyst.

James R. Schlesinger of RAND has written a piece on "The Changing Environment for Systems Analysis" in which he makes the point that systems analysis has been overly dominated by those relatively simple strategies appropriate for the early nuclear period—which permitted quantitatively precise evaluation of mutual destructiveness in a showdown clash, actual or hypothetical, between the two superpowers.

To what extent do you think this is the case, and how is systems analysis itself as a technique changing?

Response:

I am not acquainted with the article.

Since Mr. Schlesinger's systems analysis experience is limited to The RAND Corporation, I assume that he is referring to systems analysis at RAND when he says that it has been overly dominated by those relatively simple strategies appropriate for the early nuclear period. At least, he should not be referring to the analyses used at the top levels of the Department of Defense because he has not worked on these analyses, and enough of them would not be available to him to permit him to make such a judgment.

I believe that the studies we did in the early 1960s were very primitive by today's standards. As I described in my testimony, the state of the analytical art in 1961 limited us to relatively simple calculations of the number of weapons that would be required to inflict predetermined levels of damage against a projected target list for estimating our strategic offensive force requirements. Since that time, we have gone on to integrate our analysis of strategic offensive and defensive forces, to consider systematically enemy reactions to each of the choices we might make, and to examine how we can make choices that will influence him to go in directions less dangerous for us. For example, one of the main reasons that we maintain and constantly improve our strategic bomber force is to make the USSR divide its budget between anti-missile defense and anti-bomber defense. We would prefer that the Soviets spent their money on anti-aircraft defenses rather than on more offensive weapons. We now examine a broad range of alternative, complex strategies. Our analyses are, today, much richer in the realistic representation of complex reality than they were a few years ago. I fully expect—indeed hope—that today's analyses will seem very primitive by comparison with better analyses done ten years from now.

Question 4:

A. You have emphasized on other occasions that one condition for a successful development and functioning of a Systems Analysis group within a policy-making organization is that it be fed with a broadly based interdisciplinary research program. Would you discuss some of the practical implications of the research program in Defense, and of research programs for foreign affairs or other major social problems outside of Defense?

B. What sort of luck do you have in contracting out issues and problems to *outside research institutes*? Isn't there a great variation in the quality of the work? Do you have to be very cautious about particular reports and analyses?

Response:

A. Every area of public policy can benefit greatly from the existence of an informed, independent professional opinion. Our system of jurisprudence benefits from the independent Legal Profession. Every court decision is carefully scrutinized and debated by many lawyers. Flaws in reasoning get exposed and eventually corrected. Our national economic policies benefit from the existence of the Economics Profession. I believe that an informed, independent professional opinion is desirable in military and other national security affairs also. But, the development of such an informed, independent professional opinion is inhibited by two factors. First, most of the factual information on which Defense policy is based has to be classified for reasons of military security. Second, important national security problems, for the most part, are beyond the capability of individual scholars exercising individual disciplines. Significant original contributions to thought about national security affairs generally require the combined work of people from different fields, each contributing his own specialized knowledge, but doing so in a way that is relevant to the larger problem. The RAND Corporation, for example, was organized to deal

with these two problems. That is why, in my opinion, the Department of Defense should support organizations like RAND.

Significant original contributions to the solution of many of the serious problems confronting our society today, outside of the realm of military affairs, are also beyond the reach of individual scholars exercising individual disciplines. For example, how can we effectively integrate the full range of our Government programs to help traditional underdeveloped societies make the transition to sustained economic growth and government responsive to the wishes of their citizens? Or, how can we break the cycle of poverty in our cities? Each of these problems is terribly complex, and each needs to be looked at as a complete system. Neither of them can be solved or even greatly ameliorated by solving one part of the problem alone, such as income, or health, or security.

Most academic research institutes organized to study these problems are, unfortunately, little more than holding companies for individual scholars exercising individual disciplines. I think we ought to re-examine our programs for supporting policy research to see how they can more effectively foster the development of genuine interdisciplinary research oriented towards the solution of these problems.

B. There is a great variation in the quality of the work produced by the outside research institutes that work for the Department of Defense, ranging from brilliant contributions of far reaching importance, to solid workmanlike problem solving, to worthless junk. Of course, a good research institute can pay for itself many times over with one good idea.

Yes, we do have to be very cautious about particular reports and analyses. I never accept their conclusions as authoritative. Even good as RAND is, the fact that a RAND report reaches a particular conclusion carries very little weight with me. I want to see the logic and the evidence and the judgments that led to that conclusion. Such a report may make a very valuable contribution to thought by developing an analytical framework that helps us to understand the problem. But, the Secretary of Defense may reach a policy conclusion that is different from the one reached by the author of the report because he considers different assumptions more probable or different judgments more valid.

(Whereupon, at 12:45 p.m., the subcommittee recessed, to reconvene at the call of the Chair.)



PLANNING—PROGRAMMING—BUDGETING

HEARINGS
BEFORE THE
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS
OF THE
COMMITTEE ON
GOVERNMENT OPERATIONS
UNITED STATES SENATE
NINETIETH CONGRESS
SECOND SESSION

PART 3

WITH
ELMER B. STAATS, COMPTROLLER GENERAL OF THE
UNITED STATES

MARCH 26, 1968



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PLANNING—PROGRAMMING—BUDGETING

TUESDAY, MARCH 26, 1968

U.S. SENATE,
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

[This hearing was held in executive session and subsequently ordered made public by the chairman of the subcommittee.]

The subcommittee met at 10 a.m., pursuant to notice, in room 3112, New Senate Office Building, Senator Henry M. Jackson (chairman of the subcommittee) presiding.

Present: Senators Jackson, Mundt, and Baker.

Subcommittee staff members present: Dorothy Fosdick, staff director; Robert W. Tufts, chief consultant; Judith J. Spahr, chief clerk; Richard E. Brown, research assistant; and William O. Farber, minority consultant.

GAO personnel present: Frank H. Weitzel, Assistant Comptroller General; E. H. Morse, Director, Office of Policy and Special Studies; Keith Marvin, Associate Director, Office of Policy and Special Studies; Gregory J. Ahart, Deputy Director, Civil Division; Oye V. Stovall, Director, International Division; Daniel Borth, Associate Director, Defense Division; L. Fred Thompson, Legislative Attorney, Office of Legislative Liaison; Roland Sawyer, Information Officer; and William F. McCandless, Consultant.

OPENING STATEMENT OF THE CHAIRMAN

Senator JACKSON. The subcommittee will come to order.

Today we continue our hearings in the subcommittee's review of the benefits and costs of the planning-programming-budgeting system (PPBS), introduced into the Department of Defense starting in 1961, and extended to most of the other federal departments and agencies by President Johnson in August 1965.

Consistent with its jurisdiction, the subcommittee's review is focused on the operation of the PPB system in the national security area. The spirit of the inquiry is nonpartisan and professional.

With the consent of the members, I will place at this point in the record a copy of Senate Resolution 212, authorizing the funds for our subcommittee, together with the report thereon.

(The documents referred to follow:)

[S. Res. 212, 90th Cong., 2d sess.]

RESOLUTION

Resolved, That in holding hearings, reporting such hearings, and making investigations as authorized by section 134 of the Legislative Reorganization Act of 1946, and in accordance with its jurisdiction under rule XXV of the Standing Rules of the Senate, the Committee on Government Operations, or any subcommittee thereof, is authorized, from February 1, 1968, through January 31, 1969, to make studies as to the efficiency and economy of operations of all branches and functions of the Government with particular reference to:

(1) the effectiveness of present national security methods, staffing, and processes as tested against the requirements imposed by the rapidly mounting complexity of national security problems;

(2) the capacity of present national security staffing, methods, and processes to make full use of the Nation's resources of knowledge, talents, and skills;

(3) the adequacy of present intergovernmental relationships between the United States and international organizations of which the United States is a member; and

(4) legislative and other proposals or means to improve these methods, processes, and relationships.

SEC. 2. For the purposes of this resolution, the committee, from February 1, 1968, to January 31, 1969, inclusive, is authorized—

(1) to make such expenditures as it deems advisable;

(2) to employ, upon a temporary basis, and fix the compensation of technical, clerical, and other assistants and consultants: *Provided*, That the minority of the committee is authorized at its discretion to select one employee for appointment, and the person so selected shall be appointed and his compensation shall be so fixed that his gross rate shall not be less by more than \$2,300 than the highest gross rate paid to any other employee; and

(3) with the prior consent of the head of the department or agency concerned, and the Committee on Rules and Administration, to utilize on a reimbursable basis the services, information, facilities, and personnel of any department or agency of the Government.

SEC. 3. Expenses of the committee under this resolution, which shall not exceed \$90,000, shall be paid from the contingent fund of the Senate upon vouchers approved by the chairman of the committee.

[S. Rept. 962, 90th Cong., 2d sess.]

STUDY OF CERTAIN ASPECTS OF NATIONAL SECURITY AND INTERNATIONAL OPERATIONS

The Committee on Rules and Administration, to which was referred the resolution (S. Res. 212) authorizing an investigation of certain aspects of national security and international operations, having considered the same, reports favorably thereon without amendment and recommends that the resolution be agreed to.

Senate Resolution 212 would authorize the Committee on Government Operations, or any duly authorized subcommittee thereof, to expend not to exceed \$90,000 from February 1, 1968, through January 31, 1969, to make studies as to the efficiency and economy of operations of all branches and functions of the Government with particular reference to—

(1) The effectiveness of present national security methods, staffing, and processes as tested against the requirements imposed by the rapidly mounting complexity of national security problems;

(2) The capacity of present national security staffing, methods, and processes to make full use of the Nation's resources of knowledge, talents, and skills;

(3) The adequacy of present intergovernmental relationships between the United States and international organizations of which the United States is a member; and

(4) Legislative and other proposals or means to improve these methods, processes, and relationships.

Moneys authorized by the Senate for the same purpose during the 88th and 89th Congresses and the 90th Congress, first session, and expenditures by the committee therefrom through December 31, 1967, are as follows:

	<i>Authorized</i>	<i>Expended</i>
88th Cong.:		
1st sess.-----	\$92,250.00	\$53,537.81
2d sess.-----	90,000.00	56,211.98
Total -----	<u>182,250.00</u>	<u>109,749.79</u>
89th Cong.:		
1st sess.-----	90,000.00	64,724.21
2d sess.-----	90,000.00	63,443.97
Total -----	<u>180,000.00</u>	<u>128,168.18</u>
90th Cong.:		
1st sess.-----	90,000.00	58,236.38
2d sess.-----		
Total -----	<u>90,000.00</u>	<u>58,236.38</u>

Additional information relative to the proposed inquiry is contained in a letter to Senator B. Everett Jordan, chairman of the Committee on Rules and Administration, from Senator Henry M. Jackson, chairman of the Subcommittee on National Security and International Operations of the Committee on Government Operations, which letter (with accompanying budget) is as follows:

U.S. SENATE,
 COMMITTEE ON GOVERNMENT OPERATIONS,
 SUBCOMMITTEE ON NATIONAL SECURITY
 AND INTERNATIONAL OPERATIONS,
January 22, 1968.

Hon. B. EVERETT JORDAN,
*Chairman, Committee on Rules and Administration,
 U.S. Senate, Washington, D.C.*

MY DEAR MR. CHAIRMAN: Reference is made to Senate Resolution 212, 90th Congress, second session, which was introduced in the Senate on January 22, 1968, requesting funds for studies as to the effectiveness of present national security methods, staffing, and processes, and the adequacy of inter-governmental relationships between this country and certain international organizations. The requested funds would cover the period from February 1, 1968, through January 31, 1969. Prior to submitting this resolution to the Senate, it was approved unanimously by the Committee on Government Operations.

Attached hereto is an estimated budget for the period. It is estimated under this budget that it will require \$90,000 to carry on the inquiry during the present year. This represents no increase in estimated spending and is the identical amount authorized for our study during the last year.

As you are aware, our subcommittee is studying national security operations in Washington and abroad and is making findings and suggestions for improvement as appropriate.

In the 90th Congress, first session, the subcommittee continued its study of the relations between the U.S. Government and the Atlantic Alliance, issuing both background studies and a staff report on "The Atlantic Alliance: Unfinished Business." The subcommittee also initiated the first major congressional inquiry into the application of the planning-programming-budgeting system (PPBS) in the national security area. Initial hearings on PPB were held in August, September, and October. Released in two parts, these hearings include testimony from Charles L. Schultze, Director, Bureau of the Budget; and Dr. Alain C. Enthoven, Assistant Secretary of Defense (Systems Analysis). The staff prepared a series of background studies relating to PPB and a report on the basic issues on which the subcommittee is taking testimony.

During the next year, the Subcommittee is planning to continue auditing the progress and performance of the executive branch in improving areas of national security operations. The subcommittee plans to proceed with its inquiry into the application of planning, program budgeting, systems analysis and cost-effectiveness study in defense and foreign affairs. The subcommittee's purpose is to encourage, to the extent that it may be possible, a balanced view of the value of these tools and management techniques; and we will issue findings and recommendations as appropriate.

Of the \$90,000 authorized for the subcommittee for the 12 months from February 1, 1967, to January 31, 1968, we expect to be able to return approximately \$23,000 to the Senate contingent fund. This year we were able to obtain the assistance of key consultants, including our chief consultant, on a part-time basis which made possible a considerable saving in salaries.

As you know, our work is being conducted on a professional and nonpartisan basis.

The study is being made by the Government Operations Committee in accordance with its jurisdiction under rule XXV of the Standing Rules of the Senate, providing that the committee shall have the duty of—

* * * * *

B. Studying the operation of Government activities at all levels with a view to determining its economy and efficiency;

C. Evaluating the effects of laws enacted to reorganize the legislative and executive branches of the Government;

D. Studying the intergovernmental relationships—between the United States and international organizations of which the United States is a member.

I shall be available to give the committee any further information desired.

The following information is provided in connection with your annual review of office space assigned to committees and subcommittees: The Subcommittee on National Security and International Operations has one room (room 135) which provides working accommodations for three staff members, and for the subcommittee's several consultants. In addition, the subcommittee has one small adjacent utility room (room 135-A).

Thanking you for your cooperation and with kind regards, I am

Sincerely yours,

HENRY M. JACKSON,

Chairman, Subcommittee on National Security and International Operations.

PROPOSED BUDGET

Position	Number	Annual salary	Monthly salary	Total for period of budget
STAFF				
Legal and investigative:				
Staff director.....	1	\$23,312	\$1,942.66	\$23,312
(Consultants, including the chief consultant and consultant to the minority).....	4-6			35,500
Editorial and research: Research assistant.....	1	3,572	297.66	3,572
Administrative and clerical:				
Chief clerk.....	1	8,836	736.33	8,836
Intern.....	1	2,632	219.33	2,632
Total.....	8-10			73,852
ADMINISTRATIVE				
Contribution to employees health benefit programs (\$8.88 per month per employee).....				435
Contribution to civil service retirement fund (6½ percent of total salaries paid).....				2,700
Contribution to employees Federal employees group life insurance (27 cents per month per \$1,000 coverage).....				200
Reimbursable payments to agencies.....				2,000
Travel (inclusive of field investigations).....				3,500
Hearings (inclusive of reporters' fees).....				2,000
Witness fees, expenses.....				3,200
Stationery, office supplies.....				500
Communications (telephone, telegraph).....				900
Newspapers, magazines, documents.....				400
Contingent fund.....				313
Total.....				16,148
Grand total.....				90,000

Funds requested, Senate Resolution 212, \$90,000; funds approved by Committee on Rules and Administration, \$90,000.

Senator JACKSON. From previous hearings before this subcommittee and from other materials we have published since the start of this inquiry, it is evident that members of Congress have many questions about the possibilities and the limits of the PPB system and about its implications for the organization of the Executive Branch and the powers and responsibilities of Congress.

Our questions arise for several reasons. I might underline two reasons here:

One: Congress has been dealing with budgetary questions for a long, long time, and it is not altogether clear from the testimony we have heard that the planning-programming-budgeting system is seen by all its proponents in a full historical perspective. How does the PPB system relate to previous budgetary concepts and practice? In what respects does PPB involve a change of concepts? To what extent is it merely an application of new tools to familiar problems of analysis? I doubt that we can correctly evaluate the contributions PPB might usefully make unless we can see it in its proper relation to past experience.

Two: Some advocates of PPB express regret that the results of this budgetary approach must be subject to legislative review and decision, on the ground that such review introduces what they regard as elements of "politics" in what would otherwise be a "rational process" of decision-making. Others recognize that "politics" is not going to be removed from the decision-making process in a democratic society, and they believe that PPB may help Congress to perform its function and discharge its constitutional responsibilities by providing Congress with better information than we have previously had. Obviously, Congress is not going to abdicate its constitutional responsibilities. What, then, are the needs to which the PPB system must respond if it is to be helpful to Congress? Clearly this raises delicate and difficult questions of access to information. Congress cannot be expected merely to accept without question the results that are said to flow from the PPB system.

In the hope of making progress on these and other questions, it seemed most desirable to ask Mr. Elmer B. Staats, Comptroller General of the United States, to testify in our inquiry. Mr. Staats has served the government faithfully and well for nearly three decades—28 years to be exact. He has been Deputy Director of the Bureau of the Budget under four different Presidents spanning the years 1950–53 and 1958–1966. On February 11, 1966, he was named Comptroller General by President Johnson. In that important position, while appointed by the President, his ultimate responsibility is to the Congress and to the President.

With this long and unique record of experience in the Executive Branch and in service to the Congress, Mr. Staats is remarkably qualified to discuss PPBS in the historical perspective which has been so conspicuously absent in so many of the discussions on the subject, and in the context of our American system of accountable government.

We are grateful to you for joining us this morning, Mr. Staats, and you may proceed in your own way.

STATEMENT OF ELMER B. STAATS, COMPTROLLER GENERAL OF THE UNITED STATES

Mr. STAATS. Thank you very much, Mr. Chairman.

I would like to express our appreciation for being invited to appear in the very fruitful series of hearings that this subcommittee has had. We have been very much interested in reports which have been issued by the committee as a result of these hearings.

I have with me today Mr. Frank Weitzel, Assistant Comptroller General, whom you know well. But I want to identify two or three others in particular.

Mr. William McCandless, who retired from the Bureau of the Budget last year, is here. He started with the Bureau in 1935 and was an Assistant Director for a large number of years. Just prior to his retirement he was in charge of the budget estimates work of the Bureau, and he is now consultant to the Comptroller General.

Mr. Daniel Borth is also here this morning. He had experience in the Bureau of the Budget and later in the Department of Defense. Having left the Department of Defense and after a time in university life, he has now joined the GAO. He is in charge of GAO activities involving the financial management and accounting improvement work of the Department of Defense.

Mr. Keith Marvin has recently joined us from the Department of Defense. His experience is in both engineering and accounting. He is now heading the systems analysis staff in our Office of Policy and Special Studies.

We have others here with particular interest and background, but I wanted especially to identify these four people.

Mr. Chairman, I am pleased to appear before your subcommittee to express my thoughts on the very important subject of planning-programming-budgeting systems (PPB).

You have requested that I provide the subcommittee with my analysis of the issues raised by the application of PPB in the Executive Branch, and the implications this has for the Congressional role in establishing national policies and budgets.

You have already heard much concerning the intended purposes and the origin of PPB concepts. Nevertheless, I will spend a few minutes reviewing this, as I see it, to provide the basis for my statement on the subject.

I. ESSENTIAL ELEMENTS OF PPB

When the President initiated PPB with a memorandum in August 1965 to the heads of departments and agencies, he stated that the PPB approach was to be used for three essential purposes: (1) to define national goals and identify those considered most urgent; (2) to determine alternative ways of attaining these goals and the probable attainment costs; and, (3) to improve performance by attaining the best possible program returns for each dollar spent.

PPB is thus an ordered way of examining problems of choice—choice among specific objectives intended to serve higher goals and choice among alternative courses of action through which defined objectives can be achieved.

It is a systematic analysis of alternative objectives and of alternative means, which sets out as fully as practicable, for examination by decisionmakers, the expected cost and benefit implications of alternative courses of action.

The analysis is designed to project expected costs and benefits into the future. It should examine into all aspects of costs and benefits or detriments, including social, political, and economic as well as financial factors, and including the implications for State and local government and the private sector as well as for the Federal Government.

In other words, to the extent practicable, the analysis should inquire into and lay out for consideration by the decisionmaker, the probable implications of each alternative course of action in all its dimensions.

These requirements create an emphasis upon efficient analytical methods for estimating future costs and benefits. They also increase the need for adequate information to support analyses of feasible alternative objectives and programs for their accomplishment. Better information is needed concerning the specific needs of our society, and better information is needed concerning the costs, results, and efficiency of programs that are already in existence.

The nature of PPB also requires certain organizational and procedural definition, since, to be effective in the decisionmaking process, the alternatives must be presented to the central decisionmakers and must be relatable to current programs. This entails, in addition to analysis, a multiyear projection into future years that can be related to the categories contained in the budget. The organization of the process in the Executive Branch must be such that the top decisionmakers are offered an opportunity to participate in the evaluation of the alternatives rather than only an opportunity to pass judgment on whether a specific course of action formulated at lower levels should be undertaken.

As our Government has responded over the years to the demands of the increasingly complex problems of the Nation, it has become more and more difficult for top decisionmakers to visualize the full implications of alternative courses of action. Over a period of several years, various techniques have been developed in response to the need for improved information that can be used by decisionmakers to make judgments on such alternatives. We can expect, I believe, further experimentation and research to develop techniques, and, hopefully, more useful information.

As you are aware PPB has, in the minds of some, acquired the image of being something totally new in concept. This subcommittee in its "Initial Memorandum," issued last August, stated quite correctly that the PPB approach to evaluation of alternatives is old. It adds, however, that PPB *may* for the first time identify these techniques as a "system" and give them a special name. I find that even the name is not completely new. Professor Frederick C. Mosher, in his book "Program Budgeting," published in 1953, had a chapter entitled, "Plans, Programs, and Budgets" in which he cites the need of the military services for "systems of integrated planning, programming, budgeting and operation." His book had particular reference to the Department of the Army.

In summary, therefore, the planning-programming-budgeting system is an effort to establish on a Government-wide basis a common approach and procedure for:

1. Establishing longer range planning in terms of Federal objectives and goals as defined by the Congress or the President.
2. Finding a procedure for identifying the most advantageous programs to fulfill these objectives on the basis of an analysis of costs and benefits of available alternatives.
3. Translating programs into budgetary and legislative proposals and longer term projections.

Inasmuch as the end products have been principally budgetary recommendations, some would prefer the simpler, more easily understood term "program budgeting" as embracing all three elements. I favor the simpler term.

II. ANTECEDENTS OF PPB

You have heard from Dr. Enthoven and others of the history of developments in the Department of Defense leading up to the adoption by Secretary McNamara in 1961 of PPB for management of the military programs. A brief attachment to my statement lists some of the statements of the Secretary of Defense made during hearings before the Subcommittee on Department of Defense Appropriations of the House of Representatives, in support of the fiscal year 1963 budget. This attachment provides some additional insight into the differences between the budget submissions to the Congress before and after PPB. (See attachment 1, p. 333.) During the same period and up to the time PPB was initiated on a Government-wide basis by the President in August 1965, elsewhere in the Government there were developments that furthered the concepts now identified as PPB. Many of these developments, especially those in the central budgetary process, were applicable to all agencies of the Government, including Defense, but this department was often excused from compliance on representation by the Secretary of Defense of special problems of management with which he had to deal. Nevertheless, it is fair to say that there was doubtless some interaction between the two streams of development.

Some of the major antecedents to PPB other than those specifically identified with military programs are:

1. *Cost benefit analyses for water resources programs* were called for, as noted in your Initial Memorandum, as early as the Rivers and Harbors Act of 1902. The Flood Control Act of 1936 was quite explicit that flood control projects should be begun only when estimated benefits are in excess of costs. The Bureau of the Budget (BOB) began in 1943, as required by Executive Order 9384, to review all reports on water resources projects before they were transmitted to the Congress.

From such central reviews, guides for the evaluation of such projects began to take form and were formalized in BOB Circular No. A-47 in 1952. This Circular was replaced in May 1962, when the Ad Hoc Water Resources Council appointed by President Kennedy in 1961 recommended new guidelines, which were approved by the President and were printed as Senate Document 97. These guidelines were supplemented in 1964 to deal with recreation features of projects. Permanent provision was made for the

development of policy and guides for the evaluation of water resource projects, with the establishment by law of the Water Resources Council in 1965.

2. *Longer range projections of budget totals* for the purpose of developing policy guides for the preparation of agency budget requests and for the examination of these requests by BOB were begun about 1946. These began as very rough projections made internally by BOB staff on the basis of prior congressional actions and the programs and policies in the latest budget transmittal to the Congress and covered about 5 future years. They later were more closely related to agency longer range program plans and took into account new programs to meet emerging national needs.

In 1961 BOB made public a projection giving alternative dimensions of the Federal budget in the years 1965 and 1970, based on past trends in spending and on three varying assumptions—"high," "low," and "most likely"—as to the future trend in spending.

3. *A budget preview process* was begun by BOB in 1946 as a preliminary step in the preparation of the 1948 budget. Its primary purpose then was to develop and communicate to the major agencies general policy guidance for the preparation of their requests to be submitted in the fall. This purpose was served, beginning in 1947, by "ceiling" or "target" figures which were given to the major agencies to give them meaningful guidance as to the President's general budgetary objectives. As time went on, this preview became more and more a systematic procedure for program planning and evaluation.

The preview was marked in 1961 by the formal adoption of a two-stage process for the preparation of the 1963 budget, comprising a longer range forward look at the budget prospects in the spring and the usual preparation of the Budget in the fall. The Budget Director's letters setting forth this plan to the major agencies expressed the intention to make the spring budget preview period a time of useful joint examination of goals and objectives, and of major policy questions, rather than a time of negotiation of detailed budget figures.

The movement in this direction continued steadily. In 1964 agencies were first asked to submit program plans, as such, related to their financial plans, to indicate the relative priorities of programs, and to examine in depth certain program issues that had been identified as a result of joint discussions. By the spring of 1965, the preview for the 1967 budget had taken on essentially the elements that we now associate with PPB.

4. *Functional budget preparation* first appeared in the President's message transmitting the 1946 budget, and a new comprehensive classification, basically the same as in use today, was adopted in the 1948 budget. This set forth the President's proposals in major functional categories corresponding to the Government's broad missions that cut across agency lines. These categories were broken down into more specific subfunctions and related to the programs of individual agencies. Shortly before that time the same kind of classification had been used by BOB in its internal projections of the budget.

To facilitate the examination of the budget in this functional framework, BOB was reorganized on a broad program basis in 1951. Later this functional approach was furthered by special analyses that appeared in the budget documents. There were special analyses first on public-works programs and programs involving grants for the States and later on such programs as those for research and development, health, and education.

These special analyses had the advantage of being able to deal with programs which furthered overall or general national objectives as a secondary purpose, the programs' primary purpose being to serve some other and more specific Government function. Examples are the educational and health activities of the Department of Defense and the Veterans Administration, which appear under the veterans benefits and national defense functions in the function classification, but appear under education and under health, respectively, in the special analyses.

5. *Performance and cost-based budgeting*—Another important antecedent was the development of the concept of performance and cost-based budgets recommended by the first Hoover Commission in February 1949. The Budget Director announced in August 1949 that the Budget for the fiscal year 1951 would be presented on a performance basis. The instructions for the 1951 budget were issued in BOB Circular No. A-11 and required budget presentations and justifications to be built on the framework of programs and activities rather than on objects of expenditure (such as personnel, travel, etc.) as in the past. In other words, the budget became, in PPB parlance, oriented to "output" rather than input.

Efforts were begun to measure work done and to relate it to costs. A study by BOB explored the feasibility, value, and cost of systems to measure productivity, and the study concluded that such systems had considerable potential. The results of this study were published in 1964 and were used to stimulate action by agencies to develop such systems.

The Budget and Accounting Procedures Act of 1950 (64 Stat. 832), although not using the two specific words, established the legal framework for the "performance" or "program" budget. It also expressed the intent for the Comptroller General, the Secretary of the Treasury, and the Director of the Bureau of the Budget to conduct a joint program for the improvement of financial management. Such a program had actually been commenced late in 1947.

This program became known as the Joint Financial Management Improvement Program. As the result of a survey, initiated by the House Appropriations Committee, of accounting systems support for budget requests, the Joint Program had underway as early as 1951 an effort to encourage the development of budget patterns and accounts that would provide a common basis for program planning, budget preparation, accounting, and operational control. This evolved into the present plan for an integration of planning, programming, budgeting, and accounting.

An important related step was the enactment in 1956 of Public Law 863, 84th Congress, which specifically required the accounts of all executive agencies to be put on an accrual basis as soon as

practicable and provided for these agencies to develop their appropriation requests from cost-based budgets at such times as the President might determine.

6. *The development of formalized agency program planning* procedures moved slowly in the early part of the development period. However, in 1943 Executive Order 9384 also required the preparation of 5-year programs of all public works by the agencies involved and the summarization of these plans by BOB for the President's consideration. For many years, BOB required the departments and agencies to include cost information in their reports to congressional committees on proposed legislation. This requirement was enacted into law in 1956 (Public Law 84-801).

Longer range program plans were also used quite early in some other agencies, notably the Federal Aviation Agency, and the Forest Service in the Department of Agriculture. Beginning in 1961 BOB placed increasingly greater emphasis on longer range program planning and encouraged and assisted agencies in the development of program planning staffs. Most of the major agencies developed such staffs.

7. *Task forces or special commissions* to identify pressing national needs, to evaluate the effectiveness of present programs in meeting those needs, and to develop new policies and programs to meet any deficiencies were used effectively during the period of development although their use was accelerated under Presidents Kennedy and Johnson.

I have dealt at some length with what I consider to be antecedents of PPB to underscore the important point that it is not an "entirely new" or "revolutionary" system of budgeting as has been frequently stated; nor did it have its entire base in the Department of Defense as has been stated also. Rather, it was an outgrowth of a number of developments that took place over a long period of time, although it was not developed in as highly formalized a fashion as embraced in the President's announcement of 1965.

III. IMPLICATIONS OF PPB FOR THE CONGRESS

Having considered this long history of changing methods for developing budgetary proposals for the consideration of the Congress, we now turn to the question "In what ways will PPB change the form or substance of Executive Branch, legislative, and budgetary proposals for the consideration of the Congress?" Congress obviously plays a vital role in the decisionmaking process of our Government. It, therefore, has direct interest in the analyses which lie back of both legislative and budgetary proposals. It is interested in knowing what alternatives were considered and why certain alternatives were rejected. It is interested in what estimates were made with respect to long-term costs and how these estimates were arrived at. It is interested in knowing the basis for projected benefits.

Any procedure that results in better analyses and better information with respect to legislative and budgetary proposals should, of course, be of direct assistance to the Congress. This does not necessarily mean that the Congress needs to have all the "program memorandums," "work papers," "argumentation," etc., that lie behind Executive Branch

proposals. The Congress is entitled, however, to know why alternatives were not accepted and, perhaps equally important, to know whether an adequate analysis was made of available alternatives. Moreover, it needs to have available to it information with respect to long-term costs and benefits, total costs and benefits, the relationship of program growth in one agency to that of related or identical programs in another agency, and so on.

Beyond this the Congress has increasingly recognized the need for greater information with respect to proposed programs and alternative courses of action by:

- The enactment of Public Law 801 requiring 5-year projections of personnel and expenditure requirements of new legislation.
- Utilization of special analyses developed in the budget for review of programs on a Governmentwide basis.
- The grouping of subcommittee responsibility for appropriation hearings on the basis of related programs.
- Requirement for long-range estimates of cost and performance, economic analysis of alternatives, and ongoing evaluation. Legislation passed in 1956 authorizing the acceleration of the Interstate Highway System is an example. It required that the cost and economic impact of alternatives be considered in the selection of specific route locations, and that the total costs of the system be periodically reestimated throughout the approximately 15-year duration of the program.
- Provision for continuing evaluation of existing programs, such as in the Economic Opportunity Amendments of 1967.

Several proposals have been made with respect to courses of action the Congress might take which might shed greater light upon the dimensions of problems that are brought before it. Some proposals, involving the building of analysis capability and improved information systems in the Legislative Branch, have been made. Bills have been introduced in both houses of the Congress directed to this matter. The Legislative Reorganization Act of 1967, which passed the Senate in the last session of the Congress, is one example. This bill would call for specific support from the General Accounting Office in this regard.

Several of these bills propose creation of particular organizations to serve certain of the needs of Congress in this regard. Such organizations have been proposed as an Office of Program Analysis and Evaluation, a Joint Select Committee for Program Analysis and Evaluation, and a National Commission on Public Management. Each proposal has as an objective the increasing of the quantity and quality of information available to the Congress on the implications of proposed programs and the execution and results of existing programs.

In the past, the Congress, through its committees, and members, has made a great number of its own studies of problems with a view to formulating solutions. I expect that this will continue and that, even apart from charging any specific committee or organization with responsibility for adapting some of the more modern techniques to the analysis of problems at hand, such techniques will be used to a greater extent as time passes.

At this point in time, it is difficult to say just what the finalized expressed needs of the Congress will be. It is my understanding that the Executive Branch's view on the subject is this: with respect to the

extent of congressional discussion of the agency's plans and programs, the program analysis developed by the agencies under the PPB system is incorporated in budget requests and legislative proposal justifications. Program memoranda required of the agencies under the Budget Bureau's instructions are not available, as such, to the Congress.

In its consideration of legislative proposals and its evaluation of ongoing programs, the Congress and its committees should be able to inquire of the responsible Executive Branch officials as to the specific objectives sought, the alternatives which were considered, and the results of the analyses of the alternatives.

The Congress should also be able to inquire into the specific accomplishments of ongoing programs, and the degree of efficiency achieved in their execution, and expect to receive responsive information based on specific evaluations made by the Executive Branch; that is, regardless of whether the specific documents used by an executive agency in program analysis are available to the Congress, the substantive information should be furnished on request of the Congress.

As an agency of the Congress, we are considering the ways in which we can be more responsive to the needs of the Congress in this regard. We have established a small systems analysis staff in our Office of Policy and Special Studies and plan to build more capability in the use of analytical techniques both in that office and in our audits and evaluations of the management of ongoing programs. Although relatively new, our systems analysis staff has already made contributions to our efforts to serve the Congress. For example, it has recently made a survey of the practices of the major Executive Branch agencies with regard to the use of discounting techniques in assessing the cost and benefit implications of program decisions that underlie the fiscal 1969 budget requests. The results of this survey showing a wide variety of practices now in use were included in a report to the Joint Economic Committee, dated January 29, 1968.

The staff is also participating, in connection with a study that the Economic Opportunity Amendments of 1967 requires us to make, in assessing the potential for using economic and statistical analysis in evaluating the results of various programs authorized under that act that are directed to the alleviation of poverty.

The interest of the Congress in PPB may involve more than the long-term decision process of the agencies. From the practical standpoint there may be considerable interest by the Congress as to whether the PPB procedure itself can be improved. In other words, as evidenced by the inquiry of this committee, the Congress has an interest in the planning and budgeting system used by the agencies since it will always have to depend to a large extent upon agency information as a basis for its actions. Beyond this, the Congress has an interest in the cost of administering the PPB system itself, as it has in the cost of any management technique or device used in planning or administering agency programs.

To be more specific, I believe the General Accounting Office (GAO) can, depending upon the interest of the Congress, perform a useful role in several ways.

The GAO has recently undertaken in various executive agencies a survey of the status of implementation and the use being made of PPB. We are hopeful that the results of this survey, which will not

be completed for some time, will be useful to the Congress. The greatest values of our work lie in performing surveys for the Congress of the agencies' management systems and in approaching our audit responsibilities on a broad basis.

We will also be considering other studies in program areas that cross agency lines as well as giving increasing attention to the adequacy of cost information and other information on program results and to program effectiveness in our reviews. We consider that valid information on existing programs, including accounting data on program costs and comprehensive data on program accomplishments, is essential to the successful use of PPB. I believe, Mr. Chairman, that no amount of sophisticated analysis or, for that matter, of informed judgment can avoid error if cost information is wrong or lacking. (See attachment 2, p. 335.) Because of the complexity of effectiveness measurements, relatively more effort may be required to improve them. Both the costs and the effectiveness of each alternative must be viewed in proper perspective to permit a balanced judgment.

IV. LIMITATIONS, QUALIFICATIONS, AND POSSIBLE FUTURE DEVELOPMENTS

Most authorities on management sciences would probably agree that the processes of planning, programming, and budgeting are desirable processes. Such processes cannot, however, solve all the resource allocation problems that face decisionmakers.

The goals of our society cannot be simply stated. If our goal were solely economic efficiency with all its ramifications, then *perhaps* some one system such as PPB would guide us toward that one ultimate objective. But we do not seek one goal. Instead, we have numerous goals, such as security, progress and prosperity, freedom of choice, strengthening of the free private enterprise system, and many others. These goals cannot in all cases be accomplished to be consistent with the highest degree of economic efficiency. Priorities among our national goals are not easily agreed upon, and in the final analysis must be established largely through the operation of our political process. Although PPB can generate information useful to this process, it is quite easy to "oversell" the PPB contribution to the determination of national priorities.

One of the most significant problems in the planning and programming processes is the problem of measuring the contribution that existing programs have made toward achieving stated goals and assessing the potential contribution of alternative programs. The problem of defining measurement criteria is especially complex when we seek to measure effectiveness of social programs. Measurement criteria must directly reflect the goals or aims of a program if the criteria are to allow reliable measurement of effectiveness. However, absolute agreement on goals and aims is often lacking, and the relative weight to be given different specific objectives often defies definition. What criterion will permit us to choose between saving one human life and preventing a large number of cases of blindness? If we are choosing among lives to save, what criterion tells us which lives?

Perhaps I can make the problem more concrete with an example from another area. One of the objectives of the U.S. Information Agency (USIA) is to help achieve United States foreign policy objec-

tives by influencing public attitudes in other nations. The development of measures of effectiveness to evaluate progress toward this objective is a problem that requires continuous analysis because public attitudes change irrespective of USIA efforts and because the effectiveness of particular media may not remain constant over a period of time.

Although USIA has recognized the desirability of determining the effectiveness of particular media on public attitudes, it has not been able to do so in all cases. For this reason objectives are stated in terms of exposures of target groups to various media. The relative effectiveness of the media on attitudes, that is on the agency's ultimate objective, must at the present time be measured by subjective evaluations.

Other examples of where actual or potential program results cannot be readily quantified and it is necessary to emphasize the processes that underlie such programs, are :

- (1) the community action programs in the Office of Economic Opportunity which, by involving local groups in the political processes, may bring about the strengthening of local governments followed by institutional changes, a goal sought by the programs ;
- (2) the Peace Corps where it is not possible to describe the benefit of the project in a country in terms of the project's contribution to the gross national product ; and
- (3) the whole area of basic research.

Joint program participation by the Federal Government and other entities also makes it difficult to define all program implications and other factors. I believe the public works and economic-development programs of the Department of Commerce serve to illustrate the problems that arise in these circumstances. Under these programs several types of aid are available to both governmental and nongovernmental entities to promote the economic development of depressed areas. In determining the way in which the resources should be allocated, at what level should the agency try to make the decision? There are redevelopment areas, economic development districts that contain two or more redevelopment areas, economic development regions that contain two or more districts, and of course, the whole country. The Government does not finance total investment costs and in general does not participate in operating and maintenance costs. There can be several entities at each level with which the Federal Government can deal. The role of the Government is only to encourage, assist in, and approve the planning at each level—it cannot dictate what is to be done.

Similar difficulties exist in most of the programs that involve foreign Governments. These circumstances, plus the involvement of a number of other Federal agencies in foreign countries, make the problems of implementing PPB in the Department of State quite difficult. Some of these problems and the status of PPB in the Department of State were discussed in the memorandum prepared for this Subcommittee by Dr. Thomas Schelling.

My understanding of Dr. Schelling's position is that he believes that PPB, at least the PPB approach, is needed in the field of foreign affairs if there is to be effective coordination of foreign policy. He noted that, although foreign affairs is complicated and disorderly and timely judgments cannot always be made on the basis of output from an orderly analytical process, the present decisionmaking system can be improved. In this improvement, the PPB philosophy will even-

tually play a significant role. Dr. Schelling would like to see the Office of the Secretary of State use the budget process to clinch its authority and to rationalize its decision processes.

Responding to our recent PPB survey inquiry, the Department of State advised us on March 21, 1968, that:

In a letter to the Secretary dated March 10, 1967, the Director of the Bureau of the Budget deferred the development in State of a comprehensive PPB System such as that to which you refer. Following is an excerpt from that letter:

* * * We have modified our earlier plans so that it will not be necessary to submit a Program and Financial Plan to us this spring or summer, unless it is specifically requested later. Similarly, we do not contemplate requiring any formal spring submission of figures for the 1969 budget. Also, in view of unresolved questions regarding establishment of a Foreign Affairs Programming System and the limitations we experienced last year with the Department's Program Memoranda, Program Memoranda need not be prepared this year except for the educational and cultural exchange programs of the Department * * *.

In recent conversation with the Bureau it has been further agreed that work on a general System for the Department will not be renewed until decisions are made regarding an inter-agency Foreign Affairs Programming System that is still being explored.

It seems clear that much more study will be required to resolve the broad question of applicability of PPB to the field of foreign affairs. However, we are concerned that those activities that are essentially service and support functions, such as the Foreign Buildings Operation, the State Department's Shared Administrative Support function, the Foreign Service Institute, and others, be separately identified for necessary development of acceptable accounting systems and program cost information as a step in evaluation of these programs. We are working with the Department of State to delineate such operating functions and to proceed with needed improvements without awaiting the resolution of the broader questions of foreign affairs.

Faced with the difficulties I have described, budgeting must in the final analysis remain a function of responsible judgment, not an expression of dollar absolutes, and the allocation of financial resources among vigorously competing claims can never result from the application of any formula. We live in a dynamic society, a plural society, and this very pluralism produces a contest of priorities and values. When the chips are down, and since we must deal with relatively finite resources, we are unlikely to produce the complete harmony of satisfaction that each claimant seems to expect.

It would be extraordinary, in fact, if a dynamic society did not have expectations and aspirations and goals that surpassed its immediate resources. I think we should not be unduly frustrated when these aspirations must be achieved in an orderly way, in a framework of balance, and in a perspective of our total needs and problems. In a directed society, we would probably have less worry about priorities; in an open society, we have a collective responsibility to determine our

common and best interest. And the budget is one device—a very important device—for relating values and expectations to resources.

There is no assured way to bring the decisionmakers down to one right answer. If there are many who want vastly greater expenditures for national security programs, there are others, just as dedicated, who want that money for school construction, for medical research, for farm subsidies, for service pensions, for roads, for housing, for urban renewal, for science, for outer space exploration, for pay raises—the list knows no limits and is not static. Even a Federal budget that has multiplied more than ten fold in the last 25 years cannot satisfy all these claims.

Also, the decisionmakers in the Executive Branch and the Congress are to some degree bound by what has happened in the past. In many areas, past decisions have resulted in substantial investments and commitments which limit courses of action that are practically available. In some cases, major changes in resource allocation can be accomplished only gradually over a period of time.

Despite these limitations and complexities, however, we cannot afford to overlook any techniques that are available to put a finer edge to the decision process.

Mr. Chairman, I have attempted in this testimony to briefly highlight my views with respect to PPB, particularly as it affects the work of the Congress and, to some extent, the work of GAO. I have also explored some of the problems which must be solved to fully realize the potential of PPB. I believe recognition of these problems explains to a large degree why there is a significant body of opinion that PPB has been oversold. Perhaps the proponents of PPB have not been careful enough to delineate what it can do best from the areas of decision-making in which it may flounder. The multiyear total program visibility provided by PPB can potentially improve the basis for major program decisions. To do this, it must be supported by sound analysis based upon reliable measurements of costs and program outputs. There has been a considerable amount of research to solve the difficult analytical problems. There has been much improvement in the past 20 years in both the process and available information upon which the budget is prepared and reviewed. I believe it is reasonable to expect a continuing improvement in the quality of the information and the analysis. But, if past efforts to improve the budget process are at all indicative, it is too early to make a definitive evaluation as to changes that may be needed in the PPB system as presently prescribed.

Attachment 1

DIFFERENCE IN BUDGET SUBMISSION BEFORE AND AFTER PPB

Considerable insight can be gained regarding differences between the Department of Defense budget submission before and after PPB by reference to the statement of the Secretary of Defense before the Subcommittee on Department of Defense appropriations of the Committee on Appropriations of the House of

Representatives, for fiscal year 1963. The following quotations from Mr. McNamara's statement are relevant:

* * * This is the first defense budget prepared wholly by President Kennedy's administration. It is also the first to be developed under the new program and budgeting procedure. Under this new procedure the defense program is developed in relation to the principal military missions of the Defense Establishment, rather than by organizational component as in the past. * * * Mr. Hitch will summarize the defense budget in the traditional manner by budget category and by appropriation title. * * * To present the program, I will have to cover a considerably broader scope than has been the custom in the past. * * * I will discuss the programs primarily in terms of forces and quantities of weapons and equipment, and not only for fiscal year 1963 but also for the 5 years through 1967.

The following statement by Mr. Mahon followed:

* * * I think this change, which has been in process for a number of years to some extent, is a marked improvement over anything we have had in the past.

There are repeated references throughout the testimony to the major changes between fiscal years 1962 and 1963 by program, e.g., a 3.1 billion increase in strategic force funds for the 2-year period, fiscal years 1962 and 1963 combined.

The programming system was implemented very rapidly, and was as yet incomplete, particularly with regard to financial projections beyond the budget year. The Secretary stated with regard to the future budget level that he was "reluctant to present it to the committee because it is a very crude structure at the present time."

References to the Secretary's testimony one year before in support of the fiscal year 1962 budget indicated a considerably greater uncertainty on his part about future program costs. He stated doubts at that time about the ultimate costs of Skybolt. By 1963, he had concluded that the R&D cost would go from the original estimate of \$170 million to approximately \$500 million.

The difference between the traditional and the program budget submissions can be shown in summary by the following extracts from the hearings:

TABLE I.—*Financial summary, fiscal year 1963 programs*

[In millions]		<i>Fiscal year 1963 budget estimates</i>
<i>Program</i>		
1. Strategic retaliatory forces.....		\$9, 361
2. Continental air and missile defense forces.....		2, 052
3. General purpose forces.....		18, 413
4. Sealift-Airlift forces.....		1, 298
5. Reserve and guard forces.....		1, 868
6. Research and development.....		5, 667
7. General support.....		12, 803
8. Civil defense.....		695
9. Military assistance.....		1, 500
Proposed legislation for quarters allowance, etc.....		220
Total obligational authority.....		53, 877
Deduct financing adjustments.....		2, 237
New obligational authority.....		51, 640

Tables I and II are extracted from Department of Defense appropriations of the Committee on Appropriations of the House of Representatives for fiscal year 1963, 87th Congress (Table I on p. 161; Table II on p. 290a).

TABLE II.—*New obligational authority, fiscal year 1963—by functional title and service*

[In millions]	
Military functions:	
Military personnel.....	\$13, 675
Active Forces.....	11, 948
Reserve Forces.....	668
Retired pay.....	1, 059
Operations and maintenance.....	11, 609
Procurement.....	16, 445
Aircraft.....	5, 488
Missiles.....	4, 011
Ships.....	2, 982
Astronautics.....	—
Ordnance, vehicles, and related equipment.....	2, 004
Electronics and communications.....	1, 211
Other procurement.....	749
Research, development, test, and evaluation.....	6, 843
Military sciences.....	909
Aircraft.....	437
Missiles.....	2, 200
Ships.....	234
Astronautics.....	1, 158
Ordnance, vehicles, and related equipment.....	220
Other Equipment.....	779
Programwide management and support.....	756
Emergency fund.....	150
Military construction.....	1, 318
Active Forces.....	1, 277
Reserve Forces.....	41
Civil defense.....	695
Revolving and management funds.....	—
Subtotal.....	50, 585
Available by transfer from working capital funds.....	—445
Total military functions.....	50, 140
Military assistance.....	1, 500
Grand total, DOD-Military (military functions and military assistance).....	51, 640

Attachment 2

THE IMPORTANCE OF COSTS TO PPB

Dollar costs are a common measure of resource requirements. Accurate measurement of costs is no more important to PPB than accurate measurement of effectiveness or benefits. Cost measurement (accounting or estimating) is a subject which can be discussed in common across many programs. On the other hand, principles regarding output measurements must be established

for similar categories of programs. Therefore, it is possible to treat the cost side of PPB generally but not the output side, except in rather abstract terms.

Four points related to program costs should be made clear.

—First, cost information is needed to analyze and plan for the most efficient mix of resource inputs.

—Second, cost information is needed to enable managers to control efforts undertaken to achieve chosen objectives.

—Third, information related to program costs is needed even where it is not possible to quantify the benefits from alternative programs; cost information will nearly always assist managers in planning and programming to meet the objectives for which they are responsible.

—Fourth, cost information is needed to assure the Congress that the monetary constraints imposed on an agency have not been exceeded.

Measurement of costs is difficult and must satisfy varied decisionmaking needs

The identification and measurement of relevant costs is a task for many departments and agencies that may well be at least as difficult as identifying and measuring benefits from programs. The difficulty is due, in part, to the fact that costs and alternatives that are relevant to one level of program decisionmaking are not necessarily relevant to other levels. Still other costs and alternatives may be most relevant to the work of the Congress.

As a general rule one might say that larger portions of the costs are relevant to decisionmakers as the decisionmaking level is raised. Thus costs relevant to decisionmaking by a health inspector are less than those by the head of the inspection department because the inspector has fewer decisionmaking alternatives available to him than does the head of the inspection department. It may be that the head of the department can give consideration to alternatives such as a new complaint system or a new procedure that are not available to the inspector. The inspector must limit his alternatives to those on which he has the authority to make decisions or recommendations.

Difficulty of providing costs for various purposes from accounting systems

Cost information must also be used for matters other than planning and programming. A historical record of costs incurred to carry out programs is indispensable both as a record of stewardship and as a means of control to assure that budgetary constraints set by the Congress, by the Bureau of the Budget, or by the agency or department concerned are not exceeded. In fact, it may be desirable to establish requirements and guidance for the government-wide accumulation of program cost histories, which would show the original estimates, major changes, and final actual costs.

Not all agency accounting systems produce program cost information. Thus, it is not always possible to compare actual costs incurred for programs and benefits generated with planned costs and the benefits. In order for managers to have the kind of information they need to evaluate their progress, they must have cost information related to programs, and to be meaningful such information must be stated on an accrual accounting basis.

Reporting costs on a program basis can be complicated. These complications are due to the fact that organizational structures, responsibilities for carrying out operating programs, and budget structures maintained in accordance with the needs and desires of the reviewing legislative body frequently do not neatly coincide.

In recognition of the need for program cost information, in support of PPB, the heads of departments and agencies were notified on April 4, 1967, of a change in the principles and standards for accounting systems prescribed by the General Accounting Office. As revised, these standards provide in part that:

The accounting system must provide not only the basis for control over funds, property, and other assets but must provide an accurate and reliable basis for developing and reporting costs of performance in accordance with (a) major organizational segments, (b) budget activities, and (c) the program structure adopted under the planning-programming-budgeting system prescribed by the President for executive agencies.

To meet the statutory objectives of full disclosure of the financial results of agency activities, the production of adequate financial information for agency management purposes, and support of budget justifications with per-

formance and program cost data, the accounting system must provide for the systematic accumulation of cost information by:

1. Major organizational segments
2. Budget activities
3. The program structure adopted under the planning-programming-budgeting system prescribed by the President for executive agencies

Such data may be obtained from either the accounts employed or by appropriate cost-analysis techniques in circumstances where the maintenance of detailed account classifications for this purpose would not be justified.

However historical costs are classified in the information and accounting systems, they will not necessarily be the costs most useful for planning and programming purposes. As a general rule, incremental costs must be used to evaluate and compare alternative future programs, and these costs do not appear in agency records. Sunk costs, i.e., costs which have already been incurred and which are recorded in agency records are not generally relevant to the decisions regarding new or alternate programs since sunk costs are not retractable. Historical (or sunk) costs are frequently of considerable use as a basis for analysis and projection and displays of these costs can be quite helpful to decisionmakers, e.g., in evaluating actual costs vs. actual benefit received from various types of programs.

These statements about costs are intended to clarify one of the confusing aspects of PPB. There is, we believe, some danger that efforts to make sophisticated analyses of relatively intangible program benefits will overshadow the benefits both from the control and the planning viewpoints that can be obtained by analyzing the costs of proposed or alternate programs. The point is that it should not be assumed that measurement of benefits is the only part of the PPB system in which improvements can and need to be made. Better cost information is generally needed by Federal managers if they are to effectively carry out their planning, programming, and control responsibilities.

These comments are not intended to minimize the need to evaluate the benefit aspects of programs. There is quite obviously much that can be done to improve our understanding of the benefits of particular programs. In fact, if the benefits of programs are not given adequate consideration it is possible to be very efficient in undertaking a program that should not be undertaken at all. An understanding of program costs may be of significant assistance in becoming efficient, but may be of little value in understanding the effectiveness of a program.

Cost determination in the Department of Defense

Much has been said and written about the PPB system and the cost/effectiveness basis for decisions in the Department of Defense. Less has been said about the way in which these costs are determined, and some mention of it seems appropriate here.

The various organizations which do effectiveness analysis in the Office of the Secretary of Defense and under the Service secretaries and chiefs do not normally determine the estimated costs of the alternatives which they are comparing. Instead they use costs provided to them by Service cost estimators, or if these are not available, by equipment contractors. It is very important that we realize at all levels the importance of accurate, unbiased cost estimates. No amount of sophisticated effectiveness analysis, or for that matter of informed judgment, can avoid wrong decisions, if the cost information is wrong or lacking.

The Department of Defense has been a leader in development of information systems for the support of cost needs. The emphasis on program management needs has to some extent obscured the important work of improving the departments' independent cost estimating capability which is of primary importance for providing the resource inputs to the PPB system.

The progress in this estimating capability is exemplified by the three annual cost research symposiums which have been planned and conducted jointly by cost analysts from the Office of the Secretary of Defense and the Services. This provides an opportunity to these analysts to learn new methods and an incentive for them to develop new methods which are worthy of display. Examples from the recent 1968 symposium deal with such topics as Pilot Training Cost Methodology and Cost Trade-Offs in Logistics Guidance.

Progress in developing estimating capability in the Department of Defense has been hampered by the lack of consistently defined data banks. Many *ad hoc*

studies have provided some data but the only permanent solution will be the installation of data accumulations which are consistent throughout the Services. One such system is the Cost Information Reports (CIR), which was approved in April, 1966, for the collection by all three Services of cost data from contractors and major subcontractors who are involved in major weapon or support system design and production.

The General Accounting Office will give increased consideration to the ability of the agency accounting systems to provide the kind of historical data banks which are the life blood of any system designed to provide reliable and unbiased cost estimates.

AVAILABILITY OF INFORMATION TO CONGRESS

Senator JACKSON. Mr. Staats, the Chair would like to compliment you on a clear-headed presentation of this whole matter. I am very much impressed with the analysis that you have made of this system of analysis. Your interpretation of the history of PPB is very interesting. I note that you have identified and carefully documented the origins of the several aspects of PPB. I am reminded of the adage that there is nothing new under the sun.

I must commend you for the professional way in which you have prepared this statement. I think it is excellent.

At the start I would like to ask a few questions relating to the role of Congress in the decision-making process, and to the problem faced by Congress in obtaining the kind of information it needs to carry out its constitutional responsibilities.

You made the point that while Congress is not able to get the PPB program memoranda, we are able to get answers to questions about the alternatives considered and the substantive matters which lie back of the legislative and budgetary proposals from the Executive Branch.

Is that correct?

Mr. STAATS. That is correct.

Senator JACKSON. Can the GAO itself obtain the specific program memoranda?

Mr. STAATS. I think we are under the same restriction that the committees of Congress are under with respect to obtaining the specific memoranda which are provided for under the Bureau of the Budget's instructions to the agencies, in that those memoranda are regarded, at least until the budget is presented to the Congress, as privileged information, being a part of a basis for Presidential decisions reflected in the budget.

The question of five-year projections, however, is a little different in that the agencies here are responsible under the law, under Public Law 801 of the 84th Congress, for supplying Congress with information with respect to both personnel estimates and financial estimates for a five-year period in reports or recommendations relating to pending or proposed legislation.

This is an old law and it has been honored more in the breach than it has been in the observance. I think we would have to frankly recognize that in many cases the agencies and the committees have not really been too much interested in developing a projection because these projections frequently indicate a very considerable growth in personnel and in costs.

This type of information would then play into the hands of the opposition who would use it to argue against the legislation.

I think there is a somewhat similar problem with respect to some of the internal program analyses that are made that go into the PPB System. Although there is a desire on the part of an agency head and the Bureau of the Budget to encourage full and frank discussion, some of the differences may border on personalities, and some of them have political overtones to them; the agency's concern has been in part that making such documents available in a public arena would discourage frank analysis internally.

But once the budget is submitted, I think you have a different situation.

The same thing applies with respect to a legislative proposal. Here I think the difficulty has been to identify in a careful and precise way—I am generalizing here, as this cannot be applied in all cases—the issues on which Congress is going to insist the agencies develop analyses for the committees.

There are some situations, undoubtedly, where Congress is not willing to rely on that information. In other words, they regard it as being prejudiced, or biased, or certainly emphasizing only the points that the agency wants to emphasize.

But I would think that the Congress, with the resources that it has available to it in the staffs of the committees, the Library of Congress, and the General Accounting Office, could find out to what extent those agency submissions do check out.

In other words, what I am saying is that I do not believe that the Congress, in general, has taken full advantage of what is available to it.

I have identified five kinds of situations in my statement (see p. 328) to bring out this point. I am not sure that a new entity, such as has been suggested in a number of bills in this last session of Congress, would add a great deal to the total capability that Congress has available to it.

I haven't even mentioned the availability of information that comes from the outside, from organizations which are interested. Many times the Congress will get the dialogue of people who are for and against, who bring out issues, and who bring out points which the committees can then follow up with Executive Branch agencies, with us, or with the Library of Congress or their own staff to develop.

IMPROVING CONGRESSIONAL STAFF CAPABILITY

Senator JACKSON. In that connection, I have two questions.

Do you think that the Congress might well improve its staff capability on key committees, with people who have special analytical ability and knowledge in the area under consideration, who could be helpful in getting the kind of information that would be useful to the committee members in reviewing the budget?

Mr. STAATS. Yes, I think so.

I think these people are available already in a great many cases in the committees. I think they are available on a consultant basis in many instances. We hope to increase our own capability, irrespective of whether the Legislative Reorganization Act of 1967 is finally en-

acted by the Congress, to work with the committees, if not to do the studies themselves, then at least to be able to help formulate the right kind of issues and questions.

I think in some cases we can draw upon our own audit capability to do this.

Senator JACKSON. I personally believe that committees on the Hill could improve their capability and the quality of their work by bringing in as consultants from time to time able people who have a special expertise in a given area. Such consultants, I think, by doing selective analyses or studies on important problems, before we actually start hearings on a given program, can make a real contribution to our review of the budget.

I have personally felt that Congress should make greater and better use of first-rate consultants in our program and budget reviews.

HELP TO CONGRESS FROM GAO

The other question I had in mind is this: What can GAO do to assist the committees and the Congress in this regard? You said you are building up a staff and working to a substantial extent in this area. What sort of service could be provided for the Congress?

Mr. STAATS. We see the need in GAO to increase our knowledge and proficiency or capability in this area from at least three standpoints.

For one thing, we want to be in a position to assist the Congress in connection with hearings or studies made by committees, in helping shape up and formulate those studies which would be made directly by the committees of the Congress.

Second, there will be other studies of the kind we are now making, which is a review of the effectiveness of the poverty programs. We did not initiate this study, but were required to make it by title II of the Economic Opportunity Act passed by Congress last December. This is new in the sense that it calls on us for the first time in an explicit way to review not only the management but also the effectiveness of the program. In other words, to what extent has its performance accomplished the objectives that the Congress established in the original enactment of the legislation?

Third, we hope and expect to be able to undertake studies of this kind under our own authority, under the broad authority that we have under the Budget and Accounting Act. How fast we can do this, and how many of these studies we can make will obviously depend on the capability and the total number of our staff that can prepare these kinds of analyses.

I mentioned the study we did on the discounting problem in evaluating costs and benefits.

We are also making a general review of the PPB system, itself. We have given this a fairly high priority because if we can develop for Congress information and recommendations on the management of the whole system, maybe we will have more impact than we could with any specific subject matter studies that we would make.

These are three ways in which we see GAO as having some contribution to make to the Congress in this area.

Senator JACKSON. Mr. Staats, the emphasis in GAO has been on auditing after the event. In your judgment, can GAO be drawn in before the adoption of legislation?

Mr. STAATS. Yes.

This presents, of course, in the first instance, the question of the interest of the committees in having GAO involved at that stage. I think the general answer to your question is yes.

We are, for example, having discussions currently with the Joint Atomic Energy Committee, and I believe you are familiar with this development, that we assist the committee in the evaluation of the Sentinel Program as it proceeds, with respect to both the AEC part and Department of Defense part of the program.

This is a very large program, as you know. The estimates are running as high as \$5 billion and over. I do not know that we have been involved in a proposal in quite this way, certainly not since I have been with the GAO. We were fairly deeply involved, at the request of the same committee, in the program on releases of uranium for peaceful uses. We made a very major study for the committee in that area last year.

Neither case represents technically a cost-benefit study, but each certainly will have elements of that in terms of the kinds of problems and issues that we would hope to identify for the committee as we go along.

Senator JACKSON. I am sure the Congress cannot expect GAO to do the full staffing job that needs to be done on the Hill, but I am also sure that from time to time there will be areas in which a pre-audit can be done by GAO which would be extremely helpful in trying to determine what action should be taken on a given bill.

Mr. STAATS. We do have very able and skilled people, and we have individuals who are located in the field familiar with the contractors and agencies involved, and who, we think, have unique capability to be of direct assistance to the committees.

The Sentinel Study, as we now see it, will involve at least 25 of our professional staff people to cover all of the major contractors and all of the installations that are involved in the programs.

ISSUES OF EXECUTIVE PRIVILEGE

Senator JACKSON. With regard to the problem of executive privilege, in your judgment is the privilege justified? You served for many years in the Bureau of the Budget, in the Executive Branch. You know the problems that exist in the Executive agencies.

I am wondering if we are not going to run into real trouble, at least if the privilege is carried too far. It is essential that Congress have the ability to really analyze the fundamental premises on which a proposal or decision has been made. Otherwise, we are just going to be snowed by a mass of information that is available to the Executive Branch of the Government and not to the Legislative Branch.

Mr. STAATS. This is a very difficult line to draw.

Senator JACKSON. It always has been.

Mr. STAATS. It has been for many, many years, a source of controversy between the Executive Branch and the Congress under both Democratic and Republican Administrations.

It goes to the central question of separation of powers, and to the wording of the Budget and Accounting Act itself which places the responsibility for budget proposals on the President.

Through the development of this issue over a number of years the Bureau of the Budget issued a circular, with the approval of the President. I have here the issue dated in 1964, which is a revision of prior issuances. It contains the ground rules and the guidelines on the release of information pertaining to the budget, but it also makes clear that—well, I might read briefly.

Senator JACKSON. If there is no objection, we might have this entire circular go into the record.

Mr. STAATS. I think it is quite pertinent, Mr. Chairman, to your general question.

(The circular referred to follows:)

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., January 18, 1964.

CIRCULAR No. A-10 REVISED

To: Heads of Executive Departments and Establishments.

Subject: Responsibilities with respect to the budget.

1. *Purpose.* This Circular revises Bureau of the Budget Circular No. A-10 dated April 15, 1954. Coverage of the Circular and the policy on support of the President's budget are clarified, but without significant change in substance from instructions previously issued (paragraphs 2 and 6). A statement is added on discussing the possible need for supplemental appropriations (paragraph 5). Changes in appropriation language or amounts, and significant changes in program not requiring a change in appropriation language or amounts, are to be cleared with the Bureau of the Budget (paragraph 7).

2. *Background and applicability of Circular.* The Budget and Accounting Act provides that there will be presented to Congress for its consideration and action an executive budget for which the President is responsible. The law requires that the budget represent the judgment of the President with respect to the financial requirements for all parts of the Government except the legislative branch and the judiciary.

In addition to the budget documents submitted by the President to Congress annually, this Circular is applicable to budget amendments, supplemental estimates, and other proposals for the granting of new obligational authority, which are transmitted or revised after the presentation of the original budget each year. Furthermore, this Circular relates to estimates for the year for which the budget is presented and for the year then current, but not to factual data pertaining to past fiscal years.

3. *Restrictions on disclosure of agency estimates.* All budget estimates and supporting materials submitted to the Bureau of the Budget are privileged communications. Their confidential nature must be maintained, since they are the basic data and worksheets in the process by which the President resolves budget problems and arrives at conclusions with respect to his recommendations to the Congress. The head of each agency is responsible for preventing disclosure of information contained in such estimates and materials except on request in formal appropriation hearings and when requested by Members of the Congress in connection with their consideration of the budget after its transmittal.

4. *Restrictions on premature disclosure of Presidential recommendations.* The decisions of the President as to his budget recommendations and estimates are administratively confidential until made public by the President. The head of each agency is responsible for preventing premature disclosure of information as to such recommendations and estimates. This rule does not apply, however, to the presentation of data on the President's budget to the Appropriations Committees, pursuant to arrangements made in specific instances by the Bureau of the Budget, in connection with any formal hearings on the budget which may be held prior to the actual transmittal of the recommendations of the President.

5. References to supplemental appropriation requirements. Paragraphs 3 and 4 relating to restrictions on disclosure of agency estimates and Presidential recommendations apply to supplemental as well as to annual estimates. However, if a supplemental request is being considered but has not yet been recommended by the President, a witness may appropriately mention the fact, but should not state the amount which he thinks is needed, unless this information is explicitly requested. An agency witness may also refer to the following:

a. Amounts in the budget document which indicate the probable need for additional appropriations;

b. Facts which have been laid before Congress in connection with appropriations made by the Director of the Bureau of the Budget which anticipate additional appropriations; and

c. Cost data which have been submitted to Congress on proposed legislation in accordance with the Act of July 25, 1956 (5 U.S.C. 642a).

6. Agency testimony and communications on budgetary matters. In answering questions about appropriations and budgetary matters, care must be taken by officials and employees of the agencies to avoid conflict with the terms of the Acts quoted below.

The Budget and Accounting Act of 1921 provides in part that:

No estimate or request for an appropriation and no request for an increase in an item of any such estimate or request * * * shall be submitted to Congress or any committee thereof by any officer or employee of any department or establishment, unless at the request of either House of Congress. (31 U.S.C. 15)

The 1948 revision of Title 18 of the United States Code provides that:

No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers or employees of the United States or of its departments or agencies from communicating to Members of Congress on the request of any Member or to Congress, *through the proper official channels*, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business. (18 U.S.C. 1913, emphasis supplied. This section also provides penalties for its violation or attempted violation.)

Officials and employees will be guided by the following policies pertaining to budgetary matters when testifying before any congressional committee or communicating with Members of Congress.

a. Frank and complete answers will be given to all questions of fact.

b. Personal opinions will not be volunteered which reflect positions inconsistent with the program and appropriation requests the President has transmitted to the Congress.

c. In expressing personal opinions relating to such program and appropriation requests in response to specific requests therefor, witnesses will refer to the extent, if any, to which these opinions differ from the President's recommendations, and should make clear that the expression of the opinions is not a request for additional funds. Witnesses typically bear responsibility for the conduct of one or a few programs, whereas the President must weigh all of the needs of the Federal Government against each other and against the revenues available to meet such needs; where appropriate, witnesses should call attention to this difference in scope of responsibility.

d. Where a written submission is requested which will involve a statement of opinion relating to program and appropriation requests the witness will arrange for a reply to be provided through the head of his agency.

7. Clearance of changes in program under budget requests. If an agency desires to propose changes in appropriation language or limitations recommended in the budget prior to their enactment, such proposals are to be presented to the Bureau of the Budget in writing for appropriate clearance. When it is found possible to reduce the amount of a request for appropriations before action has

been taken by either Appropriations Committee, the head of the agency will promptly inform the Bureau of the Budget. If significant changes are planned in the amounts or conditions relating to one or more programs, without changing amounts on which Congress has been requested to act, the agency will inform the Bureau of the Budget, and after appropriate clearance, should place the matter before the Appropriations Committees. This procedure applies not only to appropriations, but also to budget estimates not necessarily involving appropriations, such as budget statements under the Government Corporation Control Act.

8. *Reductions made in appropriation bills.* The final authority for appropriations rests with the Congress. Its action is based on extended hearings and recommendations by the Appropriations Committees and is taken only after consideration by each body as a whole. Any decision by an agency head to request restoration of a reduction should be carefully considered, taking into account the reasons for the reduction, the circumstances under which it was made, its significance from the standpoint of the President's program, and other factors which may be relevant.

9. *Control of expenditures.* The processing and implementation of the budget falls under the terms of the Budget and Accounting Act, 1921, as amended (31 U.S.C. 1-24), and of the Antideficiency Act (Section 3679 of the Revised Statutes, as amended). The requirements of these acts should be familiar to all departmental and agency officials whose duties are related to budget preparation, submission, and implementation.

Particular attention is directed to the report of the House Committee on Appropriations on the General Appropriation Bill of 1951 (House Report 1797, 81st Congress) which contains the reenactment of the Antideficiency Act and indicates the intent of the Congress. This report states, in part:

Appropriation of a given amount for a particular activity constitutes only a ceiling upon the amount which should be expended for that activity. The administrative officials responsible for administration of an activity for which appropriation is made bear the final burden for rendering all necessary service with the smallest amount possible within the ceiling figure fixed by the Congress. Every official of the Government who has responsibility for administration of a program . . . [has] responsibility to so control and administer the activities under his jurisdiction as to expend as little as possible out of the funds appropriated.

KERMIT GORDON, *Director.*

Senator JACKSON. Read whatever part you deem necessary.

Mr. STAATS. The particular point I want to bring out is:

Officials and employees will be guided by the following policies pertaining to budgetary matters when testifying before any congressional committee or communicating with Members of Congress.

a. *Frank and complete answers will be given to all questions of fact.*

b. *Personal opinions will not be volunteered which reflect positions inconsistent with the program and appropriation requests the President has transmitted to the Congress.*

The key words here are "will not be volunteered," because in response to questions agency representatives are required to respond to any question with respect to, for example, what was requested by a bureau or department head, or what the department head requested of the Bureau of the Budget, or whether there was an appeal from the Bureau of the Budget to the President.

In other words, there is no restriction insofar as responding to a direct question by a committee member to a witness appearing before the Congress. The admonition is on the volunteering part.

This is the very fine line that Circular A-10 attempts to draw with respect to the concept of a Presidential budget and the integrity of the President's budget.

Senator JACKSON. Some of these documents, of course, could be sanitized to avoid confidential matters, personality situations, and so forth that obviously are always present.

I do think it is important that there be the kind of climate in the Executive agencies in which people can freely express themselves without fearing the prospect of a long and rigorous interrogation before some Congressional committee at some point in the future. I think there is a need to encourage a climate of free expression—free discussion pro and con—in order to get the best possible results within the Executive Branch.

On the other hand, I also think that with the kind of a program budgeting system we are talking about, Congress needs to know what really went into the reasoning by which alternative programs were accepted or rejected, as a basis for penetrating interrogation and questioning by the Congress.

Unless that information is available to us and we have access to it, we can't exercise the art of cross-examination to get the truth and to help us see the pitfalls as well as the possibilities in executive proposals.

As I view this program budgeting-policy analysis effort, if it is done right, it provides the basis for deeper probing of program proposals and their consequences. The system is not an end in itself, but if used properly it should be able to help us to find better answers and to improve things.

Mr. STAATS. Without attempting to be at all devious about the matter, it seems to me that the Congress could obtain literally the same information that is contained in the program memoranda, provided that the questions were able to identify the substance of these issues.

Senator JACKSON. Senator Baker.

Senator BAKER. Mr. Staats, as you have pointed out, Congress, by and large, does not have access to specific program memoranda, work papers, and argumentation of the Executive agencies. For whatever it is worth, I have much doubt that the Congress should have access to program memoranda, argumentation, and the like, of the Executive Department, any more than the Executive Department should have that kind of access to committees of Congress.

I do wonder if there isn't a real gap between the Executive Department and the Congress and its committees in the basic data and information on which their judgments and decisions are made.

Would you agree that generally such a gap exists in all of Congress' activities related to the Federal budget and in the Congress' examination of proposals from the Executive Branch?

Mr. STAATS. The gap, as I see it, has more to do with alternatives that might have been considered, with respect to a given program.

In other words, Congress can certainly ask "Why didn't you ask for more?" Or, "Why did you ask for this much?"

What I am thinking about is the basically different possible approaches to accomplishing the objective. In the pollution field, for example, there are many ways of approaching this problem, and over different time phases. There is a difference in the mix between private and public effort, for example.

It seems to me that Congress is lacking the backup with respect to the "why" of one approach as against another. I don't think Congress is lacking the ability to say, "If we give you this much money, half as much as you are asking for, what is that going to do to you?"

This is done all the time. But what is lacking, it seems to me, is the ability to identify different approaches to accomplishing given objectives and getting a good analysis and backup as to why one approach is adopted as against another one.

Senator BAKER. Thank you.

Senator JACKSON. Senator Mundt.

Senator MUNDT. Mr. Staats, first I want to congratulate you on a very fine statement. I think it is one of the most comprehensive and most illuminating we have had in this whole field of the planning, programming, budgeting process. You have done an excellent job.

A minute ago you were talking about a 1964 circular. What is new in that circular? On the Appropriations Committees, for a long time prior to 1964, we have been able to get those responses from the agency officials by asking them, "What did you request? What did the agency budget officer approve? What did you ask of the Budget Bureau?" They have answered those questions for a long time and it has been most helpful. So that wasn't the new element, I am sure. What is the new element?

Mr. STAATS. This point, as you indicate, has been in the picture a long time. I think what was involved was basically an effort to protect, you might say, the Presidential character of the budget to prevent volunteering information, in terms of lobbying for different amounts than those contained in the budget. This was the main thrust of it. Mr. McCandless may be able to add to that. I don't recall anything new in this except to spell out and elaborate on some of the questions that were raised.

Mr. McCANDLESS. I am not sure what change was made in this version in 1964.

Senator MUNDT. It would be helpful if you would provide for our record the circular that preceded the 1964 revision.

Mr. STAATS. Yes. We will identify the particular changes.

(The earlier 1954 circular and the explanation of changes made in 1964, in BOB Circular A-10, follow:)

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., April 15, 1954.

CIRCULAR No. A-10, REVISED

To: Heads of Executive Departments and Establishments.
Subject: Responsibilities with respect to the budget.

1. *Purpose.* This Circular brings up to date Budget Circular No. A-10, dated August 1, 1943, and restates for the guidance of the executive branch certain responsibilities with respect to the executive budget.

2. *Responsibility of the President.* The Budget and Accounting Act provides that there shall be presented to Congress for its consideration and action an executive budget for which the President is responsible. The budget represents the judgment of the President with respect to the financial requirements for all parts of the Government except the legislative branch and the judiciary.

3. *Restrictions on disclosure of agency estimates.* All budget estimates and supporting materials submitted to the Bureau of the Budget are privileged communications. Their confidential nature must be maintained, since they are the

basic data and worksheets in the process by which the President resolves budget problems and arrives at conclusions with respect to his recommendations to the Congress. The head of each agency is responsible for preventing disclosure of such information except on request in formal appropriation hearings and when requested by Members of the Congress in connection with their consideration of the budget after its transmittal.

4. *Restrictions on premature disclosure of Presidential recommendations.* The decisions of the President as to his budget recommendations and estimates are administratively confidential until made public through formal transmittal of the budget to the Congress. The head of each agency is responsible for preventing premature disclosure of such information. This rule does not apply, however, to the presentation of data on the President's budget to the Appropriations Committees, pursuant to arrangements made in specific instances by the Bureau of the Budget, in connection with formal hearings on the budget prior to the actual transmittal of the recommendations of the President.

5. *Agency letters and testimony on proposed appropriations.* The Budget and Accounting Act of 1921 provides in part that :

No estimate or request for an appropriation and no request for an increase in an item of any such estimate or request * * * shall be submitted to Congress or any committee thereof by any officer or employee of any department or establishment, unless at the request of either House of Congress. (31 U.S.C. 15)

The 1948 revision of Title 18 of the United States Code provides that :

No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation ; but this shall not prevent officers or employees of the United States or of its departments or agencies from communicating to Members of Congress on the request of any Member or to Congress, *through the proper official channels*, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business. (18 U.S.C. 1913, emphasis supplied. This section also provides penalties for its violation or attempted violation.)

In answering questions about appropriations and budgetary matters care must be taken to avoid conflict with the terms of the Acts mentioned above.

6. *Applicability to appropriation language and limitations.* The provisions of this Circular are applicable not only to the amount of each appropriation, but to the language of the appropriation estimate and to any limitations contained within it. If an agency desires to propose changes in appropriation language or limitations recommended by the President, such proposals are to be presented to the Bureau of the Budget for appropriate clearance.

7. *Reduction in estimates prior to enactment of appropriations.* Whenever it is found possible to reduce a request for appropriations before action thereon has been taken by either Appropriations Committee, the head of the agency concerned shall promptly inform the Bureau of the Budget.

8. *Reductions made in appropriation bills.* The final authority for appropriations rests with the Congress. Its action is based on extended hearings and recommendations by the Appropriations Committees and is taken only after consideration by each body as a whole. Any decision by an agency head to request restoration of a reduction should be carefully considered, taking into account the reasons for the reduction, the circumstances under which it was made, its significance from the standpoint of the President's program, and other factors which may be relevant.

9. *Control of expenditures.* The processing and implementation of the budget falls under the terms of the Budget and Accounting Act, 1921, as amended (31 U.S.C. 1-24), and of the Antideficiency Act (Section 3679 of the Revised Statutes, as amended). The requirements of these Acts should be familiar to all departmental and agency officials whose duties are related to budget preparation, submission, and implementation.

Particular attention is directed to the report of the House Committee on Appropriations on the General Appropriation Bill of 1951 (House Report 1797, 81st Congress) which contains the reenactment of the Antideficiency Act and indicates the intent of the Congress. This report states, in part :

Appropriation of a given amount for a particular activity constitutes only a ceiling upon the amount which should be expended for that activity. The administrative officials responsible for administration of an activity for which appropriation is made bear the final burden for rendering all necessary service with the smallest amount possible within the ceiling figure fixed by the Congress. Every official of the Government who has responsibility for administration of a program * * * [has] responsibility to so control and administer the activities under his jurisdiction as to expend as little as possible under the funds appropriated.

By direction of the President :

JOSEPH M. DODGE, *Director.*

EXPLANATION OF CHANGES MADE IN 1964 IN BUREAU OF THE BUDGET CIRCULAR A-10

The current version of Budget Circular A-10, dated January 18, 1964, revised a previous issue of the Circular dated April 15, 1954. The main substance of both these versions, namely, the President's responsibility by law for the presentation of an executive budget, and the responsibility of subordinates in the Executive Branch with respect to the President's budget recommendations, runs back to a Budget Circular, dated December 26, 1939 and brought up to date in the first version of Circular A-10, dated August 1, 1943. The substantive sections of the current version of Circular A-10 compare with the previous version as follows:

2. *Background and applicability of circular.*—The first paragraph of this section is unchanged. The second paragraph of this section is new to the Circular. It makes clear that, in addition to the budget documents, the Circular applies to budget amendments, supplemental estimates, and other proposals for granting new obligational authority which are transmitted to Congress after the original budget. It also makes clear that the Circular relates to estimates for the budget year and for the current year, but not to factual data pertaining to past fiscal years.

3. *Restrictions on disclosure of agency estimates.*—This section is exactly the same as section 3 of the previous version.

4. *Restrictions on premature disclosure of Presidential recommendations.*—This section remains unchanged in substance, although there are some clarifying word changes.

5. *References to supplemental appropriation requirements.*—This section is new to the Circular, and makes clear the extent to which a witness may appropriately discuss the possible need for a supplemental appropriation when a supplemental request is being considered, but has not been recommended by the President.

6. *Agency testimony and communications on budgetary matters.*—The first paragraph is the same in substance, and the quoted provisions of law are exactly the same as section 5 of the previous version. The final paragraph, setting forth policies to guide officials and employees when testifying before congressional committees or communicating with Members of Congress, is new to the Circular. However, for the most part, the Circular simply incorporates the substance of instructions which had been given to the head of each department and agency in a memorandum dated December 31, 1958 from Budget Director Stans.

7. *Clearance of changes in program under budget requests.*—The first two sentences of this section are substantially the same, respectively, as sections 6 and 7 of the previous version of Circular A-10. The third and fourth sentences are new. The third sentence requires that the Bureau of the Budget be informed of significant changes in program not involving a change in appropriation language or amounts, and provides that, after appropriate clearance, the matter should be placed before the Appropriations Committees. The fourth sentence makes it clear that the procedure set forth in the section applies to budget estimates not necessarily involving appropriations, such as budget statements under the Government Corporation Control Act.

8. *Reductions made in appropriation bills.*—This section is exactly the same as section 8 of the previous issuance.

9. *Control of expenditures.*—This section is the same as section 9 of the previous version.

Senator MUNDT. To pursue the matter a little further, when we interrogate the Corps of Engineers in the Appropriations Committee we are not limited to saying, "What did you ask for?" We say, "What are your capabilities?" We pin them right down to the grass roots. They themselves sometimes don't ask for their full capability.

This information we can get is very helpful. I would hate to see us retreat. The purpose of my question was whether this new bulletin was liberalizing the right of the agency to give us information or, to some extent, curtailing it. That is what I was trying to get at.

Mr. STAATS. In a sense you are asking for alternatives when you ask that question, in other words the capability in relationship to the budget request.

Senator MUNDT. I must say we have no complaint. We always get very fine responses from the Executive agencies. Some are not as good as others, but by and large, when we pin them down—when the subcommittee and the staff do their work and ask the questions—we get responsive answers. I can't remember ever being unable to get, as a member of the Appropriations Committee, what goes on at the other end of the avenue in terms of their requests.

But there may be something in the 1964 circular that we will explore, to see what the changes are.

Mr. WEITZEL. As a matter of history, with which Mr. Staats would be more familiar than I, it is my recollection that the legislative reference clearance in the Bureau of the Budget began at least partly in the early days of the Bureau at the request of the House Appropriations Committee, so that the integrity of the President's Budget would be preserved and that there would be a program of the President to be considered by the Congress.

Mr. Staats could check me on that.

INFORMATION ON COSTS OF ALTERNATIVE PROGRAMS

Mr. STAATS. I think we are getting at the broader question here of how does the Congress get all of the information that it needs in terms of alternative programs to accomplish a given objective.

When I was in the Bureau of the Budget, we stressed the importance of agencies developing five-year projections on all their legislation.

This responsibility, incidentally, was placed by Congress not on the Bureau of the Budget, but on the agency heads with Public Law 84-801. It is a matter which might be reconsidered by Congress in the light of the PPB, for example, which has a projection of five years or more built into it.

Information has been lacking with respect to honest judgment—not dishonest in a moral sense but in terms of objective judgment—as to what the total cost of programs would develop into.

Senator MUNDT. That is certainly very, very true. I think you get at one of the real problems with the sentence in your statement: "The problem of defining measurement criteria is especially complex when we seek to measure effectiveness of social programs." You are right in saying that we lack information as to the cost of alternative programs. We can get the information as to the speed with which a certain pro-

gram is being recommended, whether they are getting as much as the agency wants, or whether the Budget Bureau is cutting back or adding to the program. But information is lacking on the cost of alternative approaches to programs.

Take a case in point: everyone is concerned about inadequate housing in this country. So officials come to us with a program for public housing. We can ask the question as to how much the public housing authority requested, and so forth, and how much the Bureau of the Budget gave. But when we have before us four or five concepts of dealing with this housing program—and there are a lot of bills in the Congress, there are a lot of people who don't like public housing at all, but who want to create home ownership—when we ask what would be the alternative cost of this other approach, we can't get that information.

We ought to have that information to measure the validity of a public housing approach as against one which works with an insurance company to guarantee loans—they make a low interest rate loan to the would-be home owner, so he arrives at the end of the road owning his own home, and makes payments a little bit in excess of rent. There are a lot of bills that propose that approach, and it is for the same target. At the end, we have a fellow in the better house. The question is who owns the house, who owns the apartment or who owns the area that he lives in.

We can't get the alternative figures on the bills which strike at the same problem but use a different approach. I think what you are saying is we ought to be able to get that information some place. We can't generate it with our own staff.

One would have hoped that before the public housing officials make a request for X hundreds of millions of dollars, or billions of dollars, to meet a problem, they would have considered the alternatives in terms of cost. Is that correct?

Mr. STAATS. That is correct.

I do not believe Congress has taken full advantage of the kind of provision that was included in the highway legislation, for example, or even in the poverty legislation, of requiring, as of a given point in time, that certain information be developed for the Congress of an evaluative character.

Congress can specify the kind of evaluation it wants. The reason for putting it in the legislation is that this ties it to the continuance of the program.

Secondly, this approach gives the agency enough time to develop the information, as the PPB system calls for, as to performance. In other words, "How well have you done in relationship to what you told Congress you were going to do when you were here getting the authority in the first instance?" It is a tying back of performance against the expectations and promises or hopes, or whatever we want to call them.

Senator MUNDT. We passed a bill relatively recently, as I recall, that provides for a five-year review—a review at the end of every five years—of all the grant-in-aid programs. You were a witness before our committee to help work that out.

Mr. STAATS. Yes.

Senator MUNDT. That type of review might well be required in connection with other legislation. This wouldn't be a bad idea, Mr. Chairman, because we would then have this review as a basis for enacting further bills.

Relating one of the questions asked earlier by the Chairman to what I asked about housing, would it be within the purview of your authority in your shop, if Congress came to you and asked: "What are the relative costs of doing this job in the public housing program as presently established under the laws which prevail, as against the concept of working it around so that the man gets to own his own home?" And we could give you one of these bills and ask you to calculate the cost. Would that be a proper request to make of you, even before hearings were held?

Mr. STAATS. I am reasonably sure we could do it. The question would be one of time, how much lead time we would have.

In the case of the study on OEO, for example, we will have roughly one year to make that study, that is until our final report is made to the Congress.

I think the answer would be that if we had an adequate amount of lead time, we could be most helpful on something of this kind.

Senator MUNDT. It would certainly be very helpful at our end of the avenue.

LIMITATIONS OF PPB IN DETERMINING NATIONAL GOALS

You very rightfully pointed out earlier that in the PPB process we are really dealing with old wine in new bottles. The procedures and processes are not particularly new. In earlier periods of history we have moved in the direction of cost-benefit ratios, forward projections, and so forth, in making legislative decisions.

One of your sentences, to me, tells pretty much the whole story about the basic limitation of the whole PPB process: it really cannot determine national goals.

As you point out we have numerous goals in this country, but we don't have a single goal, one ultimate objective. As you say: "We have numerous goals such as security, progress, prosperity, freedom of choice, strengthening of the free enterprise system, and many other goals." And as you emphasize, we have this pluralistic concept of government, with its division of powers.

I can see how a PPB process, properly devised, in a totalitarian government, could crank out a lot of helpful results in terms of the degree of efficiency you can get under totalitarianism. But we have here, involved in the things you mentioned, the very ingredients of what makes America different from a totalitarian concept. You can do things, if you are going to ignore the private enterprise system, that you can't do if you are going to retain it.

The PPB analysis isn't going to really operate in terms of those various values. It is going to emphasize crass, materialistic efficiency, greatest results for the fewest dollars—providing all the bureaucrats would work as hard for the government as they would if they were working for themselves in private enterprise, which is a situation that never pertains in actual society.

I think that is the fault of the over-reliance on PPB, and marks its limitations. Once you have agreed among yourselves on a program and how it is to operate, then I can see how the PPB can come in to determine the best ways to carry it out—the best steps to take. But in the process of tossing up new programs and evaluating them, I think it ignores too much of what is basically America, and that is these different goals and values.

You very succinctly state that.

Mr. STAATS. The Congress and the President are dealing with many values which cannot be quantified. They can only be determined in the decision-making process of values, of political goals, and aspirations, in the best sense of these terms.

We have heard many debates, for example, on how much it is worth to preserve the family farm in terms of farm subsidies.

Senator MUNDT. That is a very good point. Theoretically, you could farm more efficiently if you had just one farmer in this country—one corporation doing it all. But this runs contrary to our great American concepts of farm ownership, of farm families.

Mr. STAATS. One value or benefit issue that we are concerned with in the review we are making of the poverty program is: "How much is it worth to bring elements in a community into the political process at the local level, elements that have never been in that process before, now a part of the community action programs, and which now will be related, we hope, to the local political machinery through the Green Amendment?"

How much is that worth? There is no way that I know of that we can quantify it. That doesn't mean to say that we shouldn't identify it as one of the goals of the program and attempt to appraise progress or effectiveness in achieving it.

What we are saying, I think, in our statement, is, "Let's don't make a fetish out of the effort to quantify," and conclude that that program which yields the highest benefit to cost ratio in a quantitative sense should be the one that necessarily should be adopted. I am not accusing all the people who are supporting the analytical approach of saying this.

Senator MUNDT. You have said in your statement that it is oversold, that it is oversold in areas where it ignores other human values.

Mr. STAATS. Here is an issue for January 1968 of the National Industrial Conference Board Record. Half the issue is devoted to articles under the heading of "The Systems Society". If you listen to some people, you would think we could solve all our problems with a combination of the computer and some of the newer techniques of management and program analysis.

Senator MUNDT. This whole debate is breaking out in a new area, now. It came to my mind when you raised the question, and I am not too sure what the implications of your question were: "What criterion will permit us to choose between saving one human life and preventing a large number of cases of blindness?"

Just recently I sat on a committee where a very distinguished foreigner, Dr. Christiaan Barnard, testified about heart transplants and his philosophy about it. At least one member of the committee hearing the testimony seemed to lean in the direction of saying: 'Aha; here

is something we can subject to some kind of a PPB analysis. Here is something on which we should set up boards and commissions to determine whose hearts to transplant, when to transplant them, how to do it with the greatest efficiency, how to do it with the least cost.'

Dr. Barnard said in effect: 'You lose me entirely. This is a relationship between the doctor and the patient, much like a blood transfusion.'

It would seem to me that in this area a PPB machine would be completely useless, because you have so many personal and human elements. A man knowing he is going to die with a bad heart might be perfectly willing to sign a letter authorizing the doctor to transplant his heart on death, provided he is transplanting it to his friend and neighbor beside him, Mr. Jones, who has always looked after the kids when he was gone, and has been a wonderful neighbor, instead of the neighbor to the south, Mr. Smith, who breaks into his house every time he leaves town. So here the PPB mechanism wouldn't work very well. You have the human elements.

I am so happy you brought this in, because we are not just a crass, materialistic society, responding to push buttons. We are human beings, with different ideas, different motivations. Our whole society and the American dream are built on that concept.

I think you come out with a pretty sterile society if you just look at the cost element, the cost factor, and try to decide things on this basis.

A great many comments could be stimulated by your paper, and I would like to ask many questions. I will limit myself now, however, to making one more comment, and then yield back to the Chairman.

THE M-16

I am wondering, Mr. Chairman, and you are a better authority on this than I am, about the big flap that developed over the M-16 when it stuck, when it would not work very well, and people said, "You have made a hideous mistake"—which has been pretty well corrected now.

As I understand it, the flap developed from the fact that after we got the new rifle and found we had a lot of cartridges that wouldn't fit into the rifle, and we had a lot of powder that hadn't been used from another war, we would put the powder in these bullets, and save a lot of money, which was a perfect example of how a cost analysis system would save a lot of money. There was only one thing, that something in the powder was too sticky and it clogged up the rifle, until they got a new rifle cleaning system. Many lives were lost, of course.

But here is a case where a cost analysis system could go wrong, whereas, perhaps, cranking in a lot more human elements, we should have said, "Perhaps these rifles would be all right, but let's try them on the firing range at home with this old powder and see how they work."

I commend the effort to save the money, but I call attention to the fact that just a systems analysis and a cost-effectiveness approach to a problem isn't always sound. Thank you.

QUALIFICATIONS AND ROLE OF SYSTEMS ANALYSIS STAFFS

Senator JACKSON. I would like to follow up on the colloquy that Senator Mundt has engaged in, on a point that I think is important.

It seems to me that proven competence in the substantive and institutional aspects of issues up for decision would be the first requirement of a systems or policy analysis staff—whether the staff is in an Executive Department or in the GAO. Yet, as you know, the PPB process tends to attract into its systems analysis staffs, people whose background and training are in the formal analytical approach, such as economists, engineers, and mathematicians. These people may be trained in the techniques of computers, statistics, and mathematics, but how many of them have shown evidence of proven wisdom or judgment in the field of endeavor in which the decisions are to be made?

I would appreciate having your view of this problem, Mr. Staats, especially with reference to your own experience in the past in problems of staffing in the Executive Branch, and now in the GAO.

Mr. STAATS. Instead of answering that directly, I would like to go back to what seems to me to be a pretty fundamental point, which has been overlooked to some degree in these hearings, at least as I have read the hearings.

That is, that the President in formulating his budget, has to start out by looking at the budget as a part of his fiscal policy program, his legislative program, and, if you will, his political program.

After all, the President is a representative of a party, and he is interested in having his budget reflect the kind of program that his party endorsed at the time he was elected. He is also interested in the question of taxes. He is interested in the question of whether the economy is functioning at its highest feasible rate.

He must, therefore, look at the budget in modern times, at least, as a part of this overall picture.

So in formulating his plans, he has to come to a point of judgment on these broader questions. Does he want to go for a tax increase next year? Does he want to have a debt level of a certain magnitude? What are the economic consequences of his decisions on the overall budget?

The preview, which I described, which we developed a number of years ago, was designed to bring up program and policy issues in the early stage of the budget formulation, including the major issues bearing on the level of individual programs, further analysis required, longer term budget costs, and fiscal policy implications.

The early preview involved consultations with the Secretary of the Treasury, the Council of Economic Advisers, and his Cabinet. The President then provided the Budget Director his general objective as to budget levels. It never was fixed as to a precise figure.

The Budget Director had then the basis for telling each department or agency what that total would translate itself into, given fixed commitments that the department had to meet in terms of the things that were required by law—say, veterans' pensions, social security payments, things of this kind. He was able to fix a target figure.

This accomplished the objective of giving the agency head an overall benchmark that he could work against in his planning.

It did not prevent him from coming in with a higher request, if he wanted to put in a higher request. The purpose, however, was to include in amounts above the target figure, those programs of lower priority, desirable perhaps but not as essential as those within the target figure.

In other words, if he had to budget within that target figure—if the ultimate decision was to hold to that target figure—he would presumably include those programs of highest priority in the budget submission.

The reason I believe this point is relevant to your question, Mr. Chairman, is that the purpose of that system was to put the responsibility on the agency heads who were charged by the President and the Congress with formulating and carrying out programs to achieve objectives approved by the Congress.

These agency heads are appointed by the President and usually confirmed by the Senate. In many cases, they are charged directly by law, by the Congress, with carrying out these programs.

I think this is also relevant to your question because the basic thrust of all this is to say that it is the political head and his subordinates who should have the primary responsibility with respect to priorities that are submitted to the President for his consideration in preparing the budget.

This doesn't preclude him—or the President—from having the systems analyst help him analyze the total costs, help him analyze the interrelationships that exist in some of these complex programs, particularly in the scientific and technical fields, and assist him in weighing alternatives, and recommending priorities.

This procedure places the emphasis on the point which I think is important; namely, that the people who are responsible for making political judgments and administrative judgments, and who have the responsibility back to the President and the Congress, must play the primary role in establishing priorities to carry out national objectives.

The emphasis has shifted somewhat in some of the recent discussions on PPB, away from this basic point to one of comparative costs and benefits as being the primary test.

RISKS IN PPB SYSTEM

Senator JACKSON. Mr. Staats, the thing that bothers me is that the Executive in a big agency, as you mentioned, is a very busy man. In the decision-making process he must rely to a certain extent on the judgment of others. It seems to me that there is the danger that when some of these alternative proposals come up to him, he may not be fully aware of all of the premises and factors that have been cranked in in making the analysis. In this business, if the man running the analysis is brilliant in his own particular discipline, whether it is mathematics, economics, or something else, but lacks that undefinable quality called "judgment," the boss may get snowed and really not be in a position to question fully what should be questioned.

Everyone wants the expert-generalist all-in-one, you know. But this sort of composite man is not always available.

I am worried about the danger that is inherent in a system in which so much reliance could be placed in these analysts, who have not had that broad, generalist experience, and, who, therefore, fail to take into consideration sufficient alternatives and may wholly misjudge the human, diplomatic and political consequences of their proposals.

The political appointee, as you mentioned, is a busy man. He may not have the time or the opportunity to dig into the premises, cost data, and other information that went into the alternatives that are put before him.

Are we developing here a group of experts that are limited experts, and who have an unwarranted impact in the decision-making process?

Mr. STAATS. I think we are dealing in part with the danger which has been created, somewhat, by the terminology, itself, if I may say so, by calling this a "system."

All I can say is it isn't a system in the sense that you or I would normally describe a system. It is a system only in that it is an effort made to package or interrelate several elements which have been present in budget making for some time.

One, to make long-term plans, or plans that are as long term as can foreseeably and desirably be made.

Second, to identify programs which are going to be effective in carrying out objectives as against looking at the budget in organizational terms or in terms of component costs such as salaries, travel, etc.

And third, to embrace both in the form of a budget presentation.

I would like to see us get away from PPBS as the title to describe this process. It connotes a system in the sense that we are attempting to formulate programs or legislative recommendations separate and apart from the stream of management and from the political decision-making process.

I think this is where it has gotten a little out of focus.

Senator JACKSON. There is a danger that the "system" might become an end in itself. In other words, the assumption might be made that "this is where the answers lie."

I am concerned about the development here of a cult in the governmental decision-making process that, through quantitative analysis and so-called scientific means, attempts from time to time to be a substitute for nothing more nor less than judgment.

It is true that we do have a need for good systems analysis on some problems involved in the policy process, but it is not a substitute for judgment. This is what I am concerned about.

Mr. STAATS. That is right. I feel that the systems analyst, the computer, and all that is usually associated with systems or program analysis plays a very important part, particularly as programs have become more complex—

Senator JACKSON. I agree on that, but it is of first importance that these techniques be guided by good judgment.

Mr. STAATS (continuing). They have to play a part, and a very important part.

POSSIBILITIES IN PPB PROCESS

I would also like to say this:

First, in my own experience in the Budget Bureau, I did not feel that we always had enough analysis of the alternatives. We were usually in a tight time squeeze to get the budget out. We didn't always

have a chance to go back and ask for a new analysis or a statement of alternatives. Fortunately, we had a good staff that could do a lot of this for us. There needs to be more attention given to alternatives, both at the Presidential level and particularly at the Congressional level. That goes back to our earlier discussion.

Second, I think there ought to be more observance of the policy that has already been established in the Congress, in having better projections as to future costs of programs and program proposals. I am including here total cost, not just Federal cost. If this involves State and local costs, it should include them, for example.

Senator JACKSON. It seems to me in this area there could really be no dispute. We can never do the job of getting cost information too well.

Mr. STAATS. The third point, also involved in PPB, which I think is desirable, is to have more Government-wide information with respect to programs, where a number of departments are engaged in the same or closely related programs.

If Congress is considering an expansion or modification of a program with respect to one agency, then it would have better knowledge of the implications for its action on the related programs of other agencies.

Take manpower training, for example, or take many of the areas of research and development, which cut across agency lines. Better program definitions would help in terms of improving the special analyses which are now in the budget.

I personally think that special analyses are among the most useful things in the whole budget document, if one is interested in Government-wide programs.

Another example is the national resources program. Agriculture, Interior, HEW, and other agencies are involved. The knowledge as to what the total effort is among all these agencies in a given field is important.

Program categories, if they are properly defined, should enable us, over a period of time, to have much more useful information of this kind than we have had in the past.

PPB AND ADMINISTRATIVE REFORMS

Senator MUNDT. There is an area where it seems to me PPB could render a great service; namely, the multiplicity of agencies and departments working on the same kind of problem.

For example, we started the exchange-of-persons program under a single law, Public Law 402 of the 80th Congress. One agency was to have charge of the exchange-of-peoples program—in 1953, it was put under the USIA. The idea of exchange-of-peoples caught on. In 1960 the President thought this was a splendid idea, so instead of handling it through a single agency, as they originally did, we now have almost every department of Government running its own exchange-of-peoples program—cultural exchanges, exchange of ideas, conducting tours—and sometimes foreigners wanting to visit this country, if they are prudent, don't take the first offer they get. Perhaps they can make a better deal with the Department of Agriculture than they can with the Department of State. If they are in the military, they can make even a better arrangement.

It seems to me that a real cost-analysis system should figure out that there shouldn't be all those cooks making the same broth. There ought to be somebody in charge of the exchange-of-peoples program, who certainly could help eliminate the competition for the best arrangements.

I think PPB has a real function to perform in this general area. But I can't see any results now flowing in that area. We seem to continue to proliferate exchange programs. PPB became operative in 1965. In the last two years, I don't see any change in the direction of reduced proliferation in these exchange programs. It seems to me we continue to pass new bills, create new authorities, and give more money to different agencies. One sits in the Appropriations Committees, and time after time after time one votes exchange-of-peoples money for different agencies—not to mention antipollution money for different agencies.

Mr. STAATS. I would like to say this, though: As I indicated in my statement, going back to the 1940's, I believe to 1948, we developed a functional classification in the budget such as agriculture and natural resources, and health and welfare. It presents a definitional problem as to what each of these functions embraces.

This early effort was an attempt to bring together, separate from organizational lines, the total Government program in broad functional categories.

There were 10, when we started, and I believe there are 12 now. These are functional categories.

That data needs further refinement, and part of the responsibility we have in the GAO is to improve the accounting systems to make that refinement possible. More special analyses are needed.

I believe that information is going to be available separate and apart from PPB. PPB may help to do the analysis as to why a program should go in one department and not in another—in other words, which is the most useful place for it to be carried out, so the location is based on analysis, rather than the wishes of a particular agency or the interest of a particular committee of Congress.

Senator MUNDT. PPB ought to be able to come up, I would think, with a uniform set of criteria as to how the taxpayers' money should be used to help finance foreign exchange-of-persons programs, so there would be uniformity in treatment, and the terms of the exchanges would not become competitive among a number of agencies of government.

You have the same kind of problem internally, with the dickering that goes on for the best available arrangements for help from FHA, or HEW, and so forth, on some domestic projects.

Mr. STAATS. Wouldn't you agree, though, that that is, in part, an organizational problem? If we could organize all of these programs on strictly functional lines, we would avoid a great deal of that.

Senator MUNDT. This should be part of the job. But some place in programming, planning, or budgeting, you ought to come up with criteria to cover the waterfront.

In your statement, you suggest three essential purposes of PPB.

I am not so sure that PPB is going to function very well in defining national goals and identifying those considered most urgent. That is really for political decision, by the Executive in conjunction with the Congress—the Executive proposing, Congress modifying, and so forth.

After that is done, the determination of alternative ways of attaining these goals and the probable costs, seems to fit pretty neatly into what I conceive to be an appropriate job for PPB.

The third purpose, as you stated it, is "to improve performance by attaining the best possible program returns for each dollar spent." It seems to me that that is the place that PPB ought to be right up in the front lines.

Frankly, I am not so sure of the function of PPB in terms of defining national goals. There you put an over-emphasis, sometimes, on cost, efficiency, and administration in violation of the concepts of free choice, private initiative, individual ownership—which are inherently basic and fundamental to the American system.

I don't think all three of those functions are equally appropriate to be handled by the system.

Would you agree or disagree?

THE PROBLEM OF NATIONAL PRIORITIES

Mr. STAATS. I think generally I am agreeing with your point.

I would say this, though, in respect to my own experience in the budget area, that the most difficult problem wasn't one of getting information on what we were spending in all the different agencies with respect to a given type of program.

The much more difficult problem was how to decide as among different programs—within a relatively fixed total amount you are working against for the budget as a whole—where we should expand, and where we should contract.

In other words, should we contract in Agriculture and go up in HEW? How do you evaluate these trade-offs? Research is a case in point.

For example, former Secretary Hitch in a recent speech answered when asked, "How do you decide on the costs and benefits of basic research," said in effect "We determine it on a level of effort basis."

Senator MUNDT. When you start out with a budget, do you begin by figuring out, in terms of needs and national objectives, what each division and function of Government is going to get? Or do you start out by having in mind the total amount that you think you can spend to protect the economy in terms of the anticipated revenue, and then ask the agencies and departments to give you a priority list?

Which way do you start? Do you start trying to meet the needs, then look at the figure, and then try to cut back after that? Or do you start out with an overall figure and insist on a priority list?

Mr. STAATS. I will speak of the approach just prior to PPB, because of the changing situation over the past 20 years.

We had meetings with the Cabinet officers and agency heads on an agenda of issues and questions. This took place early in the year, sometimes as early as February. And in these meetings, we tried to identify for the following year's budget, which was due in the Bureau of the Budget in September, areas where staff work was to be done, the problem areas, and the things we ought to be concerned with at that time, if we are going to be able to have the necessary control over and information needed with respect to the following year's budget. The Cabinet officers and the agency heads participated directly

in these discussions. The results of these discussions were communicated to the President.

We were working at that point of time within——

Senator MUNDT. At that stage, what guidelines did he have? Did he have a monetary guideline, saying, "It looks as if your share of the budget will be X dollars"?

Mr. STAATS. The President had before him an analysis prepared by the Bureau of the Budget, the Council of Economic Advisers, Treasury, with some input from Commerce and the Federal Reserve Board, as to what we could then project by way of growth of revenues under existing taxes, and the growth of certain programs which were fixed by law, and which would change in accordance with law or in workload, unless the law was changed.

In other words, we had a preliminary analysis to place before him. Against that, he made a tentative judgment with respect to what we should be working against by major program areas in terms of a total for the following year.

Senator MUNDT. When you sat down with Stewart Udall, you said, "Look, we have about so much money you are going to have." At the very beginning, he knew that. He had to establish a priority list?

Mr. STAATS. We didn't tell him that, at the first meeting, but we did tell him that when we reached the point where we wrote him a letter in which we specified the issues that we would be concerned about for his next year's budget, and the amount of money which he should work against for purposes of his establishing priorities.

The point of this was to get him to fix his priorities within a specified amount. He was told that he could go above that amount, if he felt that he could not live within the total, but he was supposed to put the highest priority programs within the target figure.

Senator MUNDT. How much detail would you give him in that? Would you give it to him as a department-wide figure, or would you give it to him broken down with so much for the Indian Bureau and so on?

Mr. STAATS. We gave it to him on a department-wide basis with the understanding that he could determine the priorities.

Senator MUNDT. Did you ever see his priority list?

Mr. STAATS. The internal list that he developed?

Senator MUNDT. The priority list, so that you have a look at what he considers, with all the activities for which he is responsible, the order of priorities, showing what is the least important, and what is the most important?

Mr. STAATS. I am not sure that we saw all of it.

Senator MUNDT. Isn't it a valuable disciplinary function to make them establish a priority list?

Mr. STAATS. Yes.

Senator MUNDT. Let me give you one illustration.

We have wrestled with this AID program in the Foreign Relations Committee for a long, long time, and we never could get a priority list from AID giving the order in which they would set forth the countries to which we give aid.

In the last year or so, we developed our own device. We said, "All right, you can give it to only 50 countries. You can't go beyond that. You have to establish some kind of 50 priority list, because the 51st country will not get it." Now we have the list cut down to 40.

I think it is useful to make them establish some kind of a priority list in their own shop.

Mr. STAATS. Mr. McCandless has called to my attention that one of the requirements we had in letters to agency heads giving them instructions in April or May 1965 for the preview of the 1967 budget, was a special priority analysis of the program plans in two parts.

Part one of the analysis would set forth the programs and activities which in the agency's judgment were of relatively lower priority than the others in the agency's total program proposed in the 1966 budget. The number of such activities would be large enough to represent about 10 to 20 percent of the total obligations budgeted for the agency, say, in the 1966 budget.

Part two of the analysis dealt with the relative priority of program increases from the 1966 budget which were proposed for the 1967 budget in the agency.

What we were after was to force the agency head, if you will, to make these tough judgments within the framework of his responsibilities for his Department.

Senator MUNDT. I think it is very good and very important, and one system we should consider as we try to economize.

Mr. STAATS. He would still come back, not surprisingly, with a figure higher than the target figure. We more or less expected that to be done.

In part, this happened because usually the agency would argue that they ought to have a larger share of the total budget on grounds of national priorities of their particular programs against all the competing programs.

This was the toughest part, in my own experience, of the whole budget problem. How do you make these judgments among programs, which are completely unlike each other as to purpose or objective?

We weren't deciding upon programs to accomplish a particular objective. We were trying to decide which objective we wanted to emphasize. PPB does not really get at this problem.

Those are the real tough issues, and those are the ones that this approach was designed to try to achieve in terms of broad program priorities within the big departments and agencies, but it still didn't give us the answer as to how much ought to be done for veterans in one year, and how much ought to be done for the people on public assistance, or how much should be spent on water research, or for medical research.

COST OF PPB SYSTEM ITSELF

Senator MUNDT. In your shop, do you identify the cost of the PPB system itself? We asked a key Budget Bureau official how many people were involved in the PPB process and he did not know the correct answer and had to give it to us at a later time.

PPB doesn't come cheap. It doesn't come free. We are spending some money in this business.

I wondered whether over at the GAO you ever had any occasion to estimate the amount of public funds being spent on the PPB.

Mr. STAATS. Before you came in, we did indicate that we had undertaken a study of the PPB system, itself, including the administration of the system. This will be one of the things we will be interested in looking at.

Senator MUNDT. You don't have the figures yet?

Mr. STAATS. No.

Senator MUNDT. Do you think anybody yet knows the figures? Do you think anybody outside of your shop, at the other end of the avenue, knows the figures?

Mr. STAATS. I haven't seen any figure, other than those individuals who were identified during Mr. Schultze's testimony to this committee, who are in special units in the agencies for the purpose of making these analyses. I think this figure is something like 870.

Senator MUNDT. Wouldn't you agree that that is one factor that we ought to know as we consider in Congress whether or not this system is developing efficiency, or squandering funds? We at least have to know what it costs.

When a Budget Bureau official cannot tell us how many people are involved in PPB, it makes us look at the system with some skepticism.

Mr. STAATS. I hope we will be able to give you some detail on this when we complete our report.

Senator MUNDT. It will be most helpful.

THE PITFALL OF JARGON

Senator JACKSON. Now, on the lighter side, a PPB draft guide for the preparation of special analytical studies—recently circulated within the AEC by the Office of the AEC General Manager for program analysis—contains the following paragraph:

The concept of a parallel internal list of topics in addition to those which are specifically identified for near-term submission to the BOB recognizes an Agency need or interest for initiation of study activity in areas in which it is not clear prior to completion that discussion with BOB will be warranted, or which may represent possible early phase of more formal studies later or which may require an extended period for completion.

Mr. Staats, if you received an instruction of this sort, what would be your reaction?

Mr. STAATS. I suppose I would have to go back to the source and find out what the writer had in mind. It seems more like an assembly of words rather than a statement of any substance.

Senator JACKSON. It certainly goes to show that one can get lost in one's own handiwork.

Dr. Tufts suggests that possibly the language I have quoted to you was written by a computer.

In this connection, I would like to place in the record the reaction of Admiral H. G. Rickover to the AEC instruction from which I have just quoted. The Admiral's reply was reprinted in a recent issue of the atomic energy newsletter *Nucleonics Week*.

Mr. STAATS. I am sure Admiral Rickover, being much more articulate than I, would do a better job of replying than I.

(The reprint referred to follows:)

YOURS FOR MINIMIZED OBFUSCATION, H. G. RICKOVER

This will acknowledge receipt of your memorandum and attachment dated Jan. 26, 1968, requesting my review and comments on your Guide for the Preparation of Special Analytical Studies. I have spent much time reading this document; unfortunately, I cannot understand it. Its statements on how to conduct Special Analytical Studies sound extremely impressive—these statements include many large and unusual words in complex syntax and obviously are the work of

an intellectual. However, many such statements are beyond my comprehension; for example:

"The concept of a parallel internal list of topics in addition to those which are specifically identified for near-term submission to the BOB recognizes an Agency need or interest for initiation of study activity in areas in which it is not clear prior to completion that discussion with BOB will be warranted, or which may represent possible early phase of more formal studies later or which may require an extended period for completion."

As you know, my training is in engineering and not in analysis and is thus deficient to enable me to understand your Guide. I asked several of my leading engineers and scientists to help me, but they also found your Guide beyond their comprehension. My conclusion is that we in Naval Reactors are not sufficiently sophisticated to understand it; in order to ascertain if your Guide has any practical use, it would first have to be rewritten in simple English, that is in language we "plumbers" in Naval Reactors could understand.

On Aug. 23, 1967, before the Senate Subcommittee on National Security & International Operations of the Committee on Government Operations, Mr. Schultze, director of the Bureau of the Budget, stated that "the whole procedure (for analytical studies) is set up to generate counter-analysis by other advocates" (or adversaries). To do this, he said, "Admittedly, an agency is dependent primarily upon its own analytical staff." Because your Guide is beyond my comprehension, I considered referring it to my "analytical staff" for appropriate analysis and simplification. Unfortunately, my "analytical staff" is presently engaged in preparing several "counteranalyses" to analyses prepared by the Dept. of Defense concerning application of nuclear propulsion to surface naval warships. In addition, someday I would like to have my "analytical staff" available to perform some technical work for the Naval Reactors program—if I am not forced to continue to study and report on these more esoteric matters.

Accordingly, I have deposited your Guide in my special file. When and if you rewrite it in a form I am able to understand and when and if my "analytical staff" finishes his present "analytical counteranalyses", does some of his technical work and has the time to analyze your Guide, I will provide you my comments, if any.

Senator JACKSON. I have a few more questions on which I would welcome your comments. In order to save the time of the committee, I will submit them in writing, and you can provide your responses subsequently to be included at the end of this hearing record.

Dr. Tufts has some questions, and Dr. Farber, too.

PF&B AND FOREIGN AFFAIRS

Dr. TUFTS. I would like to refer back to the discussion that Senator Mundt initiated a while ago.

As you may recall, last year Vice President Humphrey challenged scientists and engineers "to become more involved in solving our problems here on earth * * * to make our society a better place to live." One response to this challenge was a forum held last week by the American Institute of Aeronautics and Astronautics and the Operations Research Society of America on the subject "Systems Analysis and Social Change."

One of the participants, Joseph H. Engel, the incoming president of the Operations Research Society, was quoted by the New York Times, as follows: "As we move closer and closer to human beings, human life, and to its goals, we find that we are dealing progressively with more and more difficult problems."

At another point, he remarked, referring to scientists and engineers with experience in designing weapons systems: "We're very good at hardware and tactical problems and starting well-defined research and development programs. We're lousy at strategic and philosophical problems."

It seems to me when we move from problems of Defense to, say, problems of foreign affairs more generally—the problems that AID, USIA, and so on, are concerned with—that we are more and more likely to encounter the kinds of difficulties that Mr. Engel has in mind. He is, of course, referring to domestic, social problems, but I think foreign affairs problems have the same characteristic of being more complex and, in a sense, closer to human beings.

I wonder if you care to comment on that view. Where are we going to find the people who are capable of strategic and philosophical approaches?

Mr. STAATS. I have two or three reactions.

It seems to me as you move away from those things which can be quantified into the kinds of questions that are implied here, and in some of the other questions we have discussed here this morning, you must necessarily move more and more to consideration of questions of the kind of organizations which facilitate good decision-making.

I think it places a heavy premium on the process by which we reach decisions, whether they be task forces, or whether they be better use of consultants, or obtaining advice from people from the private sector, who can assist in reaching conclusions. This is the case particularly in the foreign affairs field, which is so all-embracing now in terms of agencies and programs, including, even, the effect overseas of what we do domestically.

It places a tremendous premium on the process by which the Secretary of State carries out his responsibilities, both as advisor to the President and as the administrator of a large department. I think very frequently we lose sight of the fact that the Secretary of State wears both of these hats.

This calls to mind a question that Dr. Schelling raised. I think there are some questions that he did not cover in his statement with respect to the role of officials of the Department of State in carrying out their responsibilities as advisors to the President, particularly in the foreign affairs field.

This is an extremely difficult problem. One of the experiences that we had in the Bureau of the Budget, and I am sure it is still the case, was to get the State Department to become interested and to express a judgment with respect to the foreign affairs programs of other agencies, such as Agriculture, Labor, HEW, or any one of the other agencies.

This resulted partly from fear of controversy, particularly because those agencies have their own committees of the Congress, their own subcommittees of the Appropriations Committees. I think, very frankly, that those agencies were stronger in terms of being able to get programs and money than the Department of State was. I am confident this was the case.

We tried many, many times to get the Department of State to review the foreign affairs programs of these other agencies and give the Bureau of the Budget a judgment with respect to whether those programs should be undertaken, and, if so, at what level.

We found extreme reluctance to do this, even with respect to our contributions to international organizations. The Department of State has been very reluctant to get involved in the question of the FAO budget, for example, or the budget of the World Health Organization.

How can you strengthen the role of the Department of State if we have this reluctance on the part of the department to get involved in these other programs? That was the central question that we were concerned with.

We did receive, informally, suggestions from time to time that the Bureau of the Budget should get all of the agencies concerned together on a country-by-country basis, in terms of reviewing the next year's budget. Our concern was that we would weaken the Department of State still further if we did that; that we would, in a sense, be taking the responsibility out of their hands.

We may have been wrong in that judgment. There is a great deal to be said for country-by-country budgeting, insofar as the total U.S. effort in that country is concerned, taking into account all of the various U.S. programs which might influence the program and policy of other countries.

The second point I would make is that both President Eisenhower and President Kennedy issued very strong directives with respect to the role of the ambassador. I don't know how you could describe the responsibility more clearly than was done in those two directives.

Yet, again, there has been extreme reluctance on the part of the ambassador to, in effect, become the boss in that country with respect to U.S. programs.

Senator MUNDT. It varies by ambassador. One ambassador might be in charge of the country team, and in other cases he might be interested in doing just the diplomatic work.

Mr. STAATS. That is right, depending upon who has the interest, or you might even go further and say who has the capability. They are usually not selected on the basis of being able to perform that kind of a function.

Third is a question of country programming, aside from the budget, at the Washington level.

There have been many efforts to develop in the Department a Foreign Affairs Programming System. A Budget circular on this was started at my own initiative while I was in the Budget Bureau. This was five or six years ago.

An effective role for the Department of State in coordinating policy and operations of all of the Federal agencies has not been accomplished for a variety of reasons: some pertaining to the internal organization of the Department itself—that is, the lack of effective interagency coordinating machinery; in part, because of the preoccupation in the Department with “policy” in contrast to “operations”; and, in part, because of opposition in other agencies of the Government.

Despite a number of efforts, this situation presents a continuing serious problem in the effectiveness in which we develop and carry out foreign affairs programs.

As I believe you know, I was associated for five years with the National Security Council as Executive Director of the Operations Coordinating Board, a Board established in the early part of the Eisenhower Administration to effect greater coordination in the development of programs to carry out foreign policy objectives. While many mistakes were made, I also believe that much was learned and very considerable progress was achieved in effecting improved relationships among the agencies, in deciding upon allocations of responsibilities,

and—perhaps most importantly—in the development of country programs. For example, one result was that the USIA, the Office of International Security Affairs of the Defense Department, and CIA for the first time organized on a country and regional basis in accord with the regional groupings of the State Department.

The termination of the OCB in the early part of President Kennedy's Administration was an attempt to provide more flexible coordinating arrangements and to again focus primary responsibility on the Department of State to achieve governmentwide coordination of foreign operations. Recently there has been established the Senior Interdepartmental Group, chaired by the Under Secretary of State, to accomplish in large part the same purposes as the OCB. My impression is that this group has been relatively inactive, and again points up the difficulties which have been faced in the past by the Department in carrying out this overall role.

NEW TECHNIQUES FOR CONGRESS?

Dr. TURTS. You have been talking about the problems within the Executive Branch. I would like now to come back to the point we have touched on several times this morning, and that is, how the Congress can better equip itself to help it in its needs when facing these problems.

The Chairman pointed out that agency heads in the Executive Branch are very busy men, and must rely on staff. If I may say so, Members of Congress are second to none in terms of the demands on their time. If they are to make the kind of cross-examination of witnesses from the Executive Branch that the Chairman has referred to, they need to be well informed. As we all know, the skillful lawyer's ability to cross-examine depends on his intimate knowledge of the case.

My question, and I think it has come up in one form or another several times this morning, is: How is Congress going to get the information which will enable it to cross-examine the representatives of the Executive Branch? Where can Congress look for that kind of help?

I wonder if Congress is going to have to look to its own committee staffs, primarily, or whether it will have to create a new organization for the purpose, or whether perhaps the GAO, itself, can move more in this direction of providing information before legislation is taken up, rather than providing us with information afterwards about how well the program has been carried out, and so forth.

Mr. STAATS. I doubt if there is a single answer to your question, as to how this capability can be strengthened.

I would suggest at least three ways in which it might be strengthened.

One would be the staff of the committees. This varies from committee to committee, as you know, in terms of the background and numbers, but there is frequently the possibility that funds are available to bring in people on a consultant basis. Many times this does not involve any more than travel costs. Such staff or consultants could help formulate issues and questions. Many people are willing to do this without very much cost to the Government.

Secondly, I would suggest that there needs to be more effort to identify program issues at an earlier point of time instead of waiting for a hearing. In other words, Congress could anticipate for a year in advance, or six months in advance, some longer span of time, in which it could specify the kind of evaluation that it wants the agencies themselves to develop. I think it is a little late, when you get to the committee hearings, to be able to get very much that is useful with respect to new questions or issues unless it happens to fit in with something that has already been done in the agency, itself.

Thirdly, I would hope that we in the GAO, over a period of time, would be able to be more useful in this area. I think we have to develop this capability further ourselves.

Obviously, we are not going to try to "sell" the committees on our role in this area. We are interested in improved communication with the committees. We are interested in responding to the extent of our capability in numbers and kinds of staff, in this area, as in any other.

I would be fairly optimistic that over a period of time we would be able to do a great deal more in the area of cost-effectiveness.

We have established, as I indicated, a small systems analysis staff. This will be made up mainly of our own people, who will receive special training. There will be a few from the outside. Added to these, we are giving training to our other audit staff to improve their capability in these fields.

We have had over 200 staff members who have already been through at least some brief training in systems analysis. This was through a contract we had with the Stanford Research Institute. We want to step this up to lengthen the program, and so on.

It seems to me that the greatest need that I can identify for our capability would be in those—limiting this to the question of the area of PPB—areas that are really complicated and major systems or major programs, like the supersonic transport, or like the Sentinel program, or any of the other large programs which represent major decision points, which represent commitments not only with respect to dollars for a long period of time, but commitments with respect to national security, transportation, or whatever it may be.

In other words, what I am suggesting is that it be done on a selective basis, rather than saying that we should try to do this on an across-the-board basis in every program.

GAO STAFF CAPABILITIES

Dr. TUFTS. I was thinking, as you spoke, that I really know very little about the GAO and the staff capabilities that you have. I would suppose that because of the historical responsibilities of the agency, your staff would become weighted with people who are expert in auditing and accounting.

Do you have, or do you feel you can get, the kind of people who can ask the sort of questions about strategy—valid questions—that really get at the basic issues involved in the programs that you are asked to review?

Mr. STAATS. I believe we are developing increased capability to perform the type of reviews to which you are referring. As you know, most of our professional staff in the accounting and auditing area have

their academic training in the field of accounting and auditing, although many have had extensive work in economics, business administration, statistics, and other pertinent fields.

Then, too, the experience which a staff member receives in the GAO is valuable. Many of his assignments are quite broad and deal with both program and management problems. They also provide experience in dealing with problems of a large number of agencies. The breadth and variety of this experience provides a good foundation on which to build other capability.

This type of experience, together with the training programs which we have undertaken, cause me to be optimistic as to our longer-term capability. Also, we are adding a limited number of specialists in other fields of management and program analysis, and will be strengthening our training program with particular reference to the kind of analyses which we have been discussing here today.

SHORTAGE OF TRAINED PPB PERSONNEL

Dr. FARBER. Kenneth Mulligan, of the U.S. Civil Service Commission, has estimated that we are short over 10,000 people in the administrative-analysis area.

Has the lack of trained personnel been a considerable handicap in the application of the PPB system? Has the system suffered because of personnel shortages?

Mr. STAATS. There is a shortage on a Government-wide basis of the kinds of people who have been identified in the Budget Bureau Circular for work on PPB.

The emphasis in that initial effort, at least, was on economics, engineering, and mathematics, in other words, in the quantitative skills and backgrounds.

In the area in which we are recruiting, we are, in a sense, looking for some of the same kinds of people. We are recruiting now not only from accounting and auditing academic backgrounds, but also in some of the same areas, like public administration, business administration, economics, mathematics, industrial engineering, statistics, and so on.

Relatively, the latter group is small compared with those who are trained in accounting and auditing, but you will also find that the curriculum for accounting and auditing majors is changing in the colleges and universities to include more emphasis on management and program analysis. There is much more emphasis given to some of these newer fields all across the board.

In fact, I believe Dr. Enthoven would now say that his best source of recruiting is not from economics majors, but from business administration, because there is more emphasis on quantification and emphasis on practical problems in the schools of business administration than there is in the schools of economics, which tend to be much more interested in economic theory, monetary theory, and so on.

But, yes, the answer is that we are in a highly competitive market. The Government is considerably below the private market in entrance salaries, at least.

In GAO we do not recruit except from the top 25 percent of the class. We have authority to recruit directly with respect to accounting and auditing. We do not have the same freedom to recruit in other

fields, except in economics and statistics. In other fields, we must recruit from the Federal Service Entrance Examination register and Management Intern register.

We have made a very major effort to recruit good people. We have an educator consultant panel which meets with us two or three times a year. This panel includes several deans of business schools. It also includes the dean of engineering at Johns Hopkins, a representative of the field of public administration, and so on. These people can help us relate our training programs to the changing curricula of the colleges and universities. They can help acquaint their own students with opportunities that would be presented if they came with our organization. They can also help us on our own internal training program.

Dr. FARBER. I wasn't thinking of the problem of the GAO alone, but I was thinking of the problem of the Executive agencies.

Mr. STAATS. We are part of a broader problem, yes. There is a shortage of these people.

I think enough people can be found, but the question is quality.

QUANTITATIVE AND QUALITATIVE ANALYSIS

Dr. TURTS. I have one more question I would like to ask, and I think it is rather fundamental.

This whole PPB approach is, of course, developing and changing. I believe some of the doubts I have heard expressed, and which were reflected this morning in some of the questioning, suggest the importance of giving due consideration in the analysis of policy problems to non-quantifiable elements as opposed to the more quantitative aspects.

I wonder whether, in your view, the PPB approach is moving to emphasize more of the qualitative factors, if I can use that term, to get a better balance between the qualitative judgments and the quantitative aspects of measuring cost-benefits in terms of dollar figures.

Mr. STAATS. I am not quite sure how to respond to your question.

There has been a great deal of discussion about social costs and benefits. Bert Gross, at Syracuse, has done a lot of work in this field. Senator Ribicoff has been interested in this area. I believe Senator Harris has a good deal of interest in it.

There are many ways of evaluating these programs, if you do not try to over-quantify the result. We can improve inputs of costs and we think we can develop better measurements of effectiveness and results of these types of programs.

We are undertaking probably the most difficult problem of evaluation possible in a review we are making of the poverty program. Here we are attempting to evaluate programs such as Head Start, the Community Action program, the Job Corps program, the Neighborhood Youth Center program, VISTA, and the Neighborhood Health Center program.

How do you evaluate the effectiveness of such programs in terms of meaningful results? It is easy to get numbers of people who participate. In some programs it is fairly easy to relate training to employment immediately following training. But when we look at the longer term effect of training, or what the longer term effect may be

of Head Start, we are dealing essentially with areas in which we have very little evaluative experience or data on which to conduct useful evaluations.

For this reason, we are giving a great deal of emphasis in this particular review to developing recommendations on a data management system which we hope will enable the Congress over a period of time, to get a better assessment on what program results have been achieved.

However, there are problems in developing such a system. For example, in the local Community Action Program, what kind of a record can be maintained with respect to what happens to a participant after he leaves the program? What kinds of tests can be made as he proceeds through this program? What are the critical test points where there ought to be some measurement of the effect on the participant?

Dr. TUFTS. All this suggests really a radical re-definition of that word "audit," doesn't it?

Mr. STAATS. In terms of a review or an evaluation of program results, it is an audit, but it is a different kind of audit. I would like to add, that we are seeking help in this review in the form of two contracts which we have let.

One of these is with Resources Management Corporation. The project leader is a former Rand Corporation man. The staff members have good backgrounds. They are working directly with our own staff in an attempt to sharpen up the criteria for evaluating programs of the kinds I have mentioned.

Secondly, we have contracted with Peat, Marwick, Livingston & Co. with respect to a data management system. How do we develop a data management system which is going to enable us to measure results?

Thirdly, we have arranged for a number of individuals who can serve as part-time consultants in different fields—health, education, training, and so on.

At the present time, we have roughly 200 of our own staff who are interviewing or trying to make judgments on administrative problems, and management, as well as on program effectiveness.

We recognize, when this is all through, that a large part of the result is still going to be subjective.

Dr. TUFTS. That is probably all to the good. It would broaden out the notion of what the auditing function really is.

That is all I have.

REVIEW OF PAST COST-BENEFIT ESTIMATES

Dr. FARBER. Have you made any studies of the cost-benefit estimates of the past or of past projections of budget totals to see how accurate they have been?

Mr. STAATS. You are referring here now to the water resources field?

Dr. FARBER. The water resources programs, or the BOB estimates in its 1961 projections of the Federal budget.

Mr. STAATS. One of the things we feel the PPB system does not adequately do, by the way, is to get at the question of how the predicted results of an analysis compare with the actual results a year or two or

three years hence. I think Mr. Schultze referred to this problem in his testimony. It is a matter of importance, because this is one of the ways we are going to learn.

Similarly, we feel that there has not been enough attention given to the development of good cost data on past performance. Some of the individuals who are concerned with PPB would argue that you don't really need this prior cost information, that you can do this on an analytical basis. We feel a little differently about it, in that we think it is only over a period of time that you can relate accurately projected costs to past costs. This may not provide a formula type answer, but it would certainly be a good benchmark to work against.

We have not, ourselves, made any "before and after" review of the cost-benefit ratios on water resource projects. We have talked about doing this, and I hope we can do it.

I believe that the Department of Interior might well do more in this area.

EXECUTIVE BRANCH REACTION TO PPBS

Dr. FARBER. So often it seems that a system works if the people who administer it like it. This is subjective judgment, I realize.

Do you have any view as to whether or not Executive departments and agencies like the PPB system?

Mr. STAATS. I haven't really made any survey. I have talked with quite a number of individuals who were directly involved in it. We hope to develop this point more in the review that we are undertaking.

I think there is a fairly widespread feeling that it has potential, but it perhaps has been over-formalized, and there may be too much paper work involved, and that instead of it being a continuing process, it is too sharply defined as a part of the annual budget presentation, which means that there is inadequate time in the agencies as well as in the Bureau of the Budget to give adequate attention to the program memoranda.

These are points of criticism that have been identified. I think there is a good deal of unhappiness about some aspects of present procedures.

One other point that has been made is that it tends to get out of focus in terms of the political realities involved in program decisions, and sometimes the people doing PPB analysis don't fully recognize that there are other considerations, political and otherwise, which have to enter into, and always will enter into, this process.

SHORTER OR LONGER TERM BUDGETARY PROJECTIONS?

Dr. FARBER. I have one final question.

The five-year projection seems to be creeping into the literature, and seems to be accepted for planning purposes. On the basis of your experience, do you feel that, because the conditions change more rapidly, a shorter period would be more advisable, or is it your feeling that we should be going the other direction with planning and projections, to a longer period?

Mr. STAATS. I don't think you can lump all of it into one package and say it all ought to be treated alike.

I think the usefulness of the planning is going to be, to some degree, in relationship to how meaningful advance projections can be made.

If we are undertaking an entirely new program, for example, it is important to analyze how it may develop, but the accuracy of the figures may be very, very poor. Whereas, if we are dealing with a program where we have long experience, and we can relate it to costs, then it would seem to me the longer the projection can be made, the better.

Dr. FARBER. So five years is a convenient compromise?

Mr. STAATS. It could have been three, or it could have been some other figure. Unless we are talking about the cost to complete a system, or the cost to complete a construction job, or the cost to complete the development of a river basin program over a definite time period, the estimates beyond three years tend to be interesting, but not accurate enough to be very meaningful; however, they may point up potential costs or benefits useful for decision-making.

Senator JACKSON. On behalf of the committee, Mr. Staats, I want to express to you our appreciation for what I think has been not only an excellent, but a brilliant, presentation. I have found it most helpful, and I am sure the members of the committee share my feeling about the way you have performed here today.

Mr. STAATS. Thank you very much.

Senator JACKSON. Your statement is really first-rate. This is an excellent, objective analysis of the problem that we are studying. I want to thank you again.

(The additional questions and answers referred to on p. 363 follow:)

MEMORANDUM OF QUESTIONS FROM SENATOR JACKSON AND RESPONSES
BY MR. STAATS

Question 1:

In August 1965, a "PPB system," based heavily on the experience of the Defense Department, was extended to all the major Federal agencies, without going through a period of testing and evolutionary experimentation in the civilian agencies. I understand some Bureau of the Budget officials would have preferred to test and experiment with PPB techniques and processes in one or two civilian agencies—to gain more experience with them and to get a better idea of what would really be helpful—prior to any Government-wide application of a PPB system.

You were Deputy Director of the BOB in August 1965, and we would be interested to hear your views now, in retrospect, on the August 1965 decision.

Response:

I doubt that we are far enough away from the decision of August 1965 to make any meaningful evaluation of the President's announced approach to extending PPB to all Government agencies in comparison to some other and more gradual approach which might have been used. In effecting any new method of doing things, it is natural, in the earlier stages of the effort, for the problems that emerge to get a great deal of attention and to overshadow accomplishment. As time goes on, however, advantages of the new method gain recognition and a more balanced judgment can be reached. Accordingly, it seems to me that the progress made in applying PPB Government-wide and the problems in achieving it must be viewed in a longer time perspective before one can feel comfortable with an opinion about the relative merits of

the approach used. It must be recognized that we shall never have an answer more reliable than informed opinion and that this will doubtless vary widely both in and outside of the Federal Government.

In August 1965 the objective was to bring PPB into effective Government-wide use as quickly as it was feasible to do so. Given this objective, the problem was to choose the approach most likely to accomplish it. The President's decision to move at once on a Government-wide basis drew public attention to this objective; it energized the whole Executive Branch machinery and set it to achieve the objective; and it made progress toward such achievement a matter of relatively frequent periodic testing in the regular processes of managing the Executive Branch. There is no question, however, that this approach has put a real strain on the machine, has led to mistakes, and has had some undesirable effects which run the risk of discredit to a basically desirable objective.

A more gradual approach would have caused less immediate disruption in established procedures for continuing analyses and in the preparation of budget justification. It would have made it possible to have focused on a set of priorities with respect to which program issues were more important rather than attempting to have such analyses made on the total budget and embracing both major and minor program issues. It would also have made it possible to give the agencies more opportunity to decide on how the function could best be organized and staffed in relation to existing budgeting and analytical staffs.

At the same time, it would have been essential that there be a definite time-phased plan to avoid the situation which occurs frequently in Government when important actions are allowed to drag out over too long a period of time. An example is the delay in placing in effect the decision of the Congress which was made in 1956 to require agencies to maintain their accounts on an accrual basis. It is not now expected that these accounts will be in a position to reflect accrued expenditures for the Government as a whole until the 1971 budget.

Question 2:

How crucial in the successful application of PPB within a Department is the enthusiastic, active participation of the Cabinet head?

In a memorandum to this committee on PPBS and Foreign Affairs, Professor Schelling made this point:

PPBS works best for an aggressive master; and where there is no master, or where the master wants the machinery to produce his decisions without his own participation, the value of PPBS is likely to be modest and, depending on the people, may even be negative.

I would welcome your comments.

Response:

Undoubtedly the successful application of PPB within a department depends to a great extent on the encouragement given by, and the involvement of, the department head. Doubtless, some of the formal documents produced by the PPB system, e.g., broad program memoranda, may be of more use to the department head than to his subordinates, although the formal requirement probably does improve the discipline of their own studies.

Professor Schelling's comment to the effect that the value of the PPB system may be negative where the responsible decisionmaker wants his subordinates to produce decisions without his participation, implies that PPB has little or no value to subordinates. As I have said in my previous testimony, the studies performed by the analysts will frequently not be able to adequately consider all of the non-quantitative aspects, political implications, etc. The ultimate choices of the agency head, and the Executive Office, will consider all aspects.

However, it seems to me that the principles of PPB are applicable to decision-making at all levels in an organization and should be useful to subordinates in making decisions where it is within their authority to make them. In fact the impact of PPB on decisions appropriately made at lower levels in an organization may be greater than on those reached at the very top because the lower level decisions are likely to involve fewer policy or political issues which are more difficult to evaluate, certainly in any quantitative way.

Thus, if Professor Schelling's "master" makes it clear that he wants decisions by his subordinates to be guided by PPB analyses, the results can be very worthwhile even though the "master" is not involved directly in the decision.

I believe the value of PPB to both the executives and to their subordinates depends upon a mutual understanding of its limitations.

Question 3:

Obviously, good analyses can be useful to decision-makers. But in extending PPB outside the Defense Department, the BOB has leaned toward requiring analyses on very many issues, and calling for completion of the studies by deadlines set in a rigid program and budget cycle.

What we should be after, certainly, are *high quality* policy studies and not just paperwork ground out to meet arbitrary deadlines.

Would it not be wiser to encourage *selective policy analyses* of certain important issues, to free them as far as possible from the routine deadlines of the program and budget cycle, and to allow whatever time is needed to get a thorough analysis—one that might be really useful and helpful?

I would appreciate your comments on this point.

Response:

Initially, the Bureau of the Budget, in its Bulletin No. 66-3, dated October 12, 1965, required specific deadlines to be met to establish a PPB program structure and to prepare program memoranda annually for use in the budget preview. Special in-depth studies were to be prepared from time to time as requested by top management, by the Bureau of the Budget, by line operating managers, and by the analytic staffs themselves.

On July 18, 1967, the Bureau of the Budget issued Bulletin No. 68-2 to replace Bulletin No. 66-3. Bulletin No. 68-2, like 66-3, requires that program memoranda be prepared each year, but provides that the Bureau of the Budget will generally indicate a staggered schedule of dates for submission of drafts of these memoranda. The final submission is required by September 30. Special studies are expected to provide the analytic basis for major decisions on program issues which are

discussed in the program memoranda, particularly where proposed new legislation is involved. In general, the new BOB bulletin tends to get away from deadlines as strict as those in the earlier bulletin.

I agree that the end result of the PPB process should be high quality studies rather than just paperwork generated to meet arbitrary deadlines. And they should be selective on the basis of issues identified by the agency heads and the Bureau of the Budget. I believe, however, that a formal requirement does impose a discipline on the analytical process which may be beneficial, depending upon the use made of the process by the agency head. Certainly, for the products of the analytical process to be most useful they should be related in some effective way to the budgeting process.

As I have said in my testimony, I believe the Congress can obtain the substantive analytical information it needs from the agencies. I believe these requests need to be established on the basis of "selective policy analyses" which can be accomplished for the Congress and the committees in the various ways I have discussed. However, I do not see this as being removed from the budget process of the agencies.

Question 4:

Public Law 90-174, often cited as the "Partnership for Health Amendments 1967", provides a portion of the appropriations for certain programs and grants to be available to the Secretary of Health, Education and Welfare for program evaluation. In this way, the Department attempts to provide itself, in a sense indirectly, with more support for a PPB staff, and to nail into the bill itself a provision for evaluation of the program.

What do you think of this arrangement, and would it have value in other areas like foreign aid and defense?

Response:

I believe this type of arrangement does have positive value, particularly if the legislation requires the agency concerned to make the evaluations available to congressional committees. When a program is initially authorized or when it is subsequently expanded, legislation requiring that cost and effectiveness evaluations be made will ensure that the agency will be able to respond to the needs of the Congress in this respect. These evaluations would be even more meaningful if the Congress, or the legislative or appropriations committees, specified alternatives to be analyzed or issues to be dealt with. I have commented in my testimony concerning the value to the Congress of requesting such evaluations from the agencies.

With respect to areas such as foreign aid and defense, I am not certain that it is necessary to prescribe a specific amount of money or a certain percentage of the appropriation to be made available for program evaluation. However, the inclusion of specific provisions by the Congress for evaluation in these areas should have great value. For many of these programs, measurement of effectiveness is extremely difficult, if not impossible, to quantify; and it is even difficult to develop reliable indicators of effectiveness in some cases. However, this does not mean that the effort should not be made because it is only through the process of preparation of systematic evaluations that we will develop ways to judge program effectiveness.

I, for one, would like to see the Congress more definitely a participant in the specification as to how frequently and the manner in which these evaluations are made. It seems to me that recognizing the qualification which I have stated, program evaluations can enable decisionmakers in both the legislative and executive branches to better understand the costs, the effectiveness, and the risks of programs even where complete quantification is not possible.

In the foreign assistance area, we in the General Accounting Office have been attempting to develop more adequate measures of the effectiveness of U.S. programs. In some respects the more significant aspects of our assistance programs are the most difficult to evaluate, particularly in a relatively short time period. We are obtaining the advice of a number of individuals in and out of government who have had useful experience or who have conducted research on the subject, and we are currently in the process of developing improved guidelines to assist our staff in making judgments and developing indicators of the effectiveness of these programs.

In summary, I would favor as much legislative participation in this process as possible, but I believe it important to recognize that any statutory language should give considerable flexibility for adapting evaluation approaches to differing programs. Perhaps sections of the committee reports on this point would be equally effective and useful and would provide greater flexibility to the Executive Branch agencies in developing such evaluations.

Question 5:

As you know, the PPB process and its information requirements have been added to those of the traditional budgetary systems. As some officials in the Executive Branch describe it there are now two worlds: the PPB world and the traditional world of Budget Circular No. A-11.

Can the process be simplified, and how would you suggest that it be done?

Response:

Bureau of the Budget Circular No. A-11 requires that a summary and highlight memorandum, organized along program lines, will lead off the budget submission of each agency. Along with the annual budget estimates, there will be submitted a Program Memorandum for each PPB program category and a multiyear Program and Financial Plan showing a summary of agency program costs and results. The agency is required to reconcile, for the budget year, the summary program cost information shown in the Program and Financial Plan to the agency appropriation structure under which the programs are financed.

The requirements of Bureau of the Budget Circular No. A-11 as supplemented by Bureau of the Budget Bulletin No. 68-2 on PPB are designed to move Executive Branch officials in the direction of a budget justified and initially conceived in terms of program costs and outputs. I note that Circular A-11 is mentioned no less than five times in Bulletin 68-2, calling attention to the requirement for consistency between the two.

Undoubtedly the PPB process as outlined by the Bureau of the Budget has resulted in expanded information requirements. However, some of the information needed to implement PPB was being developed and used by officials in their budget submissions prior to the formal announcement of PPB for civil agencies in 1965. Consideration should be given to combining the best features of both budget submissions into a single package. However, I believe preparation of the basic data on programs and budgets is relatively more costly than the reporting of the data to the Bureau of the Budget. Therefore, the first consideration, it seems to me, is whether the basic analyses and data are prepared in the agencies so as to serve both purposes. If this is not the case, the process is, I believe, more costly than necessary, and worse, may reflect some lack of co-ordination within the agency. In the further development and perfection of PPB, this problem must receive a great deal of attention.

We expect to include this question in our review of PPB which we are now undertaking.

(Whereupon, at 12:45 p.m., the subcommittee recessed, to reconvene at the call of the Chair.)



PLANNING—PROGRAMMING—BUDGETING

HEARINGS
BEFORE THE
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS
OF THE
COMMITTEE ON
GOVERNMENT OPERATIONS
UNITED STATES SENATE
NINETIETH CONGRESS
SECOND SESSION

PART 4

WITH
WILLIAM S. GAUD, ADMINISTRATOR,
AGENCY FOR INTERNATIONAL DEVELOPMENT

JULY 11, 1968



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PLANNING—PROGRAMMING—BUDGETING

THURSDAY, JULY 11, 1968

U.S. SENATE,
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

[This hearing was held in executive session and subsequently ordered made public by the chairman of the subcommittee.]

The subcommittee met at 10 a.m., pursuant to notice, in room 3112, New Senate Office Building, Senator Henry M. Jackson (chairman of the subcommittee) presiding.

Present: Senators Jackson, Metcalf, Mundt, and Baker.

Subcommittee staff members present: Dorothy Fosdick, staff director; Robert W. Tufts, chief consultant; Judith J. Spahr, chief clerk; Richard E. Brown, research assistant; and William O. Farber, minority consultant.

A.I.D. staff present: Curtis Farrar, Deputy Assistant Administrator, Office of Program and Policy Coordination.

OPENING STATEMENT OF THE CHAIRMAN

Senator JACKSON. The subcommittee will be in order.

We continue this morning our hearings in the subcommittee's review of the planning-programming-budgeting system in the national security area. Our study is being conducted in a nonpartisan and professional spirit.

We are considering today the prospects and risks in the application of PPB in the field of foreign affairs.

Members of Congress have a number of basic questions about the use of the PPB system for foreign affairs as should be evident from prior hearings before this subcommittee and from certain of our other subcommittee publications.

At this point I might emphasize three reasons for proceeding with caution in the application of PPBS to foreign affairs and some associated questions of interest to the committee:

First, the obvious differences between decision-making in defense and foreign policy of course preclude any simple transfer of PPBS from Defense to State, A.I.D., USIA, and the Peace Corps. In the nature of things defense planning involves long leadtimes and the factors relevant to many defense decisions are at least in large part conceptually quantifiable. But it is also in the nature of things that foreign policies can seldom be projected far ahead except in the broadest terms, planning should not impair a capacity for quick response

to changing circumstances, and the weight of intangibles often exceeds that of the measurable factors bearing on decisions. For these and other reasons the usefulness in foreign policy planning of an approach patterned on the Defense system is necessarily limited. Other approaches and other kinds of analysis are called for.

Have the PPB requirements for Program Memoranda and Special Analytic Studies resulted in the development of new and helpful kinds of policy analysis for foreign affairs problems? What important new approaches to foreign policy analysis are in prospect?

Second, PPBS, as now understood, assumes a means-ends calculus and places a heavy stress on a quantitative evaluation of estimated costs and benefits. The effort to find quantitative surrogates for qualitative judgments may lead to much irrelevant and time-consuming paperwork and more seriously to a distortion of the issues with which decision-makers should be concerned. Policy planning and performance evaluation are subject to many of the same difficulties, constraints, and limitations in foreign affairs as in domestic social affairs.

Is there a danger that the suppleness and flexibility needed in the planning and conduct of foreign policy may be impaired by an over-emphasis on the PPBS approach?

Third, in the area of foreign affairs there is a substantial interdepartmental problem. While the Secretary of State directly controls the State Department and the Foreign Service, he has varying and limited control over the other agencies involved in foreign policy.

Is foreign affairs programming, as its supporters claim, a promising device for extending and making more effective the leadership by the Secretary of State of the foreign affairs community? Is this what a Secretary of State and a President want? Is this what Congress wants? Would a thorough-going application of PPBS to foreign affairs yield sufficient leadership dividends to justify a move away from the decentralized initiative and responsibility of agencies like A.I.D., USIA, and the Peace Corps?

Considering the basic issues that are involved in foreign affairs programming, it is small wonder that the Budget Bureau and the State Department, to use the words of BOB Director Charles Zwick, are "moving forward pragmatically and deliberately."

In view of the historical facts, one must challenge the oft-repeated view that program budgeting, installed in the Defense Department in 1962-3, marked an entirely new advance. The concept of "program budgeting", of course, goes back many decades. As early as 1960, the Federal Aviation Agency had a program budget and a comprehensive five-year planning system, and special analytical techniques were in use. In preparing foreign aid budgets, the A.I.D. agency over the years has had considerable experience in program-oriented analysis and forward planning.

It seemed particularly appropriate to call as our witness today, Mr. William S. Gaud, Administrator of the Agency for International Development.

This nation can be profoundly grateful for dedicated and distinguished private citizens like Mr. Gaud who have answered the call to national duty in war and in peace.

During World War II, as a member of the staff of General Joseph Stilwell from 1942 to 1945, Mr. Gaud administered military lend-lease

in China, India and Burma. From 1945 to 1946 he was Special Assistant to Secretary of War Patterson.

He returned to private life in 1946 as a partner in the law firm of Carter, Ledyard and Milburn in New York City.

Fifteen years later, in 1961, he again answered the call of public duty and was appointed A.I.D. Assistant Administrator for Near East and South Asia, serving in that capacity until February 1964 when he was appointed Deputy Administrator of A.I.D. He was appointed to his present position as Administrator of the Agency for International Development by President Johnson in August 1966.

We greatly look forward to your testimony, Mr. Gaud. You may proceed in your own way.

TESTIMONY OF HON. WILLIAM S. GAUD, ADMINISTRATOR, AGENCY FOR INTERNATIONAL DEVELOPMENT

Mr. GAUD. Thank you, Mr. Chairman.

I am very glad to have this opportunity to appear before you to discuss A.I.D.'s experience with the Planning, Programming, and Budgeting System (PPBS). Let me start by telling you something about A.I.D.'s past experience with these matters, and then describe where we stand today. I would then like to discuss the usefulness and limitations of PPBS insofar as the foreign aid program is concerned, and conclude with a statement of my views on how PPBS fits into the foreign affairs field generally.

I. HISTORICAL SURVEY OF FOREIGN AID PROGRAMMING

In a general sense one might trace A.I.D.'s present programming system all the way back to the Marshall Plan. From its inception, the Marshall Plan grappled with the problem of budgeting for functional countrywide objectives, rather than for isolated inputs or outputs. The overall goal was European economic recovery, and it was possible to work back from this goal to a four-year aid budget in which costs and results were easily and visibly connected.

This approach fell into disuse as the focus of aid shifted to the less developed countries of Asia, Latin America, and Africa. The initial hope of the "Point IV" Program of the Technical Cooperation Administration, which began in 1950, was that simply bridging technological gaps would bring rapid development. Budgeting was relatively easy: it emphasized the preparation of as many worthwhile projects as could be funded. Creation of the Development Loan Fund (DLF) in 1957 reflected recognition that capital aid, as well as technical assistance, was required. But like Point IV, the DLF operated on the philosophy that good projects were enough to do the job.

At the same time there was a growing feeling that something was missing in this project approach to foreign aid. Both our own development people and the governments of the countries receiving American aid gained better understanding of the ways in which the investment, trade, fiscal and monetary problems—and indeed the social and political problems—of a country all influence one another. It was apparent that it was not enough to do worthwhile but isolated projects.

This firmer grasp of the nature of the development problem led to

the country programming approach: the planning of assistance in relation to each country's overall development. Objectives, and the means of reaching those objectives, were set in the light of each country's resources and prospects.

The country programming idea was formally incorporated in ICA Manual Order 1021.1 issued in May 1958. It stated:

ICA programs are developed to accomplish specific U.S. country objectives and the accomplishment of such objectives is their sole function . . .

The program development process starts with the identification and precise statement of the U.S. country objectives; it then defines and analyzes the problems which must be solved in order to attain those objectives; and, finally, it develops programs designed to solve these problems and thereby to make possible the attainment of such objectives.

The merger of ICA and the DLF in 1961 to form the Agency for International Development (A.I.D.) brought major programming changes. One of the working groups established under President Kennedy's Task Force on Foreign Assistance in 1961 dealt specifically with planning and programming. It recommended intensification of the country programming approach. It suggested long-term analysis to clarify the costs of each program over several years. These recommendations were refined by the newly created Office of Program Coordination headed by Dr. Hollis Chenery, now of Harvard University. They were incorporated in a series of instructions issued to the field missions in 1962. Shortly thereafter, David Bell resigned as Director of the Bureau of the Budget to become the head of A.I.D. Under his leadership the new programming guidelines became the overall programming system for foreign economic assistance.

Perhaps most important, new A.I.D. *policies* accompanied the new programming approach. One of these was increased concentration of development aid in the most promising countries. Another was explicit use of aid to stimulate "self-help"—connecting our assistance to policy reforms by the governments of recipient countries, and to maximum use of their own resources for development.

The principal programming instrument for aid to major countries was a document prepared by the field mission. It was called the Long-Range Assistance Strategy (LAS). Interested Washington officials and specialists, with outside consultants as needed, worked with the Country Teams in preparing this document.

The LAS demanded much more comprehensive—and longer-term—analysis than the previous annual country program submissions. It also called for explicit analysis of a number of program alternatives. It compared different time periods, as well as such alternatives as supporting the country's official development plan as against using aid to focus the official plan more on previously neglected problems. The various program alternatives and the results they were expected to achieve were expressed in terms of their monetary costs, though it was understood that the discussion of results was at best based on estimates.

For countries not submitting an LAS in any year, the new system called for a Country Assistance Program (CAP). Its design paralleled that of the LAS, but it was briefer.

These procedures imbedded a number of vital concepts in A.I.D.'s operations: country programming, budgeting for objectives rather than for activities, assessing costs over multi-year periods, and analyzing and choosing among alternative aid strategies. Accordingly,

in August 1965, when President Johnson announced Government-wide adoption of the PPB System, the directive came to A.I.D. not as a shock, but as a fillip. In fact it was a confirmation of what we were already doing.

Thus, U.S. foreign aid programming has a long history, and is still evolving. Attachment 1 gives a more detailed chronology of this history.

II. PPBS IN A.I.D. TODAY

Now I would like to describe our present system. The program cycle, or schedule, for each fiscal year's operations extends over a period of about eighteen months. (The approximate timing of the many steps in the cycle is shown in Attachment 2.) The cycle starts in February with Washington guidances to the field, which raise questions based on the previous annual review of the program and on current operations.

The A.I.D. mission, working with other members of the Country Team, addresses these questions when it prepares the Program Memorandum, or PM, which is the central document specified by the Budget Bureau for the Government-wide PPB System.

The PM presents the field's analysis and recommendations of what the next fiscal year's aid program should be in that country. It defines the major budgetary issues, discusses the connections between aid inputs and U.S. objectives, compares alternative aid levels and aid compositions, and summarizes the country's development problems. During July and August the PMs, which must have ambassadorial approval, are submitted to Washington.

Intensive review comes next. The Washington staffs, both of A.I.D. and other agencies, analyze the PMs and raise issues for my consideration. I hold a series of review meetings: first, of the major country PMs to make initial judgments of the priorities within each country; second of regions; and third of the world-wide program. These review meetings weigh the needs of one country or region vis-a-vis the others. The State Department, the Budget Bureau, and other foreign affairs agencies participate in these reviews.

In mid-October, after clearance with the Secretary of State, I submit my recommended overall budget to the Budget Bureau. This submission highlights the major issues in individual countries and indicates the alternatives I have rejected and the general reasoning behind my recommendations. The Budget Bureau staff—having participated in the review process—is already thoroughly familiar with these proposals. As a result, any remaining issues are readily apparent and decided at the top level. An A.I.D. budget then becomes part of the President's January budget.

I might say that this past year this review process in Washington resulted in our cutting out from the submissions that we got from the field about \$800 million of requests. The total Presidential budget for foreign aid was \$2.5 billion for fiscal year 1969. That was after we here in Washington had eliminated \$800 million of additional requests.

Senator JACKSON. How long has this review procedure been in effect?

Mr. GAUD. Well, it was in effect when I came to the agency in 1961.

Senator JACKSON. But you have refined the procedures?

Mr. GAUD. It has been enlarged and refined both under Mr. Bell and under me.

Senator JACKSON. Were the cuts in the past as great as this last year?

Mr. GAUD. The cuts below the submissions from the field?

Senator JACKSON. Yes.

Mr. GAUD. Yes. Pretty much. That is not unusual.

Next comes presentation to the Congress, and—sometime later—Congressional action on the Agency's authorization and appropriation bills. The final step—which should come in late June or early July but more commonly occurs in the last quarter of the calendar year after Congress acts—is the issuance of an Operational Year Budget which allocates the available funds. The deep cuts which the Congress has made in our budget in recent years have necessitated an additional re-examination of the program before an Operational Year Budget can be issued.

The rigorous analysis which goes on throughout the program cycle is almost bound to produce better budget decisions, and I believe it is in fact doing so. Furthermore, as we go on to learn how to make the best use of the PM, I expect our budget work to continue to improve.

The PM, of course, does not tell the whole story of the program decisions for a country. There is separate programming for individual technical assistance projects, capital projects and PL 480. In addition we conduct program evaluation beyond that contained in the PM.

In technical assistance, comparisons of the expected benefits of alternative projects are often hard to make. Sound management in technical assistance usually consists in getting the right people to the right place, seeing what works and then backing them up with the support they need. To tighten the management of our technical assistance projects, A.I.D. is now introducing a special three-phase programming and appraisal system for such projects. The first phase is the project proposal, which defines the relationship of the project to development objectives in the country and indicates what personnel and financial inputs are needed to carry it out. The second phase is a detailed, year-by-year schedule of inputs and expected achievements. This gives us a continuing check on performance. The third phase is an annual Project Appraisal which exposes any difficulties being experienced, as well as their causes, and indicates whether the project should be continued, changed or dropped. We expect that this system will permit increased support for those projects that are going well and prompt elimination of those that are not.

For capital projects, the programming procedure is already well established. The successive results of a feasibility study, a detailed engineering analysis and a financial and economic analysis are pulled together in a project loan paper. Each project loan is then reviewed and cleared by the interagency Development Loan Committee before it comes to me for approval.

The programming of PL 480 commodities is another element in the full system. When the Food for Freedom program was modified in 1966, the principle was clearly established that food aid should be used to promote agricultural development in the less developed countries. Joint programming by A.I.D. and the Department of Agriculture was set up. A PL 480 Program Memorandum which we prepare in the spring is used by the USDA in setting domestic grain acreages.

A second PM, prepared in the fall, is based on later estimates of worldwide food production and is used to arrive at the PL 480 sales program for the next fiscal year. In addition, PL 480 sales agreements and A.I.D. loans are increasingly being considered together in determining assistance programs for individual countries.

Finally, let me mention our arrangements for evaluation studies. In April of this year, I installed a new procedure to pull together and strengthen our existing evaluation efforts. Each of our larger field missions will now have a full-time Program Evaluation Officer to organize regular evaluation of particular aspects of the program in the country involved. Evaluation Officers in the Regional Bureaus in Washington will coordinate and support the field studies, and a slightly enlarged central Evaluation Staff will undertake additional Agency-wide studies. To make certain that evaluation gets the full emphasis it deserves, I have named Mr. Joel Bernstein, recently our Mission Director in Korea, to a newly established post—Special Assistant for Evaluation in my office.

III. USEFULNESS AND LIMITATIONS OF PPBS IN A.I.D.

A.I.D. has found the basic approach of the PPB system quite useful. Programming, of course, is only an instrument of management—not a substitute for it. Sound management also includes good housekeeping and much else besides. But let me indicate where PPBS has helped most and helped least.

Within the broad framework of overall foreign policy, A.I.D. programs can be roughly divided into two categories—those oriented toward long-term development, and those that address a variety of more immediate political and security concerns. Development Loans, Technical Assistance and many of the programs of the Alliance for Progress focus essentially on long-term development. Together they account for nearly three quarters of our appropriations request. Supporting Assistance, which is designed for the short-term, accounts for most of the other quarter. Of this, the great bulk is for economic activities in Vietnam, though Supporting Assistance also goes to such countries as Laos and the Dominican Republic.

Formal analysis is of only limited use in the programming of Supporting Assistance. Our objectives in this area tend to be *ad hoc*, the costs over a period of years highly uncertain, and the choice among means quite limited. These are essentially political programs rather than economic programs.

There are also limitations on the role of PPBS in programming longer-term development assistance. The ultimate objective of our development aid is a community of free and progressive nations cooperating on matters of mutual concern. U.S. aid contributes to this objective by assisting less developed countries to maintain their independence and become self-supporting. As an instrument of foreign policy, the foreign aid program necessarily reflects the intangibles of the political process, and so do many of the decisions we make about the program.

Formal programming cannot be relied upon to make essentially political decisions. Formal analysis may tell us something about which countries offer the best economic prospects for development aid

(though intangibles also affect this point). But political judgments play a major role in determining which countries we consider eligible for aid. We do not aid countries that clearly oppose our foreign policy. Also, political events like last year's fighting in the Middle East or the earlier hostilities between India and Pakistan may lead to the termination or reduction of aid. In addition, countries with which we have historic associations may receive high levels of aid compared to their neighbors.

Other political intangibles also enter the programming of long-term development assistance. The strength of the development effort which a host country is making—or will make—is crucial. Do the country's leaders have the foresight to make the politically difficult decisions on which development depends? Do they have the ability and support—the political support—to make these decisions and carry them out? Do they have the courage? These variables can only be judged with the benefit of experience and on-the-scene observation—and then not always correctly!

PPBS considerations do have a pervasive and powerful influence on the allocation of funds within and among what we call the development emphasis countries. These are the countries where major development programs account for the bulk of our Development Loan, Technical Cooperation and Alliance for Progress funds. There are less than a dozen of these large programs, but they consume over four-fifths of our bilateral development assistance programs. It is especially these programs which we try to adjust in response to changing performance and self-help on the part of the recipient countries.

Formal analysis is particularly helpful in deciding on the composition of individual country programs. Here cost-benefit comparisons can be directly applied. Here we can tighten the links between aid activities and U.S. objectives. Here we attempt to assess the merits of alternative combinations of aid aimed at similar objectives.

Thus, it is fair to say that the shape of A.I.D.'s worldwide program over a period of years is influenced substantially by systematic assessment of past aid and past performance, and by analyzing the year-by-year consequences of expanding or curtailing our program in each country.

It goes without saying that in stimulating and supporting development we concern ourselves with a host of objectives. In the economic sphere, we are interested not only in increases in Gross National Product, but equally in improving farm income, import liberalization and tax reforms. Social reforms and political growth are also essential parts of the development process. Institutional development, legal and other reforms, improved social services, increased popular participation in politics, government and economic activity—all these and many other things which are not easily encompassed in a neat programming system add up to modernization.

Professor Schelling has already told this committee that—

foreign affairs is a complicated and disorderly business, full of surprises, demanding hard choices that must often be based on judgment rather than analysis, involving relations with more than a hundred countries diverse in their traditions and political institutions—all taking place in a world that changes so rapidly that memory and experience are quickly out of date.

Foreign aid is part of the foreign affairs business. The very fact that we work in a "complicated and disorderly" field full of imponder-

ables and uncertainties makes it important for us to have the best analytical tools that are available. It is the very complexity of decision-making in foreign aid that puts a premium on clear understanding of our objectives, of alternative means of reaching them and of the costs involved.

PPBS has been very helpful in clarifying some of the decisions we make, and of little use in others. On balance I would say that it has become an important tool in arriving at executive judgments in the field of foreign aid.

IV. THE PLACE OF PPBS IN THE OVERALL FOREIGN AFFAIRS FIELD

I would now like to say a few words as to whether the PPBS concept should be applied to the foreign affairs field as a whole in the way it now applies to the Department of Defense.

As I have already pointed out, we in A.I.D. have had some success in developing a partially quantified programming system. Does it follow from this that the DOD system of unified budget control—or a reasonable facsimile thereof—should be transplanted across the river? I don't think so.

Professor Schelling points out in his excellent memorandum on "PPBS and Foreign Affairs" that there is no foreign affairs budget to which PPBS can be applied. Also that there is no overall foreign affairs office or agency—no foreign affairs counterpart of the DOD—to apply it. At least in theory, these deficiencies (if they be such) could be remedied. An overall Foreign Affairs Department *could* be created and it *could* be given budgetary control over all foreign affairs activities.

However, I doubt that this would be desirable. PPBS is useful primarily in making budget decisions. And the most important decisions in foreign affairs are not budgetary. Nor can they ordinarily be expressed in quantitative terms.

The DOD analogy is inapplicable for another reason. There is far less overlap between the foreign affairs agencies than there is between the armed services, less chance of their carrying on competing programs and fewer opportunities for trade-offs between their programs. Conflicts in roles and missions are not now and never have been a serious problem on this side of the river.

Consider our foreign affairs agencies and activities—State, A.I.D., USIA, the Peace Corps, the Export-Import Bank, PL 480 and military assistance. The capabilities of A.I.D. and the Peace Corps—of USIA and State—are not interchangeable. Each of the agencies operating in the foreign affairs field has a different set of immediate goals. The program of each is tailored to achieve those goals. Ultimately, all these goals converge in the general objectives of United States foreign policy. But the contributions of each program are different, rarely competitive and hard to measure in monetary or quantitative terms. I am by no means convinced that unified budget control would improve their performance, enable them to achieve their objectives more easily, or effect substantial tax savings.

Having said this, I want to make two things clear. First, I do not mean to downgrade the importance of careful and systematic planning, programming and budgeting within the individual foreign affairs

agencies. I know nothing of these matters in agencies other than A.I.D. I do know that careful planning, programming and budgeting should be and are matters of continuing concern within A.I.D.

Second, the Secretary of State must be in a position not only to determine foreign policy but also to police it—to see that his policy determinations are adhered to by all agencies dealing with foreign affairs. Unified budget control is one way of accomplishing this, as Professor Schelling has said. But it is not the only way. Nor is it necessarily the best way. Today's State-A.I.D. relationship is an excellent example of how the Secretary of State can exercise policy control without undue centralization and without unified budget control. Section 622(c) of the Foreign Assistance Act provides as follows:

Under the direction of the President, the Secretary of State shall be responsible for the continuous supervision and general direction of economic assistance and military assistance and sales programs, including but not limited to determining whether there shall be a military assistance (including civic action) or sales program for a country and the value thereof, to the end that such programs are effectively integrated both at home and abroad and the foreign policy of the United States is best served thereby.

Consistent with this, the Administrator of A.I.D. reports directly to the Secretary of State. Except in this respect, neither he nor his subordinates are in the State Department chain of command. But the Agency is organized on substantially the same geographical basis as the State Department. Each Assistant Secretary of State, Office Director and the like has a counterpart in A.I.D., and these geographical bureaus and offices of State and A.I.D. are located as near as possible to each other.

This structure makes for close coordination and an intimate working relationship between State and A.I.D. The Administrator attends the daily staff meetings of the Secretary. The Assistant Administrators attend the daily staff meetings of the appropriate Assistant Secretary. Through a comprehensive system of clearances, conferences, and day-to-day working relationships, State is kept fully informed of all A.I.D. activities and A.I.D. is kept equally well informed of State policies and activities in which it has an interest. State people and A.I.D. people dealing with the same country virtually live in each other's pockets.

State Department participation in A.I.D. programming begins in the field. The Ambassador as head of the Country Team must review and approve all Program Memoranda and other planning, programming and budgeting documents originating in the A.I.D. mission. Here in Washington the appropriate Assistant Secretaries of State or their representatives participate in A.I.D. program reviews at the level of both the Assistant Administrator and the Administrator. Furthermore, before the A.I.D. budget is submitted to the Budget Bureau, the Administrator reviews it with the Secretary (or the Under Secretary on his behalf). This past year the Under Secretary participated with the Administrator in presenting the A.I.D. budget to the Budget Director and in discussing the issues raised by the Budget Director after his review of the budget proposal.

This close coordination between State and A.I.D. has two consequences. On the one hand, it minimizes the risk that A.I.D. and State

will gallop off in different policy directions. On the other hand, it serves to bring out whatever political-economic issues may arise and elevate them to the highest level necessary for their solution. This is extremely important, and it would not be so apt to happen if State and A.I.D. were a single unified organization.

I do not suggest that the State-A.I.D. pattern will necessarily fit all the agencies operating in the foreign affairs field. But I do say that the State-A.I.D. relationship proves that effective policy control can be exercised by the State Department without the kind of unified budget control that exists in the Pentagon.

Concededly, effective bilateral coordination between State and A.I.D., or between State and other foreign affairs agencies, is not enough. Multilateral coordination is also essential. Overseas, the device of the Country Team achieves this. Here in Washington the SIG and the IRGS provide a forum for multilateral coordination of foreign policy decisions.

These institutions are new. They are still developing. They are clearly adequate to deal with specific issues. They have not yet demonstrated as convincingly their ability to deal effectively with general policy matters. But there is no inherent reason why they cannot do so. Last fall, for example, the proposed A.I.D. budget was submitted to the SIG for discussion, review and recommendation before it was presented to the Budget Bureau. This was a step in the right direction. It should serve as a precedent for the future.

Mr. Chairman, I will be happy to answer any questions which you or the members of the Committee have for me.

Attachment 1

CHRONOLOGY OF FOREIGN ASSISTANCE PROGRAMMING IN A.I.D. AND PREDECESSOR AGENCIES

(With highlights of foreign affairs coordination arrangements)

Introductory Note.—During the period 1948–1953 U.S. foreign assistance to underdeveloped countries (i.e., non-Marshall Plan countries) was programmed on an ad hoc annual basis first through the Economic Cooperation Administration, then through the Mutual Security Administration, and finally through the Technical Cooperation Administration. The concept of a country program combining the various U.S. assistance activities did not fully emerge until after this period, although at the U.S. national level the Mutual Security Administrator was charged with the coordination through budget control of the various agencies operating regional programs, while at the country level U.S. Ambassadors were given increasing coordinating responsibilities including a specific Executive Order to that effect in 1952.

1953–1955 FOREIGN OPERATIONS ADMINISTRATION

Annual Program Submission

Ad hoc instructions to the field were issued annually for submission of the country program in airgram form—basically a budget request document. These instructions were supplemented in 1954 with a codified project documentation system, known as “blueprint” and using pre-printed formats, which provided project data submitted initially in the country program airgram and amended as needed throughout the fiscal year.

Foreign Affairs Coordination

The Operations Coordinating Board was established with the Under Secretary of State as Chairman.

1955-1961 INTERNATIONAL COOPERATION ADMINISTRATION

1957-1961 DEVELOPMENT LOAN FUND

Annual Program Submission

The annual airgram submission of the country program and "blueprint" supporting documents continued basically as developed under the FOA until 1958. The annual budget call in the Spring of 1958 for FY 1960 introduced "greenprint"—a new ICA programming procedure. The country submission was referred to as the Master Program Book and included both technical cooperation and development loan objectives. Project details were summarized in a new table (E-1) although not all "blueprint" documentation was scuttled. "Greenprint" Manual Orders: (M.O. 1021.1, 1021.2 and 1021.5) were issued on July 1, 1959.

The FY 1961 and 1962 field program submissions were developed under annual guidelines which revised but did not change "greenprint" and they were referred to as Country Program Books. The last ICA program submissions followed the "greenprint" system and were referred to as Field Proposed Programs for FY 1963.

In 1957 the Development Loan Fund was established as an autonomous agency apart from ICA. Programming procedures for DLF were spelled out in the Report of the Procedures Study Group, October 9, 1957. Its operations were to be coordinated under the Ambassador at the country level and through the Operations Coordinating Board at the national level. Although ICA field program submissions identified development loan objectives these served merely as suggestions on which the DLF could act and not as definite budget or program requests.

Foreign Affairs Coordination

The Operations Coordinating Board was continued during this period. In 1956 the U.S. Ambassadors were instructed to exercise leadership and supervision of all U.S. Government operations in their respective countries—excluding intelligence and military operations.

1961-1968 AGENCY FOR INTERNATIONAL DEVELOPMENT

Annual Program Submission

With the establishment of A.I.D. as an integral part of the State Department, a new programming system was introduced generally following the format of the ICA system but calling for a program more closely tied to or identified with U.S. objectives. This was to be achieved through the CAP (Country Assistance Program) for most countries and through the LAS (Long-range Assistance Strategy) for selected key countries. (M.O. 1021.2, 1022.1, 1023.1, August 1, 1962). These were to be multi-year planning documents involving all aid instruments (DLF had been absorbed by A.I.D.) and setting out a program hierarchy working down from overall objectives through goal plans to supporting program and project details. This system with modifications, was applicable for all missions for the FY 1964, FY 1965, FY 1966, and FY 1967 program submissions.

Following the issuance of BOB Bulletin 66-3 calling for the establishment of PPBS in selected U.S. Government agencies, A.I.D. issued instructions (M.O. 1023.2.2, April 22, 1966) to nine major country missions to prepare a new document in keeping with the BOB guidelines to be known as a Program Memorandum (PM). These were first submitted for FY 1968. The other country missions were requested to submit improved FY 1968 CAP's in keeping with the PM instructions (M.O. 1023.2.3, June 22, 1966). The nine country missions were also requested to prepare a Program and Financial Plan (PFP) which would give them a comprehensive tabular presentation of all (U.S. and other) inputs and outputs.

The new A.I.D. PPBS was expanded for FY 1969 to include all country programs except Vietnam and phase-out or "U.S. presence" programs (M.O. 1023.2.5, June 2, 1967). Each mission was requested to submit a PM. The FY 1968 PFP instructions were thoroughly revised and eight country missions were requested to prepare PFP's focusing only on quantifiable, U.S. inputs. The PM was to be prepared in two stages—the first part, the Multi-year Strategy Plan, to be sent in for review in the Spring, and the second, the Aggregate and Sectoral Plans (and revised Part I), to be submitted in the Fall for budget review.

The FY 1970 instructions (General Airgram AIDTO Circ XA 2511, March 5, 1968) revised the instructions for the previous year by deleting the requirement for the Spring review of the Multi-year Strategy Plan and abolishing the PFP in its entirety.

A new project documentation system was developed which was introduced as a requirement for the FY 1969 program submission calling for a separate project budget submission to be submitted subsequent to the PM and establishing a schedule for decycling the bulk of project detail and information (M.O. 1023.2.7, June 2, 1967). The project budget submission (PBS) was again required for FY 1970 as a summary of the budget requirements of all active or proposed projects in each mission leaving the project details to be submitted on a decycled, as-needed or when-relevant basis (M.O. 1023.2.8, June 13, 1968).

Procedures for program evaluation were set up within the general framework of the FY 1970 program guidance. These procedures call for continuing evaluation of A.I.D. mission activities at the project as well as the overall program level (General Airgram, AIDTO Circ XA-2931, April 13, 1968).

Foreign Affairs Coordination

At about the same time A.I.D. was established as an Agency of the State Department the Operations Coordinating Board was abolished. In 1961 U.S. ambassadors were given managerial responsibility for the A.I.D. program in their respective countries. National Policy Papers were also initiated in 1961 which identified U.S. (multi-agency) objectives and laid out 3-5 year strategy per country.

In 1963 State launched the first experiment in multi-agency foreign affairs programming—the CCPS (Comprehensive Country Planning System). Country Program Books for 30 countries were produced matching all U.S. inputs to U.S. objectives but making no attempt to link the information thus produced to the budget process. In 1964 the results of the CCPS were evaluated and in 1965 a new approach—EROP (Executive Review of Overseas Programs)—was launched in thirteen countries. This was aimed mainly at cost reduction and efficiency of operations.

In 1966 the EROP was changed to FAPS (Foreign Affairs Programming System) following the general guidelines laid out in BOB Bulletin 66-3 (establishing a USG PPBS) and NSAM 341 was issued giving the Secretary of State the coordinating authority for all U.S. overseas activities and creating the Senior Inter-departmental Group (SIG) and the Inter-departmental Regional Groups (IRG's). The Hitch Committee report, late in 1966, recommending a combined foreign affairs programming system was not adopted, and in 1967 the formal Foreign Affairs Programming System was abolished.

The (State) Bureau of Inter-American Affairs (ARA) and the (A.I.D.) Bureau for Latin America (LA), combined organizationally under the single leadership of the Assistant Secretary of State for Inter-American Affairs, began a study in 1966 closely coordinated with but separate from the Hitch Committee. This led to the development of the multi-agency Country Analysis and Strategy Paper which was required of all Latin American Country Teams and was first submitted in the spring of 1967. This paper, after IRG review and revision, formed the basis of the strategy sections for both the FY 1969 and FY 1970 PM's from LA A.I.D. missions.

Attachment 2

A.I.D.'s PROGRAM CYCLE

(A Composite of FY 1968, 1969 and 1970 Experience)

Jan-Mar Worldwide Program and Budget Guidelines

The A.I.D./Washington annual budget call outlines the format to be followed in preparing the PM (Program Memorandum) and supporting documents, and identifies the substantive emphases which A.I.D./W and current legislation call for in country programming.

Jan-Feb CASP message (ARA/LA Bureau only)

The annual call issued by the Bureau of Inter-American Affairs and Bureau of Latin American Affairs to country teams in Latin America outlines the requirements for the Country Analysis and Strategy Paper.

Mar-May Country and Regional Guidelines

The Regional Bureaus issue more specific substantive guidelines, cleared within A.I.D./W, to be followed by the individual USAID missions in preparation of country PM's.

Mar-Jun CASP Spring Reviews

The ARA/LA CASP's are reviewed by the ARA/LA Bureau and the Latin America IRG, and changes are recommended which guide the A.I.D. PM's under preparation.

May-Jun Some country PM's may be submitted in draft—in whole or in part.

Jul-Aug PM submissions to A.I.D./W

Each USAID mission is assigned a deadline date when its PM is due in A.I.D./W for printing, distribution and review. These dates are staggered to avoid an inundation of PM's on one date from all over the world. Screening by A.I.D./W staff proceeds throughout this period.

Aug-Oct Country and Regional Budget and Program Reviews

The PM's are reviewed first in the Regional Bureaus up to the Assistant Administrator level, and then selected PM's are reviewed at the Administrator level. These country reviews are followed by an Administrator's review of each Regional Bureau's combined budget request, and finally by the worldwide budget rack-up.

Sept PBS (Project Budget Submission)

USAID missions submit, following the PM, this supporting document presenting project details and cost components.

Sept-Oct Submission of selected revised PM's to the Budget Bureau

Oct Submission of A.I.D. Budget to the Budget Bureau

Oct-Jan Revisions of A.I.D. Budget prior to President's budget message to Congress

Jan-Mar Congressional Presentation

Feb-Nov Congressional Authorization and Appropriations hearings

Jul Tentative OYB (Operational Year Budget)

This is a revision of the A.I.D. Budget as presented to Congress, based on an estimated appropriation and a reassessment of worldwide circumstances and needs. It permits essential operations to continue in the new fiscal year.

Jul-Nov Authorization Bill

Jul-Jan Appropriation Bill

Oct-Jan Final OYB

This is a firm operating budget, based on the final A.I.D. appropriation, which provides the authority for normal Agency operations. Amendments to the OYB are subsequently made throughout the fiscal year.

POLICY ANALYSIS IN A.I.D.

Senator JACKSON. First, let me thank you for a very fine statement. I have a few questions.

Have the PPB requirements for Program Memoranda and Special Analytic Studies resulted in new and helpful kinds of policy analysis for foreign affairs problems?

And in this connection, what important new approaches to foreign policy analysis are in prospect, in your judgment?

Mr. GAUD. I can't speak to that except as regards A.I.D. itself. I think that the essential point is that the PPB system as it has evolved with us forces us to concentrate more than we perhaps otherwise would on alternatives, and on costs, and gives us a much better picture of where we are going in the long run.

It is an extremely useful device as far as our developmental programs are concerned. It is particularly useful at a time like today when we are short on funds, where the number one job that we have, really, is to fix priorities.

It is very worthwhile in helping us to fix priorities.

As far as specifics are concerned, Curt, do you want to add anything to that?

Mr. FARRAR. One possible specific would be to focus more directly on trade-offs between PL 480 and dollar program assistance.

There have been instances where this type of issue has been raised more specifically and directly than might have happened previously because of the operation of the PPB system, with resultant saving in the program.

Senator JACKSON. Is there any specific country that you could refer to where the technique has been helpful as compared with past practices?

Mr. GAUD. I would say in all of the countries. It has been much more useful because it has given us a fuller and more comprehensive picture of the problems in the country, how to go about meeting them and what the cost of achieving your objectives would be.

I would say, Mr. Chairman, it has been helpful across-the-board. It has been very useful in dealing with the developmental aspects of our business.

Senator JACKSON. You are dealing with so many imponderables to start with that the task is a most difficult one. I gather you feel the system helps to provide some greater certainty in portions of this problem that you face?

Mr. GAUD. Right.

Senator JACKSON. Would you say PPB is an added tool that can help make certain aspects of the A.I.D. problems more precise and tangible? Beyond that, of course, there are the political and intangible aspects where judgment is the main requirement.

Mr. GAUD. Yes, sir.

Let me put it this way. The problem of what countries to provide aid to is essentially a political problem. A good many factors go into the decision of whether we will carry on an A.I.D. program in a given country.

How important is the country to the United States? How serious an effort is it making for development? Will it take the necessary self-help measures so that it is worth our providing aid? To what extent can it get funds or is it getting funds from other sources, such as France, Britain, the World Bank or what-have-you. What is the extent of the need?

But let us assume that we decide to go into Country A and carry on a development program. It is at that point, when that decision has been made, that PPBS comes into play.

What do we want to achieve in that country with the A.I.D. program? What are our objectives? What is the best way of reaching them? If, for example, in India, the primary objective is to increase food production, you make a study of the agricultural sector, the relationship of the agricultural sector to the other sectors, and decide what is the most effective way of meeting your overall objective.

This is the kind of analysis you do, once you make your decision to go ahead.

The PPBS will also be useful once you are in a country, deciding how far you are willing to go with that country. Are they making good use of their own resources and of the aid you are giving?

This, of course, is one of the principal subjects that will be discussed and revealed by the PPBS. And on the basis of your study, you may decide that there is no point in going ahead unless the country is prepared to do better, unless it will adopt certain reforms and different policies.

So, it is a check not only on the institution of your programs but also on the continuation of your programs.

Senator JACKSON. I gather that, as Administrator, you feel the system at least helps you to know what the options are.

Mr. GAUD. That is right.

Senator JACKSON. To perhaps make the alternatives a bit clearer than in the past?

Mr. GAUD. There is no question about it.

Senator JACKSON. I take it when you are dealing with development loans, let us say for the construction of a dam which is needed to provide for certain basic industries, the cost-benefit ratios can be determined quite accurately?

Mr. GAUD. That is right.

Senator JACKSON. The problem then arises, I take it, as to whether or not the dam should be built at all as it may relate to the long-term objectives set out by the Administration?

Mr. GAUD. That is right.

We have two different steps here that are involved before we go ahead with that dam.

First, you have the Program Memorandum which, let us assume, says that it makes sense to build certain kinds of dams in the country, to achieve certain objectives.

Then, as you point out, comes the question of whether we should build a dam in location A. That latter question is not disposed of or taken care of in the PPBS. Instead, as I suggested in my statement, we have a separate study on that prepared as a capital assistance paper.

For example, a month or so ago we made a loan to add to an existing fertilizer factory in India, the Trombay Fertilizer Factory. The program document for India established a clear priority for fertilizer manufacture. The loan paper itself covered the particular plant, its cost-benefit, its engineering, its economics, all aspects of that specific project.

We conduct a comparable study for every loan that we make. So the PPBS will not give you an ultimate program decision on whether you will make a certain loan or whether you will undertake a certain technical assistance project.

But it gets you down the road to the point where you know what kinds of things you want to do in the country and, roughly, the amount of aid that is reasonable and where it ought to be applied.

Senator JACKSON. If you elect to go that route, you have a pretty good idea what the costs are and what hopefully might be the benefits.

Mr. GAUD. That is right.

Senator JACKSON. You still have to determine your priorities, whether or not a project will fit into that kind of an economy and be useful and effective.

Mr. GAUD. Yes, sir.

BETTER ANALYSIS AND INFORMATION FOR CONGRESS?

Senator JACKSON. Do you think program budgeting, as it is operated in A.I.D., has provided Congress with better analysis and information than we have previously been given, as a basis for Congressional action on A.I.D. budgets?

I gather the biggest of all your problems in connection with the A.I.D. program is the Congress of the United States.

If you have any examples of improved analysis and information, they would be very useful.

Mr. GAUD. Indirectly, it has, in the sense that the proposals that we make to the Congress have a far better analysis and study behind them than they would without this very complicated programming and planning system.

But, if you are speaking about providing the Congress, itself, with more data—or better data—on which to judge the adequacy or inadequacy of our proposals, the answer is no.

Frankly, Mr. Chairman, that hasn't been the problem that I have worried about the most. My problem, from where I sit, is to get across to the Congress the basic elements of our program and not the sort of complicated studies and analysis that you find in the PPBS.

The Congress is extremely busy. The members have a great deal to do. Our hearings, particularly in the Senate, are apt to be very brief. There really isn't any occasion to get into the kind of analysis that the PPB system makes possible.

I would prefer if we could go into these matters in greater depth with the Congress. But as a practical matter, it isn't the question.

Senator JACKSON. The A.I.D. projects you really get into are generally the ones that go sour and that generate a lot of publicity. The Senators and the Congressmen tend to want to dig into that kind of project.

Mr. GAUD. That is correct.

THE MISUSE OF STATISTICS

Senator JACKSON. I do not know whether you had an opportunity to see the article that appeared in the Washington Post the other day, by Arthur M. Ross, who just retired as Commissioner of Labor Statistics, in which he commented on the misuse of statistics by government officials.

He gave this warning:

. . . statistics must be interpreted with greater skill and discretion. Administrators should not be permitted to confuse them with complex, elusive realities or regard them as significant entities in their own right.

. . . extreme care must be taken lest program budgeting become a Procrustean bed and cost-benefit analysis a crown of thorns. Specious quantification of the unquantifiable can be as mischievous as ignoring it. The peculiar genius of the human brain is that, unlike the present generation of computers, it can deal with qualitative issues in their own right.

. . . there is no substitute for the intuitive feel of a problem resulting from first-hand exposure to it. This is particularly true for people in Washington, a governmental company town insulated from much that goes on in the world.

Statistics are indispensable, but they cannot remedy the isolation from reality which has beset rulers in all times and places.

I wondered if you might have any comments on that warning. Without objection, I will put the entire article into the record. (The article referred to follows:)

[Washington Post, June 30, 1968]

Overblown Affinity for Numbers

ROSS HITS STATISTICS 'MIS-USE', SAYS OFFICIALS FOOL THEMSELVES

(By Arthur M. Ross, Former Commissioner of Labor Statistics)

(Having left the Government Friday to become a vice president of the University of Michigan, Ross responded to The Washington Post's invitation to set down his impressions after two years in office.)

The position of statistics in Washington is curiously ambivalent. On the one hand, the statistical agencies are starved for money and personnel. For the cost of few miles of interstate highway they could provide information potentially worth billions in terms of more intelligent policy choices. Unfortunately, as veteran budget officers like to say "statistics don't vote."

On the other hand, statistics have extraordinary prestige among men of affairs. Unlike the British, who appoint another Royal Commission when they wish to evade a problem, Americans launch another statistical survey.

Public men become known by the statistics they keep. Before he decided not to seek another term, the President was wont to regale his visitors with the latest opinion polls. His predecessor's attack on the Eisenhower administration was centered on statistical comparisons of economic growth and missile stockpiles. Many moons will pass before Robert McNamara lives down the image of a human computer. Sargent Shriver, while head of the OEO, would unfailingly report on the number of families "rescued from poverty."

VALUE OF STATISTICS

The distinguished secretary of HEW has gone so far as to assert that the chief statistician of the department and his staff "do more to determine future HEW programs than all the other officials in the department." (Up to now, however, Wilbur has stopped short of promoting himself to chief statistician.)

I, myself, coming from the obscurity of academic life, was startled to discover that I was "good copy" because I had jurisdiction over the figures on inflation, unemployment, etc. I obtained more mileage from stale and mediocre ideas, presumably backed with statistics, than I ever had derived from fresh and brilliant ideas when I was younger. To the amusement of my colleagues and the gratification of my wife, I was often described as "the nation's leading expert" on subjects where, in fact, I had little expertise. Because of a strong passion for anonymity, known best to my immediate superior, I strove manfully to keep my name out of the public print. It was, I confess, a losing struggle.

If this overblown affinity for statistics were only amusing, it would not deserve much comment in a city replete with absurdities. But the phenomenon has a more sober aspect. Government officials are prone to take statistics too literally, to ignore their limitations, and to confuse partial truths with the whole truth about complex realities. This propensity can lead to serious, even tragic, consequences.

D.C. ISSUES VAST

I think I can explain the peculiar function of statistics in the Washington milieu. The issues which come here are vast, intricate, ambiguous, intractable. Statistics enable us to grasp and describe these many-sided problems at the cost of heroic oversimplification. One or two dimensions, which happen to be measurable, serve as a shadow representation of something with numerous, perhaps innumerable, dimensions.

No harm is done if a quantitative measure is seen for what it really is. But trouble sets in when the statistical abstraction is confused with the more complex underlying reality. There are two principal dangers in this process. First,

immeasurable aspects of the problem may be vastly more important than the measurable. Second, the validity of a particular measure may have been undermined by economic and social changes.

Meanwhile, bemused by the appearance of objectivity and precision, the policy maker keeps his eye fixed on charts and tables which are sadly incomplete, increasingly obsolescent, or both. Eventually he comes to believe that poverty really is a condition of having less than \$3300 income; that war in Vietnam really is a matter of body counts and kill ratios; and that full employment really is a situation where the national unemployment rate is 4 per cent or less.

OFFICIALS FOOL THEMSELVES

This shadow replaces substance. The ultimate hazard is not that the officials fool the public, but that they fool themselves. After all, they are more inclined to swallow their own rhetoric than the public is.

I should like to dwell briefly on the three examples just noted.

Poverty.—Statistics tell us there is less poverty in America than ever before. The number of poor families has fallen from 8.3 million in 1960 to 5.2 million in 1967. OEO has said that we can look forward to the complete abolition of poverty by the year 1976. Imagine that—a country with no poverty: Truly an historic “first” in the history of social statistics.

With the poverty problem well on its way toward solution, no wonder Secretary Freeman was so irritated by the CBS documentary on “Hunger in America.” No wonder the government has been taken aback and caught unprepared by the increasing militancy of the poor. The shock becomes greater when it is realized that only one group among the poor, the urban Negroes, has yet become radicalized to any significant extent. Rural whites and Negroes, Mexican-Americans, Puerto Ricans, and Indians are still relatively apathetic.

The trouble is that the government claims to measure poverty by the number of families with incomes of less than \$3300 in current purchasing power, adjusted for differences in family size and urban or rural location. An income cutoff is a useful statistic for many purposes, but a terribly simple-minded definition of poverty. Poverty is shame, guilt and despair; lack of access to good schools or decent housing; being preyed on by criminals; and many other conditions not necessarily cured by family incomes over \$3300. Remember that the bulk of families in Harlem are “non-poor.”

Vietnam.—For many months we were winning the war in Vietnam—not as quickly as originally hoped, but steadily and inexorably. All the statistics told us so—the body counts, kill ratios, infiltration estimates, bombing data, captured weapons, content analysis of captured documents, and so on. Then it appeared we were not winning.

Is it a coincidence that the most elaborately measured war in American history is also the least successful?

I do not think so. On the contrary, the egregious abuse of statistics contributed directly and substantially to the outcome. Some of the statistics were pulled out of the air, it is true, and some of the interpretations were palpably absurd, e.g., the claim that 2,000,000 refugees had “voted for freedom with their feet.” But the major vice was the assumption that the basic elements in the war were those incidents of military might which could be counted, calculated, and computerized.

Had this calculus of force not yielded such ample and comforting food for thought, would it have been possible to disregard so flagrantly all the crucial factors which could not be computerized? Science has worked many wonders, but has not yet put history on the computer, nor ideology, religion, color, colonialism, nationalism, sectionalism, cynicism. Since these could not be quantified, they never found their way into the accounts.

Full Employment.—We have been enjoying full employment for two and a half years. We know this because a national unemployment rate of 4 per cent is the official definition of full employment. The rate has been running below 4 per cent except for a brief period in 1967, and currently stands at 3.5 per cent.

And yet it appears that the most important social problem is that of jobs. If we have full employment, how come we need more jobs?

The short answer is that rising expectations have rendered the old measures obsolete.

The full employment concept is related to the scope of the government's responsibility under the Employment Act. Until recently, full employment of primary breadwinners, especially married men, was viewed as the principal obligation. At an overall rate of 4 per cent, most married men do have jobs.

Today the bulk of unemployment is concentrated among women, teenagers, and unmarried men, and the responsibility is broadening to include them. Surely there is no need to belabor the importance of Negro unemployment, though it has only a marginal effect on the national rate.

This misuse of statistics leads to results ranging from the comical to the tragic. What practical lessons are to be learned?

First, of course, we need more and better statistics in order to illuminate the problems more adequately.

Second, statistics must be interpreted with greater skill and discretion. Administrators should not be permitted to confuse them with complex, elusive realities or regard them as significant entities in their own right.

Third, extreme care must be taken lest program budgeting become a Procrustean bed and cost-benefit analysis a crown of thorns. Specious quantification of the unquantifiable can be as mischievous as ignoring it. The peculiar genius of the human brain is that, unlike the present generation of computers, it can deal with qualitative issues in their own right.

Finally, there is no substitute for the intuitive feel of a problem resulting from first-hand exposure to it. This is particularly true for people in Washington, a governmental company town insulated from much that goes on in the world.

Statistics are indispensable, but they cannot remedy the isolation from reality which has beset rulers in all times and places.

Mr. GAUD. I certainly agree with Mr. Ross's warning.

I think that one of the dangers of any system is that it may become a Frankenstein and take over.

As far as the foreign affairs field is concerned, I would apply that specifically to us by saying that you must not let the technicians take over.

We talk about economic development as what we are trying to achieve. I consider that a short-hand term. It isn't economic development alone that we are after; we are after development in the broadest sense in these countries.

Political development and social development are just as important as economic development. If we ever got to the point in the aid business where we were making our decisions solely on technical economic grounds, whether as the result of a PPB system or for any other reason, we would be aiming at the wrong mark.

I suppose the simplest way to say it is the way several witnesses before this committee have already said it, that you have to consider this system, useful as it is, as a tool, and as one of the tools that you use in arriving at your decisions.

USEFULNESS OF PPB IN A.I.D.?

Senator JACKSON. As a lawyer and a very able lawyer, and as a very able Administrator, do you find that materials generated by the PPB system help to improve your ability to ask your subordinates the hard, tough questions that need to be asked?

Mr. GAUD. I don't think there is any question about it.

Senator JACKSON. Is this the most useful aspect of the whole system? Or is it one of the most useful?

Mr. GAUD. It is one of them. It throws up the issues. It frames the issues.

Having just spoken about the political side of this business and how important it is, I would like to say something which may seem contradictory to that, although I don't think it is.

Another virtue of programming and planning the way we go at

it is that it gives you the data on which to make a decision so that it doesn't have to be made in purely political terms.

So often in the aid business there is a struggle between short-term objectives and long-term objectives. Often we are urged to do something to achieve a short-term political purpose.

If you have a good programming and planning system, you can often use the material that it develops to show that it would be very foolish to take a step which may look great in terms of short-term political objective, as seen by a political officer in an embassy.

The system gives us a great deal of information that we can use to try to make this program hew to long-term development, and not get diverted—as is so often the danger—into short-term political objectives where your money is really going to be thrown away.

Senator JACKSON. This is a continuing problem that you have to face every day, I am sure.

Mr. GAUD. Yes, sir, it is.

But let me say also that in the seven years that I have been here, it has become much less of a problem than it used to be. There were many more occasions in 1961 and 1962 where, because of lack of familiarity with the way the other fellow did business, or lack of exposure, etc., there was a tussle between the State Department and A.I.D. on what ought to be done in a given situation.

Today, partly as a result of this setup I have described in my statement, we know a good deal more about the other fellow's business. We can understand the other fellow's problems a good deal more, and we have many fewer of these occasions than we used to have.

I think, myself, that without the planning and programming system that we have, without the data that it pinpoints, we would be in a much more vulnerable position and less able to handle these issues.

Senator JACKSON. You feel you are in a better position to confront the applicant, or whoever might be your adversary, with facts that were not readily available to you.

Mr. GAUD. That is correct.

Of course, another thing that this system helps with is in figuring out what self-help steps and what reforms the aid-receiving country should take in order to make aid more effective. This is also very basic in our business.

Senator JACKSON. Does the material produced in the PPB exercise also give you the clue as to how to convince aid-receiving countries that they should make those reforms?

Mr. GAUD. Yes. It is very helpful in that.

Senator JACKSON. I would think this aspect of your problem is the roughest of all. You know that they need to change some of their ways, but the techniques and the means by which you get them to see this are matters of judgment and good sense.

Mr. GAUD. That is correct.

But if you are dealing with a finance minister or a foreign minister who has a concept of development, who is committed to moving ahead, given the kind of analysis that we are trying to develop you can persuade him 9 times out of 10 that he ought to raise taxes or that he ought to increase customs, or that he ought to do something about his tax administration—always subject to his political situation.

Senator JACKSON. I shall defer my other questions. Senator Metcalf?

OVERALL FOREIGN AFFAIRS BUDGET CONTROL?

Senator METCALF. Mr. Chairman, I want to agree with you that Mr. Gaud has made a significant contribution to our country, our foreign affairs, and has been a superb administrator in a very significant and rather delicate area. I have nothing but admiration for the way in which he has conducted his office.

I think you have not only been dedicated, but you have made a great sacrifice in carrying out this job in the public interest for America.

Mr. GAUD. Thank you, sir.

Senator METCALF. I do want you to explain a little bit more about some of the things you developed in your statement. I think you have cogently persuaded me, at least, as to the value of this system as far as A.I.D. is concerned.

But you took issue with Dr. Schelling. I think perhaps what you took issue with was the statement in his memorandum:

The basic program package is not Peace Corps, financial aid, military aid, agricultural surpluses, propaganda, or diplomatic representation; the basic package is the country.

I wasn't persuaded by your statement that an extension of this whole budgeting system wouldn't be valuable in analyzing all of the U.S. programs in a given country in view of what we are trying to do.

You mentioned that PPB is only a tool. All these programs are only tools that we have available to try to accomplish an overall objective.

I wonder if you would elaborate on that criticism.

Mr. GAUD. I agree with Professor Schelling that the Government should look at each country in which it is operating as a package. The U.S. should have a single program, for any country in which it is carrying on any activities at all.

Where I go off the track with Professor Schelling is that he seems to feel that it would be desirable to achieve this by the kind of unified budget control that now exists in the Pentagon. I don't think that is desirable or necessary.

At the same time, some mechanics should exist whereby the Secretary of State can police the activities of all of us in the foreign affairs agencies to make sure that we are hewing to the foreign policy line.

But I don't think you have to have budgetary control to do that.

Senator METCALF. If you will permit me to interrupt, one of the strong points that has been brought out in the course of these hearings is that in the Pentagon and in some other areas, not only have we achieved better financial arrangements, but we have achieved closer and better control.

In your response to the Chairman, as far as your own agency is concerned, you suggested that this was a useful tool for control. Why doesn't that carry over to the Secretary of State?

Mr. GAUD. I think that this thing is particularly useful in the area of the Pentagon for two reasons:

One, the three Armed Services in many respects could do the same jobs. The Marines can do a lot of things that the Army can do; the Army can do a lot of things that the Air Force can do; and so on around the circle.

Going back to the days when I was in the Pentagon (and that

was some time ago) there has always been a problem on what are the roles and missions of the various services. There has been a good deal of duplication.

It seems to me that there is still some of that, although less than there used to be. I feel that the missions of A.I.D., of the Peace Corps, of USIA, of the State Department, of the Export-Import Bank, are so different that you don't have that degree of overlap.

So, it doesn't take as tight a control to make sure that they are not getting in each other's way and duplicating each other.

That is point number one.

Point number two: The question of whether you have this type of a missile—I am speaking from an abundance of ignorance on this subject—whether you have this or that kind of weapon, or this or that kind of truck, is in large part a budgetary question.

Senator METCALF. I don't think Senator McClellan would agree with you on that.

Mr. GAUD. He probably wouldn't, and I may well be wrong. But contrast that with the question of whether the USIA should carry on a certain program in India or whether A.I.D. should carry on or finance a certain loan there, or whether the Peace Corps should send another 50 volunteers there. It is pretty hard to make that decision in budgetary terms. I don't think that is a budgetary decision, really.

Relatively few of the decisions involving the question of whether this agency or another one should do something in the foreign affairs field are budgetary matters.

We have today in Latin America what we call a CASP, a Country Analysis and Strategy Paper. It is prepared under the direction of the State Department. It covers the entire foreign affairs field, and, in broad terms, is supposed to decide what our strategy is towards a particular country and what part each of the various foreign affairs agencies shall play.

Whether it's a CASP or something else, there should be a device to set our overall strategy toward a particular country and fix the roles of the various agencies. But to go beyond that and say that there should also be unified budgeting and programming, this is where I go off the track.

I think that we must be very sure that all of the foreign affairs agencies are hewing to the same line in terms of policy; that the State Department should have a clear say as to what each agency is going to do in a particular country.

But I don't think it is useful to go beyond that and have a unified budget and unified budget control. I say that first as a matter of principle. It doesn't seem to me it is necessary. I am not at all sure that it is desirable.

How would you achieve it? The State Department is clearly not up to doing that job today. You would have to create some kind of superstructure, whatever you want to call it, a Department of Defense in the foreign affairs field and superimpose it on top of all existing agencies.

I don't believe in complicating life any more than necessary. I think this would mean more jobs, more money spent, more bureaucracy, more regulation, more slowing down in getting our jobs done. I would rather spend my time trying to figure out a way whereby the Secretary

of State can perfect the policy control that he has over these agencies today.

I think the means of policy control is complete, as far as A.I.D. is concerned, as I elaborated in the last part of my statement. It is pretty good as far as the other agencies are concerned. But I would put my efforts into improving that, rather than setting up an elaborate, complicated, expensive, and top-heavy structure.

When I am saying this, I am not disparaging the Pentagon, because I think our job is entirely different from the Pentagon's job. I don't think the need is the same.

RISKS OF QUANTIFICATION

Senator METCALF. I am very grateful to you for that explanation. I think you have made a valid clarification and distinction.

I brought along with me the same article by Mr. Ross from which the Chairman quoted. I wanted to ask you about a couple of other things that Mr. Ross suggested. He pointed out, as Senator Jackson has indicated, that there were very great dangers in statistics.

You suggested you cut \$800 million out of the budget submissions—out of the proposed budget requests that came in from the field.

Mr. GAUD. Yes, sir.

Senator METCALF. With all this system of statistical analysis back here in Washington, how do policy makers keep from doing what Mr. Ross warns us against, becoming bemused by the apparent objectivity of charts and statistical tables and things of that sort?

Let me read to you another thing Mr. Ross said. He said:

For many months we were winning the war in Vietnam—not as quickly as originally hoped, but steadily and inexorably. All the statistics told us so—the body counts, kill ratios, infiltration estimates, bombing data, captured weapons, content analysis of captured documents, and so on. Then it appeared we were not winning.

Is it a coincidence that the most elaborately measured war in American history is also the least successful?

With the strong emphasis of PPB on quantification, how do you keep your people from being misled by what can be counted, calculated, and computerized? How do you avoid the danger that Mr. Ross has pointed out?

Mr. GAUD. I don't think we operate on statistics the way in which he is talking about them. Our PPBS, these planning and programming papers, include statistics on the country's economic growth. But essentially what they do is analyze how to get from here to there.

The statistics have a sole purpose in showing how to get where we want to go, how much it costs to go, and does it make sense to try to go from here to there or should we be going to some other place.

I hardly ever see a chart from one year's end to another. We don't run our business on the basis of performance statistics. That is not our system.

The purpose is to expose issues and to show what is the best way of doing something. Perhaps one reason why we might have less difficulty than you might have in some other areas is because everybody in A.I.D. is firmly committed to the proposition that development is a slow and lengthy process.

You don't look for results from this year to that. Some results,

yes, but not winning wars or getting a country to the point where it doesn't need aid next year. We look at this thing as a long-term process.

Furthermore, it seems to me that our decision as to how far we will go with a particular country, whether we will give it more or less aid next year than we did this year, putting aside the question of whether we have enough money to do it, depends so much more on policies than it does on specific facts. It depends on that country's political behavior and that country's economic performance in terms of policies that it is following or not following. I may be wrong, but I just don't see this as a problem with us.

Senator JACKSON. Would you yield right there?

To the extent you have indicators as a means of making an evaluation, I suppose you must have different indicators for each country.

Mr. GAUD. That is right.

Senator JACKSON. In other words, the objectives vary with each country and because of this there will be variation in the shorter term and longer range indicators that might give you a clue as to progress.

Mr. GAUD. Right.

In the countries in which we have our principal aid programs—development programs—most of the aid today goes by way of what we call a program loan, a non-project loan. The purpose of the loan is to finance the importation of commodities.

For example, in India and in Pakistan, it would be primarily fertilizer as well as such other things as raw materials and spare parts for their existing plant.

Each of these program loans in a given country will be conditioned on the recipient following certain policies and taking certain steps. In many cases the loan will be released in quarterly or semiannual installments.

Before each installment is paid, there is a joint review in which they and we participate to see whether they are living up to the conditions of the loan and are following the policies we have agreed upon.

The test, as you suggest, Mr. Chairman, isn't really so much a mathematical or statistical test; it is a question of whether they are taking the steps that they agreed to take with respect to land reform, with respect to their fiscal and monetary policy, with respect to devaluation, with respect to whatever it may be.

I don't know whether all of this answers your question or not.

Senator METCALF. This is very helpful, and I am glad to have an explanation of how these things occur.

Let me cite an example for you from our own domestic affairs, a recent one, in Wibaux County, Montana. A citizens' committee made a study of hunger in the United States. The committee relied heavily on statistics. The statisticians found what appeared to be a high rate of postneonatal mortality in Wibaux County, 19 per thousand. Well, if you reduce that sample down to size, it means that a baby, one baby, died in sparsely-settled Wibaux County. The reason for that death could be distance from the hospital. Statistically, though, one death appeared to be a high rate. And so the map prepared by the statisticians, which appeared in the *Washington Post*, showed that Wibaux County was an emergency hunger county—the

only county in eight western states in that category. So the Department of Agriculture sent a team in to find the hungry people and feed them. I made my own check into the situation, and so did others, and we haven't found anyone hungry there yet. I have asked the Department of Agriculture to put its people where they are needed, and I'm glad they have pulled out of Wibaux County.

And there is something else about that map the statisticians put together for that "Hunger USA" pamphlet. According to the map there isn't any emergency hunger situation in Harlem, in any part of New York, in fact nowhere in the entire Northeast. The reason of course is the reverse of the situation in Wibaux County. There are so many people in those seaboard areas that the hungry are swallowed up, statistically, by the well-fed majority.

It would seem to me that it would be even more difficult for you back here in Washington to analyze correctly reports from Africa or Southeast Asia, or some other foreign area, and to grasp what the statistics really mean. I would think you would have to work even harder to avoid the abuse of statistics in A.I.D. than we have to work to avoid their misuse in domestic policy.

Mr. GAUD. I think that is right.

Mr. FARRAR says he would like to add something to this.

Mr. FARRAR. I think we are very conscious of the fact that the numbers we use, and, of course, we use a great many of them, are generally pretty inaccurate, because of the lack of administrative superstructure in the country to provide them. We take an approach which is represented in a book called "Planning Without Facts" by Wolfgang F. Stolper. We realize that what we need is more information, more statistics, than we can possibly get.

We have to find means of building our programs without demanding facts that we know we cannot get. This consciousness, this suspicion of the quality of statistics, which pervades the agency both in Washington and overseas should protect us from a too automatic judgment based on statistical analysis.

Senator METCALF. Mr. Chairman, I don't want to completely dominate this discussion, and we have two of our other colleagues here. I will defer my other questions.

Senator JACKSON. Senator Baker.

PPBS AND INNOVATION

Senator BAKER. Thank you, Mr. Chairman.

Mr. Gaud, I never have really feared the intrinsic threat of PPBS or computerized analyses, any more than I fear the threat of laboratory chemistry of blood samples produced by a physician. I think the value or the mystique arises from the interpretation rather than the system. With that preparation I should like to ask two questions.

First, to what extent, in your judgment, does PPBS in your application lend itself to the encouragement of innovation, particularly the utilization of new technology rather than perpetuation of existing systems, concepts and approaches in the aid field?

Mr. GAUD. Well, I don't know. That is a difficult question to answer. I never thought of it before. I don't see any particular relationship, really.

Senator BAKER. The point that troubles me and prompts the question is the prospect that statistical, orderly, regular analyses of programs and results, which is the real essence of PPBS, lends itself to perpetuation of existing techniques rather than innovation, and rather than the incorporation of brand-new ideas or brand-new techniques for utilization in your program and other programs.

I think now of an example: The whole field of nuclear power, of nuclear desalting, of intensive agriculture and so-called food factory concepts and the like, has probably reached the stage of technical development and feasibility so that they are now labeled as an accomplished reality. I see very little effort to apply PPBS type tests to the desirability and utility of these newer ideas to A.I.D. programs and the like.

Mr. GAUD. I still don't see any real connection. In other words, as I said earlier, the PPBS doesn't tell you if you are going to build a particular power plant, at least the way we use it, or whether that power plant should be fueled by atomic energy, by coal or by oil, or by gas.

If the PPBS, and our planning and analyzing, suggests they need more power in East Pakistan, we then study it and come up with a loan paper which will consider the alternative sources of power.

Senator BAKER. If I can interrupt just a second to make the distinction, I think we are talking about two different things.

Mr. GAUD. Perhaps we are.

Senator BAKER. I agree that the exact application of new technology is not dictated by PPBS, as I understand it. However, take India as an example. The proposition of credits and loans to purchase fertilizer or spare parts for existing fertilizer plants is one concept which is thoroughly tested and understood within the terms of present procedures and techniques of A.I.D.

Yet, there is an entirely different approach to that problem, such as fixing atmospheric nitrogen by using very low-cost electricity to produce fertilizer for use in conjunction with intensive farming operations, including the farm factory concept, instead of trying to embellish and improve existing farm methods in India. They are two very different things.

What I am asking is whether or not PPBS tends to fix and rigidize our outlook toward existing methods rather than encouraging new, bolder, more venturesome techniques, as I think I described.

Mr. GAUD. It shouldn't. I don't see why it should.

Mr. FARRAR. In a sense the PPB system is empty. It will deal with whatever you put into it.

Senator BAKER. That is precisely right.

What I am trying to say, though I am not saying it very well, is that I think PPBS is a closed circuit system. It operates only on those things that you put into it, and I see no provision for putting new things into it.

Mr. GAUD. I just don't understand that because the PM originates in the field. It is prepared there by the program officer in the first instance with the advice of his division chiefs and technicians, and approved by the Mission Director and Ambassador. It comes back here and it is reviewed in Washington.

I would say that the question of whether we take new technology

into account adequately depends on whether we have good people in the agency who are administering the program.

Senator JACKSON. Good people who are using this tool?

Mr. GAUD. Yes.

Have we a guy in Pakistan or here in Washington who will raise the kind of question that you have just raised about fertilizer? I don't think the PPB system has anything to do with it one way or the other. It is a question of whether our people are up to snuff, it seems to me.

Senator BAKER. I think we go back to the original analogy I tried to make. It depends less on the system than on the ability of those who interpret the results. I think that is right.

I would suggest, however, that in the Defense Department, and in my limited observation of other areas of the utilization of PPBS, there is a tendency to deal with existing techniques and technology rather than a thorough incorporation of new or newer ideas in the system. I think we are now talking about the same thing, and I, too, think it is really a question of effective utilization of the system.

AVAILABILITY OF DATA TO CONGRESS

A second question, if I may, is this: I have put it to other witnesses in this series of hearings. Not particularly as it relates to A.I.D., but rather as it relates to the general relationship between the Congress and the Executive Department, and the total budget-making processes. I wonder if you would agree that it would be highly desirable to embellish the PPBS concept by mechanically and actually making available to the Congress the raw data that is available to the Executive Department in order to test and judge the budgetary recommendations that are sent to the President periodically as the Constitution requires.

I wonder if this wouldn't be an improvement of the PPB system as we now utilize it.

Mr. GAUD. In theory, I would agree with you. In practice, as I indicated a little while ago, I don't feel—and I hope you will understand the spirit in which I say this—I don't feel that the Congress is suffering today from being given too little information about our program or about how we arrive at our decisions. From where I sit, the problem is to get the Congress to look harder at the program than it does, and to deal with the material that we send up here now.

I don't feel that the great bulk of the material that we get—which we find useful and on which we spend a great deal of time—would help the Congress particularly.

For example, in Washington and in the field each year, we put roughly 179 man years of activity into preparing our Program Memoranda. These documents are very voluminous and are as complete as we can make them. To me, it is an absurdity to think that anybody in the Congress would have time to even look at them. I am doing my best to get the Congress to concentrate on the fundamentals of the A.I.D. program and I don't always feel I do very well at that.

Senator BAKER. I think your point is very well taken. Members of Congress simply don't have the time.

Mr. GAUD. They are too busy.

Senator BAKER. However, that doesn't negate the original concept. Let me give you another example.

Mr. GAUD. I agree with you in theory.

Senator BAKER. I receive about 18 pounds of printed material which is the administrative budget. I assign one or two staff people to review it. They are hard put to review even the superficial aspects of the budget.

Once again in the matter of utilizing new techniques, and to use a phrase I am not very fond of, methodology, it seems to me that we in Congress would be far better equipped to judge that budget or your program if we had computer access to the raw information on which you made your judgment so that particular items within the budget could be tested in the same manner.

Now, an extension of the same theory would be since Congress—which is extremely stingy with itself in the matter of staffing—is required to function as a branch of the Government and make an intelligent consideration of your proposals, substantial, even lavish, additional staffing and machinery are required which would interconnect and tie to the PPBS concept with the appropriate hardware to utilize it.

Would you agree with that general theory?

Mr. GAUD. Yes; certainly. I don't know whether there is a misunderstanding here or not, but, you know, none of this stuff is on computers.

Senator BAKER. No. I think it should be, though. I don't think all of it should be. I don't think you could get a computer print-out of a particular PM in your case, but I do think that certain cardinal features of the program, certain cost breakdowns which are vital to an intelligent evaluation of the programs, should be stored in a memory bank that gives access to both your Department and to the appropriate committees of the Congress.

Thank you, Mr. Chairman.

Senator JACKSON. Senator Mundt?

VALUE AND LIMITS OF PPB IN A.I.D.

Senator MUNDT. I have had the privilege of listening to Mr. Gaud on two other committees on which I serve.

Foreign aid is a very complicated problem. Mr. Gaud has done his best, certainly, to keep us acquainted on the Appropriations Committee and the Foreign Relations Committee, with answers to any question we can conceivably ask.

I don't see how PPBS can be of any great value, if you tried to expand it widely in A.I.D. matters, considering the difficulties involved.

I am intrigued with one statement you made. You said:

PPBS has been very helpful in clarifying some of the decisions we make, and of little use in others.

Forget about the little use, but would you name two or three of the major decisions in which you have received very definite help from the PPBS?

Mr. GAUD. Yes, sir.

In deciding on the composition of our major development programs, we rely on the Program Memorandum and the analysis that it contains on the amount of aid we should give to a particular country and

the kind of aid we should give to a country. Also, this analysis helps in deciding what policies we should urge a particular country to adopt as the condition of receiving aid from us.

Senator MUNDT. Will you particularize, give us the specific instances of two or three major decisions on which PPBS has been very helpful?

Mr. GAUD. Surely.

When we consider, for example, whether we should give a program or commodity loan to Brazil, we ask: (a) should we give it; (b) how large should it be? This depends on a number of factors. What is their foreign exchange picture? How well are they handling their own resources? What are their import needs?

A whole host of factors of this sort go into that decision. The analysis of the Program Memorandum gives us the data we need to make our decision.

Take Chile. As you know, one of the primary factors in Chile is the copper situation. This is a key element in deciding whether and to what extent we should give aid to Chile. What are Chile's anticipated receipts from copper over the next two or three years? What is the price of copper likely to be? Do they need any aid at all from us, given the situation of the copper market?

This kind of an issue is discussed in the PM and it leads to a conclusion for us.

Senator MUNDT. In other words, the data that you use in terms of economics and statistics about material things can be helpfully produced by PPBS?

Mr. GAUD. Right.

Senator MUNDT. And it could not be very helpful in developing the human equation?

Mr. GAUD. No, sir. It is of no value in your political situations as to whether you should give aid or whether you should stop giving aid for other than economic reasons. It certainly is not of much value in carrying out Title IX programs, institutional development, and the like. It has a limited usefulness.

Senator MUNDT. The other than economic reasons, it seems to me, in most instances have to predominate, for example, in such cases as famine or flood.

Mr. GAUD. This is right.

Senator MUNDT. The needs of the world are vast. We simply can't start out on the basis of whether a computer can kick up an economic need. In the major decision-making area, you finally have to decide whether to go or not to go, and PPBS would not be very helpful.

Mr. GAUD. That is right.

To oversimplify it somewhat, Senator Mundt, let me say that PPBS would be of no value if you were deciding whether you wanted to give aid to a particular country—apart from looking at the question of whether the country was following sensible policies. It would be of no value in helping you to decide whether that country's posture and relationship to the United States were such that you wanted to give aid to it.

But, once you make a decision to give aid to a country, PPBS is very useful in telling you how you might achieve your objectives, what the costs will be, and what the alternatives will be. It doesn't make the basic decisions either in the beginning or in the end. It is only a tool

that you use in some instances. You couldn't possibly build a sensible aid program on PPBS alone.

Senator MUNDT. I can see how it might sometimes eliminate from consideration some application which you might otherwise be considering because you have a persuasive applicant who comes here with tears in his eyes and a tin cup in his hand and makes an emotional appeal. After you take the tears out of the tin cup and looked at the economic situation, you might say that conditions there are not as bad as they are some place else.

Mr. GAUD. That is right.

Senator MUNDT. In that instance, you could minimize the problem you are surveying.

Mr. GAUD. Yes.

For example, to give you another illustration of the value as we see it of the PPBS, we have been working with Korea and Turkey for quite a long time. They are both doing well. Our analysis a couple of years ago indicated to us that if they stick to their last and continue to follow sensible policies, there is no reason why they shouldn't be free of the need for aid on concessional terms by early in the 1970s. This was indicated by our analysis in our Program Memoranda.

So, we then went to both countries and said, "Look, gentlemen, this is the way we see it. This is what we think you ought to be planning for."

In both instances, as you know, from one of the other committees in which we work together, both of these countries have announced to their people that it is their policy, their plan, their program and their hope to be through with aid by the early seventies.

Now they may or may not make it. But the point is they are working toward it. If we were just going along on a day-to-day or year-by-year basis, we would never figure that out.

USE OF COMPUTERS

Senator MUNDT. To what extent do you rely on computerized information?

Mr. GAUD. We don't very much for this purpose, Senator. Perhaps Mr. FARRAR can amplify this.

Mr. FARRAR. Of course most of our accounting system is automated so that data on expenditures, pipeline, obligations and the like used in our PM's and in the reviews comes from computers.

In a few cases we use computers in connection with econometric models to make projections of the longer range consequences of various aid input or economic policy choices. Finally, we are planning to make greater use of automated data processing for information retrieval, for putting the vast amount of data available to us into a form more easily used in the PPBS and other aspects of Agency management.

SIZE AND NATURE OF PPB STAFF IN A.I.D.

Senator MUNDT. Do you have a PPBS operational staff of your own or do you work through a PPBS operation set up in the State Department, or even through a broader interdepartmental one?

Mr. GAUD. It is entirely in A.I.D., Senator Mundt. The State Department participates in the reviews of the Program Memoranda. To

begin with, the Ambassador and his staff in the field participate in the preparation of the Program Memoranda. The Ambassador has to approve it before it comes here. The working staff in the field is my staff. When it gets back here and the memorandum is reviewed first in the region and then ultimately by me, the State Department participates in all of these reviews. But the staff that handles the document, that prepares the document, is an A.I.D. staff entirely.

Senator MUNDT. How many people would you say you would have, of your entire operation staff, involved in your PPBS operation?

Mr. GAUD. We reckon that there are some 77 people who work on PPBS here in Washington, either full or part-time. When I say "part-time", I am defining that as meaning that at least 25 per cent of their time is spent on the PPBS exercise. If you convert the part-timers into full-time equivalents, it works out to about 33 man years in Washington.

Overseas, where these Program Memoranda are prepared in the first instance, we have 301 people working on PPBS either full or part time, and if we convert this to full-time equivalents, it is roughly 146 man years of activity overseas.

So, putting the two together, it is a total of 179 man years of activity on the PPBS, both in Washington and abroad.

Senator MUNDT. What kind of people are they? Are they economists? Are they lawyers? Are they accountants? Are they career diplomats, political appointees? What are they?

Mr. GAUD. They are mainly economists, but there are a lot of other technicians as well.

Senator MUNDT. Are they economists who were teaching in universities or are they practical advisors who advise you?

Mr. GAUD. Well, economists, I guess, are pretty much like other people. They differ.

Senator MUNDT. They surely do. That is what I want to find out.

Mr. GAUD. Some of them are permanent civil service employees or Foreign Service Reserve officers, A.I.D. Foreign Service Reserve officers. Some of them are people who come in from the outside from a university or from a foundation and spend two, three, or four years, with the Agency. Some of them are youngsters who have just received their degrees and come to us as management interns and may or may not stay with the Agency.

But, in addition to economics, the Program Memorandum will cover such subjects as agriculture, education, health, public safety, public administration, labor. So, there are all kinds of people in addition to economists who work on these. But most of our program officers who prepare these documents have an economics background.

If I can add something—I adverted to this very briefly earlier—an important point to keep in mind is that while economists and other technicians prepare and work on these documents they don't make the ultimate decisions. The ultimate decisions as to what the program shall be are made in the field by the Mission Director, with the advice, assistance, and approval, of the Ambassador. These are men with many backgrounds. And then back here in Washington the decisions are made by the Assistant Administrators and by me—again in very close consultation with the State Department.

So it isn't, and in my judgment it shouldn't be, the technicians or

specialists who make the ultimate decision as to what the program shall be.

Senator MUNDT. The reason I asked the question is it seems to me that it would probably be very difficult to get, but what you would need to have, in the main, are, for want of a better name, what I would call private sector economists, the kind of hard-headed guys who can examine the whole economic situation, not in terms only of the needs and the planning, but the economic factors involved in getting our money's worth.

I recall an experience you had with Williams and Mundt who examined one of the economic operations. When the deficiency was called to your attention, you promptly corrected it. I would think in your shop it would be important to have economists recruited from the private sector, whose job it is to look for those deficiencies; as well as efficiencies. I think they may be hard to get. That is why I asked if they were theoretical economists. I think a lot of economic professors I have had in college could go all through a career in A.I.D. and never come up with what Williams and Mundt found and asked you questions about.

Mr. GAUD. Without disagreeing with anything you have said, because I don't, I think it is important to bear in mind that there are three separate phases of our operations, if they are to be properly conducted.

One is programming, and the PPB system is very important in terms of our programming, as I have said.

Next is implementation, good management.

Third is evaluation.

All the programming can do is to get you started. You have to have just as effective management as you can get for your implementation to make sure that you make as few mistakes as possible, and that you stick to sensible policies and procedures in carrying out your program.

Finally, you should have, and we do have, an evaluation system whereby, as you suggest, you are constantly looking at your operations, both at the programming operation and at implementation and procedures, to see that you are doing as effective a job as possible.

It takes all three of these to make a sensible operation: Programming, implementation and evaluation. You can't look, and you shouldn't look, at the programming business as being the whole answer to it. The other two are equally important.

Senator MUNDT. Mr. Chairman, for one who started out to ask a single question, I have taken enough time.

Senator JACKSON. Just one follow-up question, Mr. Gaud.

What increase in staff has taken place as a result of the assignment of the economists to carry on the PPBS part of the operation?

Mr. GAUD. I would say there have been almost no additions to our staff as a result of this, Mr. Chairman. The PPBS, if you are using the term literally, of course, was applied in 1965. By that time, as I have said in my statement, we had a very similar programming system already in being.

Senator JACKSON. Certain aspects of the program, of course, have been going on for many years.

Mr. GAUD. That is right. I have said that there are roughly 179

man years spent on PPBS. It would be almost impossible for me to say how much our analytical staff has grown over the years.

With respect to the Agency as a whole, except for Vietnam, our staff has decreased over the years.

If you start with the proposition that ever since 1961 we have been preparing country programs for the countries we are in, we have really been doing this kind of thing for quite a while.

Senator JACKSON. How many people would you designate in 1962 in this category and how many would you designate now?

Mr. GAUD. Perhaps I could supply that for the record. I couldn't say offhand.

(The material referred to follows:)

COMPARISON: Man-years spent on PPBS or equivalent activities in A.I.D. in 1962 and in 1968

There is a difficult problem of definition in determining who was doing PPBS-type analysis in 1962. Therefore, the figures below represent rough estimates based on a review of staffing patterns for that period.

	<u>1962</u>	<u>1968</u>
<u>A.I.D./Washington</u>		
Total number of people	72	77
Equivalent man-years	32	33
<u>Field</u>		
Total number of people	275	301
Equivalent man-years	115	146
<u>Total A.I.D.</u>		
Total number of people	347	378
Equivalent man-years	147	179

The increase from 1962 to 1968 is primarily due to an increase in analytical staff in the field.

PPB AND THE ROLE OF ADMINISTRATOR

Senator JACKSON. I think Senator Mundt has laid the foundation for the next interrogator, the Chairman of the Economics Department at Oberlin, Professor Tufts! Professor Tufts, you may proceed.

Dr. TUFTS. I would like to call your attention, Mr. Gaud, to an early passage in Mr. Schelling's memorandum, which I believe you have read.

Mr. GAUD. Yes.

Dr. TUFTS. He makes an analogy with a courtroom adversary proceeding. He says:

Systems analysis and other modern techniques of evaluation require a consumer, some responsible person or body that wants an orderly technique for bringing judgment to bear on a decision. PPBS works best for an aggressive master; and where there is no master, or where the master wants the machinery

to produce his decisions without his own participation, the value of PPBS is likely to be modest and, depending on the people, may even be negative.

I am curious as to who the consumers are in A.I.D. Do you, yourself, spend a good deal of your time studying the Program Memoranda that are submitted and so on? Do they serve a function at your level? Or is it mainly in the lower echelons?

Mr. GAUD. I spend very little time studying the Program Memoranda, as such. They come in from the field and are reviewed extensively and exhaustively, first at the regional level by the Assistant Administrator in charge of Near East and South Asia, Africa, or one of our other regions. He and his staff and the representatives of all interested agencies review them.

That review is attended by people from my central program office who represent me, so to speak; other central staff; and by the Bureau of the Budget. As a result of that review, issues are framed which are presented at a hearing which I hold. This review is likewise attended by the regional people, by the Bureau of the Budget, by my central staff, and by representatives of outside agencies.

So, I do not review the country program as a whole. I only deal with the issues that are identified by the earlier regional review. Then, in turn, as a result of this, I make my program submission to the Bureau of the Budget. This is a rather lengthy document and sets forth the issues and the alternatives with respect to the particular countries. So, I would say that the consumer here is first me and second the Bureau of the Budget.

Dr. TUFTS. That interests me because you say you don't spend much time studying the documents yourself.

Mr. GAUD. No; I don't. A complete Program Memorandum for one country may consist of three volumes. We have them for a great many countries.

Frankly, I couldn't sit down and study all those documents in detail any more than I could expect a member of the Congress to do so, if I may be so irreverent as to compare myself to a member of the Congress. I rely on my staff in this matter as I do in many other matters. I deal with the issues which come up from the reviews held at the regional level.

Dr. TUFTS. That is exactly the point I wanted to get to.

It seems to me that as an administrator one of your principal problems must be to insure that the right issues are raised.

Mr. GAUD. Right.

Dr. TUFTS. What sort of insurance do you have that Program Memoranda are raising the right issues? To what extent do you feed into the process the questions that occur to you as being key questions on which analysis is needed?

Mr. GAUD. There is no simple answer to that. I suppose one partial answer is that I have now been with the Agency since 1961 and I have some feel for most of the countries which we are doing business in. I have seen the programs evolving over a period of years. God knows, I don't always ask the right questions, but at any rate I have some notion of what most of the issues are in the particular countries.

In addition to that, on these reviews at the lower level, to begin with I have picked the regional administrator. I have confidence in him.

I have picked him as a man to whom I feel I can delegate responsibility. That is why he is there. He wouldn't be there if I didn't have confidence in him.

So to some extent I rely on him and, in turn, on his staff. In addition to that, as I say, my central staff takes part in this review, Mr. Farrar or someone from his staff. The Bureau of the Budget is there. The White House staff is there. The Department of Agriculture is there to look at agricultural questions. The Treasury is there to look at fiscal and monetary questions. Health, Education, and Welfare is there if we are carrying on a health program. The Department of Labor is there if there is a labor program in the country, and so forth.

So there are quite a lot of people who are involved in this review, many of whom have axes to grind. They are often conflicting axes.

In addition to that, the review will be attended not only by the central program people, but, in addition, by people on the central A.I.D. staff, identified with me rather than with the regions, who deal with agriculture, education, health, labor, public safety, and public administration. They, representatives of mine, also participate in these reviews.

Incidentally, we bring in people from the field who prepared the Program Memorandum to participate in the reviews. They participate not only in the regional review but in the review I conduct.

So, you have the field, you have the regional people, you have the central staff people, you have the State Department, you have the other functional agencies such as Agriculture and Treasury.

Dr. TURTS. You used the word "review".

What I am trying to get at is whether you have devised some way of inserting your own views or the views of your close associates into the process that originates, I suppose, from the country team, in such a way that the paper that comes up for review will have considered the issues that you think may be important.

Mr. GAUD. I didn't start far enough back.

The whole process starts with a directive which goes to the field from here, setting priorities and telling them in general terms how to prepare the Program Memorandum, what they are to look at, so forth and so on. That guidance embodies the fundamental policy which they are supposed to follow.

For example, three or four years ago the President decided and announced that the first priority in the A.I.D. program was to go to agriculture, education and health. So, for that year, and I guess the year after, this was immediately embodied in the directive which went out to the field missions.

In 1966, when I became Administrator, I thought that our focus should be sharper than that; it should be on increasing food production and on family planning. I established those as the first priorities in the Agency. So, the directive which went out to the field prior to the preparation of the Program Memorandum said, "Gentlemen, these are our first priorities, and you will have a section in your Program Memorandum dealing with these particular subjects."

So we start with that directive. Obviously, my own staff tries to see that these directives are carried out. When we have the reviews in Washington, certainly when I have my review, I have a check list of things with respect to the overall program and with respect to par-

ticular countries that I go into and see to what extent they have or have not been covered.

I would think, given the size and complexity of the operation, that between the original directive and the review system I get a reasonably good shot at it.

Dr. TUFTS. I suppose you would have done this whether we had anything called PPBS or not.

Mr. GAUD. We were, in effect, doing something like it before.

Dr. TUFTS. You were putting your priorities on agriculture and so on.

Mr. GAUD. The priorities were not thrown up by the PPB system.

Dr. TUFTS. To what extent has the introduction of PPBS modified in any way this aspect of your task as an Administrator? Has it helped you in some way in introducing these issues or in getting the reports from the field that you need?

Mr. GAUD. Not really, because we were following essentially the same system before. It was somewhat less elaborate. We were essentially following the system before with our country assistance programs. We had the cable of guidance or the airgram of guidance; the preparation in the field; and the reviews back here.

When I came with the Agency in 1961, the reviews were more sketchy than they are today. The papers which came in from the field were far more sketchy. I think we knew a good deal less about the job we were trying to do. We weren't so clear on what our priorities were. We had more money than we do today, and we didn't have to be so tight on our priorities.

But between the improvements in the planning and programming system, and the cuts we have been getting from the Congress—plus the fact that we have learned more about the development business—I think we have improved the quality of the work very considerably.

Senator MUNDT. I think what he is saying, Doctor, is that the energetic activities of the Appropriations Committee which reviews the requests and the analysis in the Foreign Relations Committee, has had quite more of an impact on the program than PPBS.

Mr. GAUD. I would agree with that. More impact than anything else.

PPB AND PERFORMANCE EVALUATION

Dr. TUFTS. One of the points that the President made when he introduced this system throughout the Government, in fact the last point, was that the system was to measure the performance of our programs to insure a dollar's worth of service for each dollar spent.

We haven't said much this morning about the program evaluation. You did introduce it in response to one of Senator Mundt's questions.

I noted that you concluded your prepared statement with a reference to the submission of the proposed A.I.D. budget to SIG for discussion, review and recommendation before it was presented to the Budget Bureau.

Mr. GAUD. Yes.

Dr. TUFTS. Did the PPB system produce evaluations that were useful in this SIG review and that were helpful to you also in making your decisions on the A.I.D. budget?

Mr. GAUD. If I understand your question, sir, the PPB system

certainly helped us decide in many instances what we wanted to do in particular countries and helped us decide what a sensible program in a particular country would consist of.

I think it improved the quality of the program, improved the quality of our budget, and thereby improved the quality of the submission that we made to SIG. The SIG members themselves didn't get into the details of the PPBS submissions, but there were a great many discussions of alternatives in the SIG, largely from what you might call a political standpoint.

Would it be better to put more money into Africa or more money into India and Pakistan? Should we give a still greater priority to the Alliance for Progress than it already has? Should we be concentrating more on public safety programs, police programs, than we are?

There was a great deal of discussion of the connection between the economic aid program and the military program and the military sales program. It was primarily these larger issues that were discussed in the SIG.

Dr. Tufts. In answering questions of the sort you indicated, the answers would depend to some extent on evaluation of what had been accomplished in Africa and what had been accomplished in India and Pakistan.

Mr. GAUD. That is right.

Dr. Tufts. And what police programs had done to help maintain order in Latin America.

Mr. GAUD. Yes, sir.

Dr. Tufts. Has PPBS, this approach, helped you significantly in attaining better evaluations of what you have been able to accomplish and thus contribute to your own review and to SIG review?

Mr. GAUD. I think so.

Dr. Tufts. I think that is all.

Senator JACKSON. Professor Farber, you may proceed with the questioning.

QUALITY OF THE PROGRAM MEMORANDA

Dr. FARBER. I have a few questions, too, with respect to the Program Memoranda.

It seems to me the quality of the Program Memoranda is crucial to the success of the PPB system. I would like to follow through on one of Senator Baker's questions.

To what extent are innovative ideas encouraged in the Program Memoranda; or, are new ideas fed in better from other sources? I am thinking in terms of the alternatives to reach objectives. Is this a method whereby people in the field can feed in new ways of doing things?

Mr. GAUD. It is supposed to be.

Dr. FARBER. Are the functional specialists encouraged to contact the PPBS unit in the Mission relative to alternative ways of reaching objectives?

Mr. FARRAR. It is always a problem to describe valid alternatives that represent a real choice and are not just straw men that can easily be knocked down.

I think in some Program Memoranda that we reviewed last year we did have some really valid alternatives, particularly those relating

the possibilities for overall economic growth in the country to the level of general economic assistance, where there was a real choice that could be made.

I think, frankly, a good deal depends on the personality of the Mission Director and the program staff in terms of the degree to which they seek innovative suggestions.

Dr. FARBER. Is there a great unevenness in the quality of the Program Memoranda?

Mr. GAUD. There is certainly some.

One of the things that we lack most is enough really top-notch program officers who, of course, make a large part of the input into a Program Memorandum. You do get some unevenness. Our staff varies in quality from Mission to Mission.

If I may go back to the question you asked a minute ago about innovation, I wouldn't want to leave the impression that we rely entirely on a mechanical process of preparing the Program Memorandum for our ideas. We have technicians in the field. We also have staff here in Washington in the various technical fields. There is a great deal of interchange of personnel. There are temporary duty assignments and various visits by Washington staff.

For example, two of the fields we are most interested in today are family planning and nutrition. There aren't many family planning people anywhere. I am not talking only about in A.I.D., but worldwide there aren't many people who are trained in this field.

If we relied on our Missions to come up with imaginative programs in family planning, we wouldn't get very many. So we have to rely very largely on our people here in Washington. We send them out to the various Missions. We have them work on the particularly important countries making an input into the program for those countries.

The same thing is true in the nutrition field, which is an area where we are trying to stimulate more activity. We don't have nutrition experts in many of our Missions. But we have a number of people here at home who are experts in this field.

So it isn't just a matter of the PM coming in from the field containing whatever contributions can be made by the people there. In addition to the original cable of guidance which we send out, all through the year there will be contacts with people from Washington who can make contributions that will show up in the PM.

In addition to this, of course, we very often send special survey teams out to a particular country, in agriculture, nutrition, family planning, or other fields. These teams are made up partly of people from the private sector, partly of people from universities, partly of people from A.I.D. or from other Government agencies. It depends on the job to be done, whom we can get and who is qualified to do it.

So, again, a large part of the input in a particular Program Memorandum may come as a result of a special survey done by a group that is sent out to the field for the specific purpose of ginning up a better program in that country in a particular area.

Dr. FARBER. You make certain, then, that the PPBS people have access to high level conferences that might take place in the area, and there is a feed down as well as up in this process?

Mr. GAUD. This we try to do; yes.

Dr. FARBER. I was thinking about the kind of studies that might be made by consultative groups or consortia here in Washington. That material would be fed down so that in the field they would be operating in the light of the over-all picture.

Mr. GAUD. That is right.

Mr. FARRAR. If I might add one thing, as we review each Program Memorandum each year, we in the Washington staff look specifically at the question of what special studies are suggested by this program and make recommendations back to the field for particular sectors that seem to warrant more work, with the idea of innovation in mind.

SIZE OF THE PROGRAM MEMORANDA

Dr. FARBER. I have just one final question: I was a little surprised at your reference to the size of the Program Memorandum in the light of the Budget Bureau guidelines stating they should not exceed 20 pages. Has this requirement been changed?

Mr. GAUD. I wasn't familiar with that. We certainly don't follow it. I will tell you that.

Mr. FARRAR. There is a question of the letter and the spirit, I think. The Program Memorandum proper for Korea consists of 23 pages.

Dr. FARBER. The rest is appendices?

Mr. FARRAR. Yes. It is a question of whether you have really read the Program Memorandum when you have read the 23 pages. But the essence of each Program Memorandum is contained in a short statement that does try to focus, as Mr. Gaud said, on the issues that need to be considered.

Dr. FARBER. Thank you.

MORE PERSUASIVE ANALYSIS FOR CONGRESS?

Dr. TUFTS. I have had on my mind the issue implicit in Senator Jackson's questions and Senator Baker's questions, and some others, namely, your big problem of how do you persuade the Congress that the appropriations you request are really justified by the benefits the country would obtain from Congressional approval of those requests? I take it, it is pretty obvious, that the Executive Branch is persuaded by the analysis it makes or gets that substantially larger funds for economic aid would indeed be justified. Yet, somehow, year after year, the Executive Branch does not persuade the Congress that that is so.

You said that you have trouble getting the Congress to concentrate on the fundamentals. In a real sense, isn't the heart of the PPBS an effort to relate costs and benefits? And shouldn't there be something more that you can do in making use of this material that piles up to a considerable volume to present to the Congress information that would relate to costs and benefits in a way that might be helpful to you in getting what you think is needed and justified?

I am really not persuaded, I guess, that it wouldn't be desirable to provide more helpful information to the Congress. Even if Senators and Congressmen cannot read all the material, I wonder if it wouldn't be desirable to present the sort of things that are persuasive to you. If they are persuasive to you, why wouldn't they be persuasive to the Congress?

Mr. GAUD. I am entirely in agreement with you as a matter of theory. But I am not sure that as a matter of practice anything would come of it.

Senator JACKSON. In closing, and on the lighter side, I want to call your attention to an example of quantification in foreign affairs, and I would like to get your reaction to it.

An American diplomat recently resigned from his official post and, upon departing, summarized his three years of service, as follows:

- held 1,204 appointments with individual ambassadors;
- participated in 232 consultations among various groups;
- attended 173 meetings of an international council;
- participated in 47 resolutions adopted by that council;
- attended 94 plenary meetings of an international assembly;
- participated in 343 resolutions of that assembly;
- delivered 215 policy statements;
- attended 776 receptions held by other envoys;
- spent 168 days in consultations in Washington;
- held 303 meetings of his own staff;
- hosted 235 diplomatic functions attended by a total of 16,094 guests.

Mr. Gaud, what is your reaction to this example of the quantitative approach?

Mr. GAUD. The same concern that Senator Metcalf expressed to me a little while ago. My!

Senator JACKSON. In conclusion, let me voice my appreciation and that of every member of the committee for your excellent presentation and your participation in this continuing study of ours. You have been most helpful. I want to congratulate, commend and commiserate with you.

Mr. GAUD. Thank you.

Senator JACKSON. As part of our review of planning-programming-budgeting in the foreign affairs field, we requested a memorandum or letter from the State Department, USIA, and the Peace Corps on the status of the application of PPB in those departments or agencies and on the main limitations, values, and problems in using PPBS in decision-making. We suggested that we would welcome an evaluation of the kind of program and policy analysis that is most useful to top-level policy-makers in dealing with problems in those departments and agencies.

Without objection, I would like to include in the record of this hearing the responses received by the subcommittee to these requests.

In addition, without objection we will place in the record a memorandum prepared on our invitation by U. Alexis Johnson, U.S. Ambassador to Japan, giving his views from the perspective of an ambassador in the field on the application of the PPBS to foreign affairs agencies.

Thank you again.

(Whereupon, at 12:20 p.m., the subcommittee recessed, to reconvene at the call of the Chair.)

PPBS AND FOREIGN AFFAIRS DECISION-MAKING

(Letter from Nicholas deB. Katzenbach, Under Secretary of State)

THE UNDER SECRETARY OF STATE,
Washington, July 15, 1968.

HON. HENRY M. JACKSON,
Chairman, Subcommittee on National Security and International Operations, Committee on Government Operations, U.S. Senate.

DEAR SENATOR JACKSON: The Secretary and I appreciate this opportunity to provide you and your Subcommittee with an evaluation of the relationship between planning-programming-budgeting (PPB) and the foreign affairs decision-making process. This is a subject in which I have been deeply involved since I came to the State Department almost two years ago, and many of the comments which follow are based on my own experiences with PPB over that period.

As you will see, the major thrust of my comments will indicate that I believe we need more systematic analysis of:

—the factors (including costs) upon which policy decisions are based;

—alternative courses of action and their possible consequences.

But I do not argue that when we have found a method of improving our analysis we will, thereby, have changed the world we live in. Foreign affairs is inherently an area in which there are few absolutes and many variables. It is a field in which the measurable and quantifiable can seldom be the determining elements of a decision.

Objectives

Somehow the very simple and clear ideas announced by the President in August of 1965 have been obscured by misunderstanding and bureaucratic excesses. I want, therefore, to begin by recalling exactly what it was the President directed. He ordered each Department and Agency to:

—identify national goals precisely;
—choose the most urgent from among those identified;
—search for alternative means of reaching those goals more effectively at least cost;

—determine accurately both the short and long term cost implications of the choice between alternatives; and

—measure the performance of programs in terms of objectives attained.

Our success in using PPB techniques will depend on staying as close to these concepts as possible. They are after all, what we should insist upon in any well-staffed analysis of a problem for decision.

Admittedly, PPB techniques lend themselves more readily to those areas of foreign affairs that are most amenable to quantification. But they can help us arrive at a:

—better and clearer definition of our objectives;
—much more systematic analysis of priorities (getting people to put down on paper some of their often unstated assumptions);

—better interagency policy control and coordination (by looking at all U.S. Government programs across-the-board in particular countries or areas); and

—check on past performance (by relating programs back to our objectives and then testing the validity of those objectives).

Our purpose, therefore, in examining these and other techniques is to find ways to raise issues for decision in a timely and explicit fashion, and to present alternative courses of action for decision up to the Presidential level. We also want to find ways to relate and evaluate agency programs to our over-all foreign policy objectives.

Organization of the Foreign Affairs Community

The Department of State is essentially the consumer of the programmed documentation of other agencies. We have been assigned the role by the President of coordinating the activities of other agencies. PPB documentation can become an essential tool in this coordination. By requiring an explicit statement relating the specific program to a broader foreign policy interest, PPB—properly applied—forces into the open conflicting agency objectives and thus helps the senior officers to locate, understand, and resolve these differences.

Abroad, the coordinating role is accomplished under the leadership of the Ambassador. He bears ultimate responsibility for the programs of all agencies in his country; the Washington agencies look to him—as leader of the country team—to present programs and suggestions for activities, as well as to review their effectiveness once approved.

In Washington, the President has asked the Secretary of State to exercise a similar leadership and coordinating role. The President has also established a Senior Interdepartmental Group, which I chair, to advise the Secretary and the President on matters affecting more than one agency. The Senior Interdepartmental Group includes all of the principal agencies* and, when the occasion requires, other responsible officers can be invited to its deliberations.

Our main effort over the past year has been directed at producing the kind of analysis that will make for better decisions by the Secretary of State and the President. We are particularly interested in establishing guidelines and policy objectives which can then be used as a framework by the individual agencies with programs abroad.

Below the SIG level, each Assistant Secretary of State in the five geographic regions chairs an Interdepartmental Regional Group (IRG), with representatives from the same agencies and departments that sit on the SIG. Our effort in the IRGs over the last year has been to make them as management-minded as possible. The natural first step has been for the interagency group to examine objectives, determine priorities and look at the cost implications of their policy choices. Once an Assistant Secretary understands that he has been given responsibility for coordinating major programs in his area, he will actively seek to create the necessary tools to do the job.

Developments Over the Past Year

The SIG has attempted to develop statements of US policy goals and an agreed interagency analysis of situations in several specific geographic areas. We have—over the past year—reviewed the situation in the Middle East, Africa, and Latin America. When an area analysis has been discussed and agreed, it becomes the basis for the broad outlines of policy for the areas. It helps the program agency

*SIG Membership: Under Secretary of State (Chairman); Deputy Secretary of Defense; Chairman, JCS; Director of Central Intelligence; Special Assistant to the President for NSC Affairs; Administrator, AID; Director, USIA; Under Secretary of State for Political Affairs; Deputy Under Secretary of State for Political Affairs; often attending—the Under Secretaries of Treasury and Agriculture.

to decide where to place emphasis, and what specific actions to take in support of that focus.

In the Latin American Bureau, the Assistant Secretary has set up a more formal—albeit experimental—program review system. A Country Analysis and Strategy Paper (CASP) is prepared by each of our Latin American Missions at the beginning of the calendar year. The purpose of the CASP is to:

- put together a descriptive analysis of the situation in the country;
- relate the country situation to specific US interests and objectives.

These papers—which suggest future programs and review and evaluate past programs—are then discussed in March and April by the Latin American IRG, under the Chairmanship of our Assistant Secretary. The approved paper constitutes general guidance to the separate agencies operating in that particular country. The agencies, in turn, use this guidance as they prepare their program documentation for presentation to the Bureau of the Budget.

The CASP procedure is still in the experimental stage. Its strength is that it forces senior officials—first the Ambassador and then the Assistant Secretary—to review all our activities in a particular country. Such a review will, we hope, help us point our programs at key targets, thus getting at an old bug-a-boo of bureaucracy—the continuation, through inertia, of programs that are either marginally important to our purposes or, in some cases, opposed to them. It will, as well, help us link US efforts to self-help programs of recipient countries.

As a review document, the CASP is weakest in hard analysis (this may well be an inherent difficulty of applying PPB techniques to foreign affairs). To measure program effectiveness there should be a direct link between shared US-recipient country objectives. Yet, in most cases, our programs are marginal to the total effort, e.g., a small agricultural loan in a country with major agricultural deficiencies and large programs of its own. But these marginal inputs can be important, and our analytical tools ought to be designed to tell us where it is most useful to concentrate our effort. Even more important, PPB techniques should make it possible more easily to demonstrate to busy senior officials that a decision or choice is necessary on a particular issue.

I have emphasized the Latin American country review experience as an illustration of our tests of PPB-type techniques. The CASP is systematically applied to the whole area because there is the general framework of the Alliance for Progress.

Elsewhere, where we do not employ the area-wide approach, we have analyzed all our programs in particular countries in ways tailored to the particular issues involved. The most recurrent problem requiring systematic country review, for example, is a conflict between military security objectives and economic development. Where we are giving both military and economic assistance it is essential that the mix of our own efforts and the country's programs is right, and that US agencies are not pulling against one another.

The Bureau of the Budget and Program Review Techniques

In earlier years agency submissions to the BOB were reviewed by Budget Bureau officials and officials of the agency concerned. Only occasionally was State asked for guidance on matters relating to foreign policy. Last August—as a result of an agreement between the

Director of the Bureau of the Budget and me—BOB and State jointly reviewed agency submissions for FY 69. We will conduct a similar review of FY 70 submissions next fall.

The documentation used in these reviews is the PPBS submission of AID, Defense, etc. But this documentation, alone, has proved insufficient for our needs. By offering alternatives, good analysis and stress on issues, PPB material can vastly improve the stuff from which policy decisions are made, but we also need an analytical brief that raises issues more starkly. Program memoranda alone do not provide the vehicles for raising policy issues—further staffing is needed. I have, therefore, set up a small staff that does for me what the staffs of the Budget Bureau Director and the AID Administrator do for them.

I can readily associate myself with Tom Schelling's statement that applying PPB in the foreign affairs field is to move from an area of relative simplicity (Defense systems) to one both complicated and disorderly. A group of highly qualified theoreticians worked for some eight years to develop the techniques which Bob McNamara brought into the Defense Department in 1961. I see no reason to believe that it will take less time to develop techniques that we—working with far less quantifiable material—can use to help us in making our policy decisions.

Finally, when I argue for a more systematic approach to policy making, this does not mean that I believe that the development of such a "system" is an end in itself. Nor do I believe that the "system" should make the policy decision. What it can do is clarify issues, thus giving the policy-maker greater confidence that he has the information necessary to make the right choice.

I personally have no fear that the use of PPB as a management tool will lead to a breakdown in human and political control of the decision-making process. Quite the contrary. What I do fear is that as our lives—and the world in which we live—become more complicated we will be overwhelmed by the very complexity we have ourselves created.

Sincerely,

NICHOLAS DEB. KATZENBACH.

MEMORANDUM ON PLANNING—PROGRAMMING— BUDGETING (PPB)

By U. Alexis Johnson

(U.S. Ambassador to Japan)

I much appreciated Senator Jackson's invitation to submit to the Subcommittee by memorandum my views with respect to Planning-Programming-Budgeting (PPB), and my delay in responding has not been due to any lack of interest, but rather to the pressure of events during the recent months in this part of the world. Also, during recent weeks I have been forced to put into practical application some of the concepts that my staff and I have been seeking to develop in this field in responding to the President's directives with respect to reducing overseas staffs.

First, by way of background, I want to say that I make no pretense of being a theoretician or scientific thinker in this whole field of government administration, but have always operated pragmatically, trying to do what it seemed to me needed to be done in whatever way seemed most practical. I do not say this in any disparagement of those who have developed the PPBS or other undoubtedly valuable tools of management, but rather to say that my own bent of mind does not normally run in such directions. Therefore, I have read with particular interest the copies of the testimony before the Subcommittee so thoughtfully sent to me.

My own somewhat peripheral exposure to the PPBS as applied in the Department of Defense came during the period between 1961 and 1964, and between 1965 and 1966 when, as Deputy Under Secretary of State for Political Affairs, I participated in staffing the Secretary of State's review of the Secretary of Defense's draft memorandums for the President to which Dr. Enthoven made reference in his testimony. During that period of service in the Department of State I also had some brief and inconclusive discussions with those who were seeking to develop the Comprehensive Country Programming System (CCPS) and the Foreign Affairs Programming System (FAPS). I also had some discussion of these matters when I was working with General Taylor in the drafting of NSAM 341 which established the Senior Interdepartmental Group (SIG) and Interdepartmental Regional Groups (IRG).

As an Ambassador abroad in a number of posts and in my service in the Department of State seeking to coordinate and direct all of the varying aspects, instruments and interests involved in our foreign affairs I have, of course, been impressed, and often frustrated, at the difficulties inherent in our present structure for operating our overseas programs. I am also conscious that many Americans, both within and without the Government, are voicing increasing concern over the need for and application of stricter priorities in the conduct of our overseas programs. This is right and proper, and I have an open mind toward anything that will contribute to this end.

I have used the term "overseas programs" in the foregoing paragraph to refer to "programs" such as those of State, AID, MAP, USIA, PL-480, etc. and to separate this from the broader and usually more fundamental aspects of our foreign policy. It is possible to consider some kind of a PPBS approach to the former problems, but the latter, while calling for logical thought processes, do not lend themselves to any kind of a budgetary approach. That is, there can and should be some method of analyzing whether we are spending too much or too little on AID or MAP in any particular country and whether the expenditures are the most economical and efficacious to accomplish a particular objective. However, no budgetary approach can help the President or Secretary of State in reaching decisions on the most important and fundamental foreign-policy decisions such as what one does about an ultimatum with respect to Berlin, or the installation of nuclear missiles in Cuba; what one does to attempt to stop hostilities between Pakistan and India, or between Israel and the Arab States; how one seeks to bring about the release of the Pueblo and its crew; whether one votes for country "X" or country "Y" as a member of the United Nations Security Council; what atti-

tude one takes with respect to a military coup in country "Z", etc., etc. What I am saying is the obvious fact that the overwhelming mass of foreign-policy problems and decisions, and those that determine the fundamentals of our relations with other countries, are political in the broadest and best sense of the term and do not lend themselves to any budgetary approach. (Of course, in matters involving our military forces prior budgetary decisions will have determined whether we have the capabilities to carry out any particular line of action. Much the same could be said with respect to our AID and MAP programs.)

Another truism is that in this short post-war period the economies (and politics) of the world have become so interdependent that it is no longer possible to even attempt to draw a clean line between domestic and foreign affairs. In a true sense there is almost nothing that we do in domestic affairs that does not have some impact on some foreign countries, and correspondingly what foreign countries do in their domestic affairs has an impact on us. For example, decisions by private American enterprise with regard to building or not building synthetic rubber plants may be the decisive factor in determining the relations of a particular country with the United States and perhaps in determining the domestic political stability of that country. Correspondingly, a decision by private enterprise in another country to modernize and expand its steel production can affect the New York stock market and thousands of American steel workers. And, of course, this is not just a question of how the United States itself acts and reacts with individual countries abroad, but rather the way in which the some 140 other countries in the world all act and react on each other in what each considers essentially its domestic affairs. I will not further labor the point that there is an enormous dimension to foreign affairs entirely outside of the normal concepts of diplomacy and our programs abroad. Seeking to ignore this dimension does not change the fact that it exists.

There is another obvious dimension to our foreign-policy problems which, for the lack of a better word, I term "third-country problems." What I mean by this is the degree to which our relations with any individual country are often determined not by what we do or do not do in the purely bilateral aspects of our relations but what we do or do not do with respect to that country's conflict of interests with respect to its neighbors or other countries. For example, our relations with the Soviet Union involve very few purely bilateral problems. For the most part our problems involve third countries or areas such as Berlin, Germany, Cuba, Korea, and so on. Much the same is true of our relations with the Arab States and Israel, with India and Pakistan, with Cambodia, Thailand and Vietnam, with Turkey, Greece and Cyprus, and so on. That is, much, and often the major part of our relations under these circumstances, will not be determined by purely bilateral considerations but rather by the positions and attitudes we take with respect to those with whom they have differences of view. An able diplomacy and effective programs can in some cases perhaps mitigate, but normally cannot overcome, the problem that we inevitably must face because of the necessity we are under of "taking sides" or refusing to "take sides" in one country's clash of interests with another. We are, of course, often similarly motivated ourselves in our

own attitudes toward other countries. What I am, of course, saying is that like all human relationships, relationships between the some 140 countries of the world with their billions of people and their attitudes toward and relations with us are enormously complex affairs not yet reducible to any budgetary process or mathematical formula.

Recognizing the foregoing parameters in which our representation and programs in any individual country abroad must operate, no budgetary process is going to determine the personal effectiveness of any individual Ambassador or the members of his staff with respect to the Government and people of that country, and, almost equally important, what credence and weight Washington will give to their views and recommendations. As what some might term an "old fashioned diplomat" I continue to believe that this is fundamental and all else in our representation and programs abroad is peripheral in varying degrees.

However, there is a limited sphere of foreign relations in which I do feel that there is room for a budgetary type of analysis and that is obviously in the field of our expenditures within or specifically directed toward any individual country.

Of course, the difficulty here is, as Tom Schelling ably pointed out, that there is no "Foreign Affairs Budget." In most situations of real importance involving budgetary matters, the expenditures coming under the Department of State budget are an almost infinitesimal part of the whole. Defense expenditures, military assistance, economic assistance, the Peace Corps, USIA, PL-480, and so on usually have the major expenditures. No matter how able and vigorous an Ambassador may seek to be in exercising his authority over these expenditures, he usually finds that his authority is in fact very limited. I have found that an Ambassador can usually exercise his authority to prevent an expenditure of which he does not approve, but he has no ability to effect any "trade-offs" of expenditures, nor can he require another agency to make an expenditure which it may oppose.

This is also true of the Secretary of State. It was in recognition of this that in drafting NSAM 341 the phrase "to the full extent permitted by law" was incorporated. This was because it was obvious that as the Government is presently organized the Secretary of State could not, even by direction of the President, "direct" the head of another Department or Agency to do something for which that head had the statutory budgetary responsibility to the Congress. It was also for this reason that, at the insistence of the heads of some other Departments and Agencies, even in the public announcement of March 4, 1966, concerning NSAM 341, the statement was added that "This action does not affect in any way the statutory responsibilities of any of the key Government officials involved or their relations with the Congress."

Clearly there are major problems within the executive itself in attempting to move toward anything approaching a "Foreign Affairs Budget," and I suspect that the problems of the Congress adapting its traditional committee structure effectively to deal with a single "Foreign Affairs Budget" are at least not less than those faced by the executive. While, as noted below, I believe that there are some things that can be done within the executive, I question how much

real value it will have unless Congress accepts the concept and organizes itself to handle such a budget.

In seeking to move within the executive toward such a budget I agree with Charles Schultze that individual countries constitute useful categories, or, as Tom Schelling terms it, "program packages." In fact, I can see no other viable approach.

However, the PPBS assumes that you know what you want to do and are seeking the most economical and effective way of doing it. For example, in formulating his budgets the Secretary of Defense was able to define for himself and others that we wanted Strategic Forces having certain broad characteristics and capabilities. The same was true of General Purpose Forces, Airlift, Sealift, etc. The same was true of weapons systems, other "hardware" and manpower needs within these categories. In other words the objectives were known and, very importantly, were also readily quantifiable.

As I see the problem the PPBS can be applied effectively only where objectives are quantified. As this is thus far not the case in foreign affairs, it is entirely premature to talk about applying the PPBS to foreign affairs until one has determined whether and how it is possible to quantify foreign-affairs programs with respect to any individual country. If it can be done with respect to individual countries, then it should be possible to move toward an integrated "Foreign Affairs Budget."

What I have to say on this is without any real knowledge of the present stage of development of the Foreign Affairs Programming Planning Budgeting System (FA/PPBS) toward which I know the Department of State was seeking to work about the time I left Washington in 1966. Therefore, what I have to say should not be interpreted as reflecting on work which may have been done in this field which has not come to my attention.

The first problem is, of course, defining our objectives with respect to any individual country with such precision that they are translatable into programs. This is not easy to do. Up to now my general observation is that although much able talent has been devoted to planning documents, country papers, etc., the intra and inter-departmental process by which such papers are produced results in broad general exhortations to the Department of State itself and to other Departments and Agencies to "increase" such and such, to "persuade" so and so, etc., etc. While priorities of objectives will often be indicated, there is all too often not enough attention given to what the priority of effort should be. What I have in mind is that while in our mind a particular objective may have a very high priority, the situation is such that U.S. programs can have little or no influence. Therefore, it may be that the same U.S. expenditure on another objective will be more productive. Also, a series listing of priorities usually has little meaning. Such a listing does not give any guide as to how important objective two may be relative to objective one, nor does it give any indication of what the "pay-off" may be for a given expenditure of effort on either objective. I do not mean to imply that such matters have not and are not given consideration, but I do not know of any form of presentation yet developed that forces some precision in thinking and negotiation, as opposed to the usual practice of "negotiating out language" to the point that each is free to interpret in his own way.

My thought is that this problem is not necessarily insoluble, but, in fact, must be solved if we are ever to arrive at anything approaching a "Foreign Affairs Budget" even within the executive. First, I believe that it is possible to define the objectives of our programs in any given country much more specifically than has normally been the case in the past, and to do this in such a form as to be able specifically to relate objectives and programs. Also I think that it should be possible to arrive at much more specific judgments on what the "pay-off" will be of a given weight of program effort with respect to any specific objective. I also think that it should be possible to do this in some quantitative form.

As an illustration of the kind of approach which might make possible the really fruitful application of PPB concepts to our programs abroad, I am enclosing a statement on the subject by my Deputy Chief of Mission, Minister David L. Osborn, who, while serving as Deputy Assistant Secretary of State for Educational and Cultural Affairs, and now in his present position in Tokyo has endeavored to apply some of these principles. Purely for our own internal use for some time before the President's directive on reducing personnel abroad was received, we had largely completed a Country Team-wide project of defining our objectives at this post in as specific a form as we could. When the President's directive was received we established a task force to rate on a numerical scale each "vulnerable" position in the mission on the contribution it was making to these agreed specific objectives. I then used these ratings as a guide in formulating my own recommendations for reductions.

The limited use we have made here of objective quantification is very far from demonstrating the validity of the method described by Mr. Osborn. There may be other methods and approaches, but I believe that an approach of this general type is desirable. There is obviously no magic in such an approach, and good managers and executives are already consciously or intuitively applying similar judgments. The present difficulty is that there is nothing in the inter-departmental process that gives a clear and indisputable operational "bite" to what may have a surface appearance of agreed policy guidance. "Adjectives" are used as a substitute for "dollars in budgets," and "dollars in budgets" are defended by "adjectives." We need quantities to relate to the quantities in which our allocation-of-resource decisions are inevitably expressed. Developing a comprehensive system to make this possible is not going to be an easy task; but I am convinced that a concentrated effort is warranted. It is in this spirit that I have offered the foregoing views, which I hope will be of some help in the deliberations of the Subcommittee.

U. ALEXIS JOHNSON.

Enclosure: As stated.

TOKYO, JAPAN, *April 23, 1968.*

STATEMENT PREPARED BY MINISTER DAVID L. OSBORN, DEPUTY CHIEF OF MISSION
AMERICAN EMBASSY, TOKYO, JAPAN

ALLOCATION OF RESOURCES

Very few of the major decisions in the foreign affairs field are made as resource-allocation decisions, but they generally have important resource-alloca-

tion consequences and they generally involve resource-allocation problems, whether or not they are recognized as such. It would be unrealistic to expect any early change at the highest level of the existing system, whereby the solution of major allocation-of-resource problems is left to the interplay of political forces. This fact, however, is no excuse for a continued failure at other levels of government to treat resource-allocation problems as such, or for a continued postponement of aggressive efforts to improve our ability to solve them—*if* improvement is possible. I believe that improvement is possible and urgently needed.

Allocating resources is a matter of distributing a limited amount of resources among feasible alternatives so that the worth of all the things obtained will be the greatest obtainable for that amount of resources. An allocation-of-resources decision (for example, the composite of the annual program proposals submitted by all elements of this mission) thus in effect implies a judgment, first, that the thing produced by each individual alternative selected is worth the amount of resources proposed to be allocated to it, and, second, that no different distribution of resources among the alternatives would produce goods of greater total worth. Are these periodic judgments, which are rendered collectively or individually, consciously or unconsciously by every U.S. mission, accurate? The application of logical method, if it can be brought to bear, will provide a useful supplement to the expert intuition of those in the field who render the judgments, and those in Washington who review them.

To judge logically and methodically the accuracy of an allocation-of-resources decision, one needs an accurate and complete statement of the cost of each alternative, a measure of the things produced by each alternative; and a measure of the relative worth of the things produced.¹ All three—costs, output, and worth—must be quantified if they are to be systematically and logically related to each other. PPB is doing a great deal to improve the statement of costs and the description and measurement of output, but the next necessary step, the measurement of relative worth of output, has not yet been taken.²

Quantitative measurement of the relative worth of goods produced by alternative ways of expending resources in foreign affairs operations is difficult but feasible. A starting point is the quantification of the priorities of the interests or objectives advanced by the operations. Unquantified priorities state the order of precedence of things: "A shall come before B, B before C," and so on. "If it comes to a choice between A and B, A should be chosen and B sacrificed." Quantified priorities, on the other hand, are neither sequential nor either-or. An objective of priority 250 is two-and-a-half times as important as an objective of priority 100, which is four times as important as an objective with a priority of 25. The relative worth of an alternative is quantifiable as the product of its effectiveness in advancing one or more objectives times the priority of the objective or objectives. For instance, an alternative which is highly effective (say 80%) in advancing an objective with a priority of 25 might be worth more (i.e., 20) than an alternative which is only fairly effective (say 15%) in advancing an objective with a priority of 100.

A good allocation of resources would be one in which the relative advancement of each of the United States interests (or objectives) involved was proportionate to the relative priority of the interest (or objective), and in which the total advancement-of-interest was the maximum obtainable for the given amount of resources.³ Mathematically valid systems exist for making allocation-of-resources decisions which fit this description, with an accuracy-of-fit commensurate with the accuracy of the data (costs, effectiveness of output, and priorities) used. It remains to be demonstrated whether it is possible to develop data by which to make resource allocations capable of serving as really useful adjuncts to the judgment of the experienced men and women who must continue to have the final say; however, there is ample experimental evidence to justify an aggressive effort to test out this possibility.

¹ There are, of course, other requirements, such as that for a systematic analysis of the productivity of resources devoted to each alternative, including the identification of points and rates of diminishing returns on investment in each alternative.

² USIA's PPB, at least as applied here, has used the "exposure" as a unit for measuring output of programs; but the value of this basic unit obviously varies from program to program, and PPB does not attempt to measure its value.

³ This statement assumes, of course, that the "given amount of resources" represents a valid determination—a question involving allocation of resource decisions of a higher dimension.

APPLICATION OF PPB IN USIA

(Letter from Hewson A. Ryan, Deputy Director, Policy and Research, USIA)

U.S. INFORMATION AGENCY,
Washington, July 5, 1968.

HON. HENRY M. JACKSON,
U.S. Senate.

DEAR SENATOR JACKSON: In the absence of Mr. Marks I am replying to your letter of June 13, 1968. Adapting the principles of the Planning-Programming-Budgeting System (PPBS) to the problems and needs of the U.S. Information Agency has required substantial effort. Those officers particularly charged with this task have been aware of, and have found useful, the several documents which your Subcommittee has published as a result of your study of PPBS in the defense and foreign affairs fields.

Of particular interest was the Memorandum from Dr. Thomas C. Schelling to your Subcommittee, reflecting among other things his conclusion that individual countries are the basic program unit for foreign affairs budgeting. After considerable experimentation, we had come to the same view, and were gratified to find our own conclusion thus supported.

The Agency's PPB System treats the activities in each country as the basic program package or "category." On the basis of Program Memoranda from major country posts, the six regional offices in Washington prepare their respective Regional Program Memoranda. The resource allocation from these memoranda is then presented in the USIA Program and Financial Plan. This system can generate alternatives, in the form of incremental changes among more or less effective activities, which the Agency considers internally and uses in a budgetary presentation. This format has the advantage of demonstrating more clearly (than in the appropriation breakdown) the relative distribution of selective program increases which occur.

Comparison of inputs to outputs is necessary for the application of cost analysis in a PPB System. USIA adopted as the unit of output an exposure, defined as: "one time one person is reached by an Agency product, employee or institution." The system also recognizes that there are qualitative differences in exposures achieved through one medium in contrast with exposures achieved through other media. Thus, a book may be more or less persuasive than a motion picture. The Agency's PPB System attempts to capture and reflect these qualitative differences by soliciting the judgment of its most experienced officers to ascertain the relative quality of the various media in such matters as "persuasiveness", "depth of impact", "timeliness" and "credibility."

Additionally, given its limited resources, the Agency has sought to focus its information efforts on leaders and molders of opinion, and only rarely has it sought a mass audience. The PPB System also recognizes that when a mass medium is used, there will be viewers or listeners who are not members of identified target groups, and these constitute the so-called "spillover audience." While analysis centers on exposures achieved among members of target groups, and the cost

and quality of such exposures in contrast to other means of achieving the same exposures, this does not mean that "spillover exposures" are considered to be without value. At the very least, it is likely that they help to create a disposition towards or a sympathy for a U.S. position among significant numbers of people who are then the more easily persuaded by their own opinion leaders who support the U.S. position in some aspect of international affairs.

I should emphasize at this point that the PPB System adaptation which we are using is very much in the experimental stage. There are benefits, and there are problems and limitations. Among the more significant benefits which we see are these:

1. *Introduction of continuity at critical decision points.* One effect of a foreign affairs personnel management system is that the people in charge of USIS country programs (Public Affairs Officers) and the Assistant Directors for Areas are transferred to other jobs every two to four years. Very often, their replacements have different backgrounds, different experiences, and different ideas. Understandably, there is a strong tendency to reshape the existing program to fit the background, experience and ideas of the new officer in charge. The PPBS requirement that program activities and their rationale be reduced to statable, and stated, propositions introduces a desirable degree of continuity at the points where program decisions are made.

2. *A sharper definition of our research needs.* We now have a more precise idea of the kind of information needed to assist in program management decision making, and what research can do to help provide this information.

3. *Points up our need for a substantially improved system for collecting data about our efforts and their effects.* Attempts to use existing data too often revealed substantial defects in the data gathering system, which, in turn, invalidated any conclusions that analysis of the data might have produced. As a result, we are presently designing new record-keeping systems.

4. *Introduction of the "total cost" concept in evaluating activities.* Elementary as this might seem, past budget and accounting practices did not easily reveal the total cost of an activity, but only that part of the cost which might be paid from funds allotted to a country post, or to a regional printing plant, or to a media service in Washington. Since the system requires that the total cost of an activity be arrayed, this information is now available for consideration in making program shifts intended to achieve a more effective or efficient use of resources.

As to the problems and limitations of the system, the most serious that we see are these:

1. *Limitations of the quantification process.* That the quantification process has limitations was recognized from the start and, as noted earlier, qualitative factors have been built into the system as it now operates within the Agency. However, experience so far has not wholly convinced us that an "exposure" is the most useful and efficient unit of measure for our purposes, and further thought is being given to this problem.

2. *Increased workload for USIS posts overseas.* Using individual countries as the basic program package has meant a substantial burden of work on USIS posts. We are now seeking ways in which this burden can be reduced.

3. *Existing requirements result in the operation of two budget systems.* While the PPB System does serve the budget planning requirements of the Executive Branch, it does not produce information which the Congress requires be in the Budget which is submitted to it. Consequently, we must collect and array budget information in the PPB format and in the format required for the traditional budget submission.

So much for the benefits and problems which we associate with the Planning-Programming-Budgeting System and its adaptation to the needs of the U.S. Information Agency. The consensus among the senior officers is that we are better off with PPBS than without it. A couple of them have said in effect that if the system didn't exist, we would have had eventually to invent it. It has narrowed the range of the "unknowns" about which a decision maker has to guess when arriving at his decisions. The problems that exist are ones which we believe we can solve as we continue to experiment with the system. Clearly, we do believe the system justifies this.

If you need additional information, or clarification or expansion of any of the material above, please let me know.

Sincerely,

HEWSON A. RYAN,
Deputy Director (Policy and Research).

APPLICATION OF PPB IN THE PEACE CORPS

(Letter from Jack Vaughn, Director, Peace Corps)

PEACE CORPS,
Washington, July 5, 1968.

HON. HENRY M. JACKSON,
U.S. Senate.

DEAR SENATOR JACKSON: This letter is in response to your inquiry of June 13 concerning the status of our application of PPB in the Peace Corps.

The heart of the answer to your question lies in the three papers we are enclosing. The first, abstracted from our Congressional Presentation for fiscal year 1969, is entitled *New Trends in Programming*. The second, entitled *Program Memorandum Revision*, outlines the 1968 guidelines that were sent to our field staff to be used in preparing the individual country Program Memoranda. The third, entitled *Policy and Criteria for Peace Corps Programming* details the criteria that are used by our Program Review Office in judging the quality of program proposals. The body of the letter which follows is designed to give you my thoughts on how PPB has helped the Peace Corps and the status of its development.

In installing PPB in the Peace Corps, it has been our cardinal principle that this system must enhance decision-making and analysis by the existing decision-makers rather than alter the locus of decision-making. By setting-up a PPB program structure that coincides exactly with our decision-making structure, we have avoided many of the problems which PPB can—but we feel need not—bring with it. At the same time, we have good evidence that the PPB system has improved our decision-makers' analyses.

Each overseas country program is considered a program category, and each Country Director writes—with the advice of host country nationals and Peace Corps Volunteers—his own Program Memorandum. The fact that Peace Corps programs must respond to host country requests and be integrated into host country programs, rather than dictate these requests or decisively shape host country programs, also makes this structure of program categories particularly appropriate to the Peace Corps.

In preparing the Program Memorandum, the Country Directors are asked annually to answer the following questions—after consultation with host country nationals, government officials, and Peace Corps Volunteers:

(1) What are the Major Problems Facing Your Country in the Foreseeable Future?

(2) What are the Limitations on the Peace Corps?

(3) Which of the Major Problems Facing the Country or Which Elements of These Problems Lend Themselves to Peace Corps Programming?

(4) Within These Problems Susceptible to Peace Corps Programming What Specific Objectives Can the Peace Corps Set for Itself?

(5) What Alternative Projects Would Achieve the Objectives in the Problem Areas and What Are the Project Objectives?

(6) How Do These Alternative Projects Compare in Terms of Effectiveness and Host Country Involvement? Which Alternatives Are Better?

(7) List the Problem Area Objectives and the Projects Within Them in Such a Way as To Indicate Priorities.

We have emphasized to the County Directors the necessity that the Program Memorandum be a realistic planning document. The Program Memorandum should not be a theoretical design of an ideal program but should reflect the practical constraints in which we operate—political, economic, cultural, racial, financial, organizational, etc., as they affect conditions in the host country.

As a result of the first PPB analysis, the Peace Corps made a decision to increase its agricultural programming. Our Country Directors, as they analyzed the programs of the countries in which they were working, almost universally concluded that agricultural development was an important problem area in which the Peace Corps could contribute and which had been given insufficient emphasis. The collective plans of the overseas Country Directors as evidenced in their Program Memoranda indicated an intention to multiply the number of Volunteers in agricultural programs by more than 2½ times from 1967 to 1970. This could mean that some 5,300 Volunteers would be serving in food supply programs as compared with some 2,000 at the beginning of the current program year assuming we placed a corresponding number into training.

The systematic comparison of alternative programs to achieve newly defined goals in the field of education has caused the Peace Corps to place increased emphasis on teacher training programs in preference to classroom teaching of children. The number of Volunteers in education programs is roughly the same as in spring 1966; however, the proportion serving as teacher trainers has increased by approximately one-fourth.

The analysis brought about the realization that to achieve the goal of improving educational standards, teacher training programs are a more efficient vehicle than classroom teaching. Also, recognition of the limited goals that can be achieved through injecting a small number of primary school teachers into a relatively large primary school system has caused primary school education programs to have a much lower priority than was the case previous to the PPB analysis.

The new country plans also call for doubling the number of Volunteers in health projects from some 1,500 Volunteers during the current program year to 3,000 in 1970. A major activity would be the prevention or eradication of specific diseases such as malaria and TB. We and the countries we assist have found that Volunteers can be trained in the precise skills necessary to mount an effective attack against these crippling and killing diseases.

We have felt that PPB is valuable only to the extent that it influences decisions and improves the analysis on the basis of which our Country Directors make their decisions. We regard the fairly dramatic changes in the directions of our programming as listed in the preceding three paragraphs as good evidence of the value of PPB to the Peace Corps in improving the effectiveness per Volunteer of our program. These changes in direction have been the result of the progress PPB has enabled us to make in setting priorities among the needs of the countries in which we work and in establishing more valid and precise goals for the programs in which we are involved. We expect Regional Program Memoranda in 1969 to increase agency awareness of specific Regional Programming issues and further to improve the analysis on which program decisions are based.

The Peace Corps has an ability almost unique among Government organizations to change the directions of its programs within a relatively short time span. Since each Volunteer goes into the field for a 24 month tour of duty, a positive decision must be made each 24 months on whether or not to continue a program. Thus it becomes a relatively simple matter to terminate an activity which has not worked as well as we would like and to switch our resources into a new channel. This situation has perhaps accelerated the impact of PPB upon the programs of this Agency.

Organizationally, we have integrated our PPB analysis into the office where we allocate Volunteers among the requests from the various countries. Our planners and top level decision-makers are thus to a great extent the same. Since the Peace Corps has always had a demand for Volunteers greater than the supply of available applicants, the allocations must be made among competing requests. Inevitably, the justification by the field staff for allocating Volunteers to their program is sometimes parochial. Our planners have the authority to focus the various advocates on the important issues. The goal of planning in our opinion is to maintain a continuous dialogue between the planners and the decision-makers in the field. As a result of this continuous dialogue, and by asking questions—hard questions—our planners improve the quality of analysis by our decision-makers in the field.

To enhance the quality and realism of this dialogue, our planning office includes decision-makers with overseas field experience. Their

presence ensures the relevance of the questions and analysis which come from our planning section and prevents any tendency of solely academic theories to replace judgment and experience. We have also attached our Research Division to this Office so that our research can be immediately relevant to our program and operation analysis.

Our PPB system has centered on the analysis developed in the Program Memorandum and Special Studies rather than in statistical comparison of output measurements. We have not found it possible as yet to develop reliable statistical measurements by which all projects can be mechanically compared.

The Peace Corps has labored over the issue of developing statistical output measures on the basis of which input allocations could be made. The principal benefit from these labors has been—and I think it is a great one—to focus the attention of the Agency on what we hope to accomplish in each of our programs and to develop a useful and formalized way of reporting on actual accomplishments.

There are a number of limitations that we face in developing output measures and they are as follows:

1. Some of the outputs (e.g., changes in attitudes and habits) in a person-to-person program such as the Peace Corps are particularly resistant to statistical measurement at reasonable cost.

2. Even if measurable, some of these outputs would be so politically sensitive that it would be difficult to carry out the measurement process.

3. To a very great extent, the Volunteers are integrated into host country programs. Although the output of these programs may be eminently measurable, it is unrealistic and politically impossible for the Peace Corps to claim credit for the entire output of the project or even to measure accurately the exact proportion of project achievement attributable to Peace Corps' share of the inputs.

We have a number of research projects now in the field studying methods of evaluating accomplishment in different types of projects and—perhaps more important—are now revising our termination of service questionnaire to include hard data on what the Volunteers have accomplished. I think this improvement in our operations, stemming from PPB, has been an important development which will have its impact felt upon our programming within the next 18 months.

We have also applied the PPB concepts of systematic analysis to the problems of our service division. The vehicle has been the Special Analytic Studies which the Bureau of the Budget requests in support of our budget request.

In the past two years we concentrated our analysis on the Selection Division. Those studies focused on the problem of forecasting the number of trainees likely to be available throughout the year and building a data base upon which comparisons can be made from year to year on the number of applicants rejected, accepted, and trained. This year we are undertaking Special Studies relating to the potential Peace Corps applicant population, the cost and effectiveness of various methods of recruiting applicants, and the cost and effectiveness of alternative methods of training Volunteers in Language and Agriculture skills.

The Bureau of the Budget has been particularly helpful in assisting us and allowing us to design all of these Special Studies to get

answers to important problems within the Peace Corps rather than abstract problems which do not have operational relevance.

Our purpose in undertaking the Special Studies is the same one that we have in introducing systematic analysis in our overseas programs, viz., to enhance decision-making and analysis by the existing decision-makers rather than altering the locus of decision-making.

I hope the above summary of the status of our application of PPB is useful to the Committee. If you have any further questions, I will be happy to answer them for you.

Sincerely,

JACK VAUGHN.

Enclosure: As stated.

NEW TRENDS IN PROGRAMMING

In the Spring of 1966, we took the first steps toward development of a decentralized, long-range planning system designed to work with host country governments to focus Peace Corps programs more explicitly on the central problems of the nations in which we work and to enable us to program for maximum effectiveness our most valuable resource, the Peace Corps Volunteer.

Our first objective was to define the aims of each of our country programs in relation to Peace Corps' overall goals and the major problems facing each country, so that Peace Corps Volunteers could be effectively engaged in the most important and the most satisfying work.

The major focus of our attention was, as it is today, on the Volunteer himself—what he can bring to his experience in skills and attitudes and what he can bring back as a better American: one who understands the problems and aspirations of the people of the developing nations.

Each country director prepared an analysis of the most important development problems in his country of assignment, as seen by the host government and the Peace Corps, identified those lending themselves to Peace Corps assistance, and proposed concrete goals for Peace Corps activities.

The following examples of program goals are taken from proposals submitted in 1967 by Peace Corps country directors as a result of the second annual planning exercise:

In *Colombia*, where little more than half of urban children and less than ten per cent of rural children finish more than the second grade, a major Peace Corps goal is to train teachers. Two hundred and fifty Volunteers, or more than one-third of the Volunteers in Colombia, are in education programs.

The goal for the 53 Volunteers in *Guyana* is to increase the number and percentage of secondary school graduates qualified to take the General Certificate of Education examination, and the success rate—currently about 5 per cent—among those who take them.

In Africa, a high priority of almost every government is the expansion of secondary schools in order that young Africans can be trained to take over the running of their governments and economies. We have over 2,000 Volunteers working as teachers or teacher trainers in Africa—75 per cent of them in secondary schools. These secondary school teachers have been crucial in staffing the expansion of secondary school systems and are thus making it possible for thousands of additional young Africans to receive high school educations.

In southern *Togo*, 60 per cent of the population lives on a corn staple diet and more than 30 per cent of cultivated land is used for growing it. Yet more than half the corn crop may be destroyed by weevils and other insects while it is stored. Volunteers are showing farmers a cheap and simple way to fumigate the granaries, killing the insects while leaving the corn safe for consumption.

The dearth of trained manpower in *Botswana* is immense, even by African standards. Less than 50 Botswana citizens hold university degrees. The goals of 34 education Volunteers in Botswana are to facilitate expansion of secondary school capacity and to upgrade the quality of elementary school

education through provision of teacher trainers and more highly qualified teachers.

Ceylon is second in world tea output and a major producer of rubber, but, because of concentration on exports, food production for local consumption has lagged behind the needs of the population. Fifty-six Volunteers are now at work assisting subsidiary crop development (potatoes, rice, onions, corn, sorghum and others), dairy production, applied nutrition and rural community development.

In *Korea*, the rural health infrastructure is a weak link in the Republic's health program. The Government plans to cope with this problem by establishing a network of more than 1,300 district health centers in rural areas, making use of health auxiliaries for preventive health and health counseling services. The major threat to the program's implementation is the lack of qualified manpower to staff these centers. The Peace Corps has attached 105 Volunteers to the Korea teams engaged in the work of starting up these health centers.

Country directors and host government officials analyze and discuss goals and compare alternative programs. In the 1967 analyses, they requested that the Peace Corps plan to multiply the number of Volunteers in agricultural programs by more than two and one half times by the end of Program Year 1970. This would mean some 5,300 Volunteers in food supply programs compared with some 2,000 at the beginning of the current Program Year.

The new country plans called for doubling the number of Volunteers in health projects from some 1,500 Volunteers during the current Program Year to 3,000 in 1970. A major activity would be the prevention or eradication of specific diseases such as malaria and TB. Disease prevention will play an increasing important role in our health programs, as we and the countries we assist have found that Volunteers can be trained in the precise skills necessary to mount an effective attack against these crippling and killing diseases.

In Thailand, for example, Volunteers working with the National Malaria Eradication Project helped supervise malaria surveys, train workers and administer treatment. Volunteers were thus able to contribute to a decrease in malaria by as much as 20 to 40 per cent in areas of several hundred thousand people.

A relatively new Peace Corps activity is in the area of family planning. Since December, 1966, a total of 234 Volunteers have been sent in response to requests from host governments for assistance to their family planning programs. The Volunteers, most of them specially trained liberal arts graduates, are involved in all but the surgical aspects of family planning: public information programming and promotion, record keeping, supervision of supplies, establishment of new family planning centers, counseling and demonstration of effective teaching techniques.

Ninety-seven Volunteers are at work full time in family planning in India. This summer a first Peace Corps group of graduate nurses will be trained to teach Indian nurses examination techniques and follow-up care in programs promoting the intra-uterine device.

Some 105 Volunteers in Korea, 17 in Tonga (South Pacific), 8 in the Dominican Republic and 7 in Tunisia also are participating in family planning education programs.

The systematic comparison of alternative programs to achieve newly defined goals has caused the Peace Corps to place increased emphasis in many countries on teacher training programs in preference to classroom teaching of children. The number of Volunteers in education programs is roughly the same as in spring 1966; however, the percentage serving as teacher trainers has increased by approximately one-fourth.

Community development continues to be a central focus of Peace Corps programs, particularly in Latin American countries where CD programs account for more than 40 per cent of all program requests. As reported to you last year, in response to host country priorities, we are placing greater emphasis on rural community action than on urban programs. This year, rural programs accounted for 77 per cent of our community development programs compared with 67 per cent last year.

Programs are approved in the field by the U.S. country team and receive two thorough screenings by the Peace Corps in Washington. The first is in one of the four Regional Offices: Africa; Latin America; North Africa; Near East and South Asia; and East Asia and Pacific. The second screening is in the Office of Planning, Program Review, and Research, where the final worldwide allocations of Volunteers are made.

In both screenings, the program is checked against the country director's description of the critical needs of his country and his goals for Peace Corps programs. It is analyzed against a background of problems experienced in that particular country or in similar programs elsewhere in the world. Recommendations and comments by Volunteers who have served in each country are carefully studied in this process.

The training plans and training demands receive particular attention from a team of specialists in the various technical areas in which the Volunteers are to be prepared. Training plans are crucial, as most persons who volunteer for the Peace Corps must be given training to provide specific new skills to meet the technical needs of the developing nations.

Finally, once it has been established that the program is important to the development plans of the host country and that program and training goals are feasible, the program is compared to other requests from around the world. Volunteer applicants are then assigned to the programs which are expected to result in the most effective use of the Peace Corps' human and financial resources.

After the program details have been worked out, the Agency for International Development reviews the program and concurrence of the Secretary of State is secured before the program is finally approved by the Director of the Peace Corps.

As a result of this planning system we think we have made considerable progress in setting priorities among the needs of the countries in which we work and in establishing useful goals for the programs in which we are involved. We are more effectively applying to each program proposal the experience of the 33,000 Volunteers who have served in 834 projects in 63 nations over the past seven years.

Complete and systematic descriptions of our program activities and quantitative measurement of our program results are extremely useful as tools for improving programs. We are giving more attention to the problem of systematic measurement of program effectiveness which will allow us to compare one program with another. We have made some progress in coping with the major obstacles to such measurement: the great variety of project goals, the seemingly intangible aims of human development and attitude change, and political sensitivity involved in Americans doing evaluative studies in another society. A number of research projects have been devised to solve these problems. These include:

1. *Joint Effectiveness Study of Peace Corps Programs in Turkey.* This study is being designed by the Turkish Government and the Peace Corps. If feasible, it will be the first joint study (with the host country government as co-researcher) of Peace Corps effectiveness. If successful, it will be the model for other Peace Corps countries.

2. *Effectiveness of Peace Corps Volunteers in Uganda, Tanzania and Ethiopia, and Design of a System for Assessing Overseas Impact in Education,* under contract with the Human Development Foundation.

3. *Research on Education Television Program in Colombia: Programming and Effectiveness,* under contract with the Institute for Communication Research, Stanford University.

4. *Impact of Peace Corps Volunteers Serving in Philippines Math/Science Project,* under contract with the Institute for Communication Research, Stanford University.

5. *Effectiveness of Peace Corps Teachers in Sierra Leone,* under contract with Raymond Lewis.

6. *Assessment of the Peace Corps Tuberculosis Control Project in Malawi,* under contract with the University of North Carolina.

7. *Assessment of the Peace Corps Public Health Project in Bolivia: Anthropological Report,* under contract with the Research Institute for the Study of Man.

8. *Peace Corps Teacher Training Effectiveness in the Dominican Republic.* A study by the Peace Corps of host country teachers and host country pupils, of Peace Corps teacher training programs.

9. *Programming and Effectiveness of the Bolivia Tuberculosis Control Program.* A study done as part of Volunteer support by David Danielson, a public health specialist, formerly with the University of Washington, and now with the Office of Medical Programs of the Peace Corps.

10. *Office of Planning, Program Review, and Research Questionnaire Study.* Analysis of experimental questionnaires completed by 433 Volunteers (334 education, 86 health, and 13 agriculture Volunteers) in eleven projects in seven

countries (Afghanistan, Colombia, Iran, Philippines, Thailand, Tunisia and Turkey), concerning their impact.

We look forward to even greater use of measurement data in making decisions on programs. Since Peace Corps Volunteers serve two-year tours, the decision on whether to continue an activity is made by the Peace Corps at least every 24 months, permitting us to revise or initiate new programs more often than many other government agencies.

Our progress in measurement, however, does not mean that the Peace Corps has solved the many problems associated with programming. Some problems, in fact, cannot be solved by the Peace Corps alone, for they arise from the fact that the Peace Corps' duty is to serve—to serve people and agencies other than itself, and to serve governments other than the American government.

Peace Corps has no programs except the host country programs in which we participate. We act only on the invitation of governments, and our actions arise from their needs, not ours. We do not blindly follow the dictates of governments; neither do we create programs for them.

The foreign political arena is an area over which the Peace Corps has no control and effectively no influence, and properly so. Local politics including sudden changes of government, racial feelings, personal idiosyncracies, entrenched bureaucratic positions and international cold war suspicions occasionally arise as obstacles to effective Peace Corps programs. By maintaining close contact with local officials we seek to foresee and avoid programs which would be ultimately, if not immediately, detrimental to the Peace Corps and to the governments and communities concerned.

Another area which has continued to pose problems is in programming the American who volunteers for the Peace Corps. In 1961 no one could predict accurately exactly what trained manpower would volunteer for Peace Corps service or what sort of skills the interested nations would request.

The Peace Corps has always welcomed the technically trained and experienced Americans who were able to volunteer. We have placed them in programs where we have used their skills individually, or in programs where they can provide technical support to Volunteer generalists. For example:

David Kadane, a corporation lawyer at the height of his career volunteered and was assigned to Tanzania as a special assistant to the Attorney General. He negotiated contracts with a diamond mining concession and was a member of President Julius Nyerere's special seven-man commission which investigated the cooperative movement. His wife, Helen, is a trained nutritionist who had worked with the United Nations in New York. In Tanzania, she became head of the Freedom from Hunger campaign.

Frank and Edna Vaccaro had 16 years experience in raising rabbits before they became community development Volunteers in Guatemala. They began the rabbit co-op in Chimaltenango in 1965. Starting with 500 does the co-op produced some 15,000 rabbits in one year's time of which some 10,350 were sold for meat and pelts. The meat production has fostered a number of related small industries. Encouraged by their present success and by U.S. furriers who have confirmed the high quality of the pelts, the Vaccaros and Guatemalans look forward to expanding the rabbit co-ops.

In Chile, five professional Volunteer foresters are participating in a reforestation program in support of 35 Volunteers whose experience in this area was gained exclusively in Peace Corps training. The team works in erosion control and reforestation in conjunction with a Chilean agency.

In Iran teams, each consisting of a professionally trained architect, an engineer, and a Volunteer generalist trained by the Peace Corps in drafting and surveying, worked with the Iranian community development organization on the design and construction of public works projects.

We have learned that vast numbers of Americans who would like to volunteer their skills find it difficult to do so because of family and career commitments. The majority of our Volunteers, therefore, are young Americans volunteering two years of service between the end of college and the beginning of career and family formation. The central problem of Peace Corps programming has been to find ways to use effectively this non-technical resource to meet the technical needs of the developing world.

To solve this problem, we have worked with overseas governments to develop programs which focus on one segment of the technical job. We have developed programs for which we can provide the Volunteer the requisite skills during Peace Corps training which lasts an average of 12 weeks.

Approximately 1500 Volunteers, for instance, are working on major health problems, although no more than 18 per cent of these had medical training before entering the Peace Corps. We have long known that the Peace Corps would be unable to begin meeting the needs overseas for trained physicians or nurses. Indeed, public health specialists today could not meet these needs. We have tried, therefore, to develop ways to use the Peace Corps Volunteer as a medical auxiliary.

Under the medical supervision of the University of North Carolina and the Ministry of Health in Malawi—a nation whose president, Hastings K. Banda, is an American-trained physician and Ph. D.—a carefully controlled experiment was carried out. The Volunteers were trained to become technically proficient in the handling of one widespread and killing disease—tuberculosis. They learned to take case histories and conduct diagnostic laboratory tests. Once their diagnoses had been confirmed by a tuberculosis specialist, the prescribed course of medication was supervised by the Volunteers in the patients' homes. Family life was not disrupted, and scarce hospital beds were not used for the program.

This experiment by the Peace Corps and the Government of Malawi is of significance in the developing world. Formerly, tuberculosis was treated only by a physician whose 20 years of education qualified him to handle the whole gamut of man's ills—from broken legs to ulcers to the problems of birth. The Peace Corps learned in Malawi that a one-problem specialist could help make up for the lack of trained physicians.

The Peace Corps is applying the same technique to the technical problems of agriculture. Agriculture is the basis of almost all the economies in which we are working and is the full time occupation of most of the working population. Yet, in the United States, only 5½ per cent of our citizens are farmers, and all the universities of the United States turn out only 9,000 agricultural degree holders per year.

The Peace Corps found, therefore, that it could not provide the traditional type of agricultural extension agent who could advise on corn, wheat, garden vegetables, animal husbandry, irrigation, poultry raising, etc.

We learned, however, that we can teach a Volunteer about one or several related crops or other farm products so that he can assist a government engaged in an intensive program to increase the production of a particular crop.

Volunteers are thus joining the Government of India's program for grain production, principally sorghum and maize. In Nepal, the Philippines, and Sierra Leone, Volunteers work with intensive rice production programs.

To date, more than 400 Volunteers have helped India to establish a poultry industry in its villages. During one year alone, egg production, in areas assisted by Volunteers, more than doubled—from 366,000 to 1,000,000 eggs per week.

In the area of public works, by focusing on one aspect of the technical job, the Peace Corps has made it possible for Volunteers to build bridges up to 80 feet long in Tanzania and to span gorges in the Himalayas.

We feel we have been successful in training Volunteers in this technical work, and we are now explaining to other governments the ways in which Peace Corps Volunteers can be used to solve different types of technical problems.

Another problem area is in technical and professional support of the Volunteer. From the beginning, the Peace Corps has recognized the need for giving technical support to Volunteers, and much of this support has come from U.S. private institutions. The greatest contribution of the private sector has been in training Volunteers, but also of significance has been on-the-job technical advice without which the generalist Volunteer often could not operate.

To help provide day-to-day professional support to Volunteers, we have contracted with American colleges and universities, service organizations, voluntary agencies and private business for overseas representatives. These are called Contractor's Overseas Representatives (CORs). They are themselves professional experts, and in addition, they are able to tap the home resources of the contractor, including home office expertise, consultants, and programming capabilities.

Also providing on-the-job support to Volunteers are Program Technical Representatives (PTRs) who are professional personnel directly hired by the Peace Corps. Where professional backstopping by a contractor's organization in the United States is not required by the field situation, we use PTRs. The directly-hired PTRs have enabled us to achieve significant savings, and we now have more PTRs than CORs (78 PTRs to 41 CORs).

Volunteers also receive technical support by writing the Publications and Information Center (PIC) of the Peace Corps. PIC answers a yearly average of 3,000 requests for advice, and the office supplies basic technical reference materials throughout the Peace Corps.

Volunteers can correspond with specialists around the world through the auspices of VITA (Volunteer for International Technical Assistance, Inc.). A non-profit, private organization (sometimes called the "postal Peace Corps"), VITA puts Volunteers in touch with specialists who can give technical advice on specific development problems. It is expected that VITA will process more than 1,100 requests from the Peace Corps this year.

Some examples of such technical support provided by PIC and VITA :

A Volunteer in Colombia wanted to build a simple laser to demonstrate to chemistry students the physical characteristics of light. PIC provided the needed plans and information. Total cost for constructing the laser: \$1.15.

A Volunteer in Chile wanted to know how to write music in Braille. With the help of the Library of Congress and PIC, the Volunteer is teaching sighted teachers to write music in Braille and unsighted students to read it.

A Volunteer in Sierra Leone wanted to know if a bridge could be built out of cement and railroad rail. VITA provided the information by return mail. Consequently, bridges have been built in every district; in some districts there are dozens.

Various elements of the problems facing the Peace Corps have been with the agency since its beginning. As we have learned our job better, we have learned what we must do better. Like most of the work that the Peace Corps is doing, this requires time, effort and patience. Somehow, things seemed simpler four generations of Volunteers ago, possibly because of the high drama surrounding them. Here is how a Volunteer recently described it from his post in Africa :

"The first Volunteers probably had a wilder and, perhaps, a more interesting time and were accepted immediately because of the Peace Corps 'idea,' whereas present Volunteers have to prove themselves by their deeds, not by their novelty value . . . It seems that we are beginning, only beginning, to prove ourselves, and the Volunteers who come after us in the next years will have even a better chance to improve upon this general trend. Hopefully our legacy will provide future Volunteers with better direction . . ."

Many of the new directions of Peace Corps work began with the long range programming exercise launched in 1966.

Source : Peace Corps congressional presentation, fiscal year 1969.

PROGRAM MEMORANDUM REVISION

APRIL 8, 1968.

Memorandum to: All field representatives
From: Paul Sack, OPR
Subject: Program memorandum revision

Every Peace Corps country is different, and every Country Director has different programming problems.

A realistic Program Memorandum, which describes the particular problems of programming in your country and lays out both the expectations of host country nationals and your own plans for the development of the Peace Corps in your country, can be a great assistance to us in understanding your program submissions and therefore a great aid to you in the program review process.

The PM should not be a paper "exercise". It should be the place where you and your staff and Volunteers and—most important of all—host country nationals set forth the plans for the Peace Corps in relation to all the various programming constraints and development plans.

The attached description of the Program Memorandum is lengthy because it attempts to answer all the various questions that have been raised by many of you in the past. We are trying also, with these instructions, to give you individual comments on your existing Program Memorandum, directing your attention to the particular points which seem to need further analysis.

To make the planning as realistic as possible, we have shortened to three years the period of time into which we ask you to project. We hope to make some early programming decisions for you on the basis of these PMs, so that you can make earlier commitments to the Ministries with whom you deal.

Please bring your staff and Volunteers and host country government or agencies in on your planning. Please make it as realistic as you can. And

please remember that it is from this document that the people here who will review your program proposals will get their information about the unique situations in your country and what it is that you and the host country are planning to do with the Peace Corps.

In order for us to do any advance planning in Recruiting and Financial Management and to meet our deadlines with the Bureau of the Budget, it is important that we receive the PMs in OPR by July 1; thus, I imagine your Regional Director will want them to arrive in Washington by early June.

If there is any further information we can give you about the PM or if you have any ideas on which you would like to correspond concerning the entire planning and program review operation, I would be most happy to hear from you and guarantee you both attention and a prompt answer.

Attachment: Program memorandum instructions.

Memorandum to: All field representatives
 From: Paul Sack, Director, OPR
 Subject: 1968 program memoranda

This memorandum is intended to explain the role of the Program Memorandum (PM) in Peace Corps programming and to establish the guidelines for the 1968 PMs.

The purpose of the Planning and Programming system within the Peace Corps remains as previously stated in the 1966 guidelines:

To make explicit the aims and the objectives of each of the country programs and of the Peace Corps as a whole, in light of the major problems facing the world in the years ahead, and as a part of an effort to assure that the Peace Corps Volunteers are effectively engaged in the most important and therefore the most satisfying work that can be done abroad.

As you know, the Program Memorandum focuses on the "formal job" of the Volunteers. It is in no way implied that this is the only or the major aspect of the Peace Corps experience and overseas directors are encouraged to discuss the other aspects in their PMs as well, and to suggest ways in which they can be more fully incorporated into future Program Memoranda. However, the formal job is a necessary condition for achieving other Peace Corps goals such as changing fatalistic attitudes and encouraging mutual understanding.

Information contained in the Program Memorandum will be used in the following ways:

1. To understand and evaluate the direction of Peace Corps programming worldwide, within regions, and in each individual country;
2. To help make decisions on the allocation of Volunteers (and most immediately, in making the Summer 1969 conditional matrix);
3. To estimate and reinforce budget requests to the President and the Congress;
4. To aid Recruiting and Selection in meeting your future requests;
5. To assist Regional Training Coordinators in planning for 1969 Training programs.

Peace Corps planning turns on these two dates and on the dates of issuance of three annual Volunteer Allocations (Matrices). The schedule outlining approximate dates for the submission of various Plans and Studies and for their review is outlined in Section 5 of this memorandum. This schedule replaces the documentation schedule issued on June 14, 1967 by OPR.

The Program Memorandum is a principal element in the program review process. In reviewing the specific Project Description (104) and considering it for the matrix, the Program Memorandum is used to ascertain how the proposed project relates to the country strategy. The PM is used extensively throughout the review process to develop an understanding of the assumptions and decisions upon which the proposed Project Description is based.

After writing Program Memoranda for the past two years, a number of Country Directors made recommendations on revisions in the PMs which should increase their usefulness as planning documents. OPR and the Regional Program Officers have also suggested improvement on the basis of their experience. Many of these have been included in the current guidelines.

The tone of early instructions suggested to some Directors that the Peace Corps was a self-contained force for economic development. We seemed to be asking for a plan, thought up by the overseas Peace Corps staff, for developing that country. Nothing could be further from the truth.

The Peace Corps' job goals are always shaped by the goals of our hosts. Appropriate host country officials should be involved extensively in the development of the PM. In analyzing the problems which lend themselves to Peace Corps type projects, it is imperative to ask what the host country is going to do about them. Host country nationals, Volunteers and staff should all be involved together in the process of setting country program objectives, and specific project objectives.

The issue of the classification of the PM has been raised repeatedly in the last year. This matter has been discussed with the Bureau of the Budget and their guidance has been that the PM is a planning document that once written is LOU and cannot be shown to anyone who is not part of the Executive Branch of the Government. This should not prevent anyone from discussing portions of the PM with Host Country Nationals, e.g., what the objectives of the Peace Corps should be in secondary education, etc.

A second change from last year will be in the time horizon. Directors, knowing the practical problems of getting firm requests from a country only one year in advance, took exception to projecting Volunteers, however tentatively, for five years. We have reduced the projection period to three years, the minimum for sound planning for PC/W purposes. The projection tables will be used to help allocate Volunteers for program year 1969, to budget for FY 1970, and to indicate whether replacements will be needed for Volunteers going overseas during 1968 and 1969. The closer the planning is to the realities of the host country, the experience of Peace Corps Volunteers and the hopes of the host country government, the better it will become. There will be many limitations on what the Peace Corps can do in a particular country—political, bureaucratic, and practical. These should be stated in detail for us to understand the reasoning and practical considerations behind your program submissions and attainable plans.

In addition to seasonal requirements by project, we are asking for a Volunteer skill breakdown for 1969. This is an improvement over previous years. It will be possible to provide Recruiting data on the needs for each country seasonally. Hopefully, this will produce an even more rational approach to the expenditure of our Recruiting dollar. It will also provide an easy and efficient way to compare skill requirements for similar projects across country and regional boundaries.

This year we have attached a form for projecting your staffing pattern for the next three years. This should aid both the overseas staff and Washington to better relate Volunteer projections with their support needs. Keep in mind that the Peace Corps worldwide staff ceilings established as a result of the current BALPA exercise will be maintained through June 30, 1969, and perhaps beyond. There will be a limited amount of latitude in the form of possible personnel transfers between countries, and those PMs calling for materially increased programs should therefore include a clear statement under question 2 (What are the limitations on the Peace Corps?) outlining the number and type of additional staff required. Those PMs not containing such a statement will be taken to indicate that the proposed programs can be carried out with existing personnel.

Finally, the size of the PMs varied greatly in the past, a few only 15–20 double spaced pages, and some over one-hundred. It is always more difficult to write an excellent short paper than a longer one, yet we don't want to put any unnecessary restrictions on length in either direction. It is expected, however, that most papers will run no more than 50 double spaced pages. Each PM should be accompanied by a summary of not more than four pages.

This memorandum is organized into five sections. Section I outlines the desired content of the narrative portion of the Program Memorandum. The PM is summarized by a series of tables dealing with the size and program composition of the Peace Corps over the next three years as it can best be predicted on the basis of all practical considerations, the skills required and desired for each proposed project in 1969, and the number and kind of staff support the program needs in the next three years. Each of these tables are explained in Sections II, III and IV respectively. Section V contains the Documentation Schedule.

I. PROGRAM MEMORANDUM

The request to the Congress for fiscal 1969 is \$112.8 million which is enough money to support 9,200 trainees. This request represents a 15 percent increase in

trainees over fiscal year 1968. It is difficult to project the overall size of the Peace Corps in 1970 and 1971 as so many factors are involved. In writing the PM this year, however, it is not unrealistic to assume that the Peace Corps will increase by 10 percent each of those years. The possibility certainly exists that many countries will decrease in size while others may increase by as much as fifty percent and still others not increase at all.

The composition of the Peace Corps, at the same time, is expected to remain roughly the same over the next three years, i.e., at least 85 percent of all trainees will be recent college graduates. In this connection, a safe assumption to make is that your programs will contain a limited number of specialists as they have in the past. It is becoming increasingly clear, though, that the Peace Corps must define the technical job narrowly enough so that a generalist can be trained in a twelve to thirteen-week training program to perform the technical task. We cannot expect to provide general agriculture extension agents or Volunteer physicians in large quantities, but we can provide Volunteers who have training in one or two crops or one aspect of a health problem.

It is expected that any forecasts will be developed with host country participation. The PM should make clear the extent to which individual programs have host country approval and support.

The narrative section of the Program Memorandum should be divided into seven sections corresponding to the seven questions to which you are asked to respond. In writing the Program Memorandum one should move from the general to the specific as quickly as possible. You are encouraged to be specific and precise in the statement of problems which the Peace Corps will confront and the objectives set in regards to those problems. The questions are as follows:

(1) What are the Major Problems Facing Your Country In the Foreseeable Future?

The purpose of this section is not to list every conceivable problem facing the country but to select those problems which seem to be major ones which must be resolved in order to reach any level of development.

Wherever possible this section should avoid simply being a justification of previous Peace Corps emphases but rather present a fresh look at the country and the most difficult challenges it is facing and will face during the next few years. Background information on the country, including detailed historical, political and economic data, is not necessary except as it may directly affect Peace Corps programs.

This section should be as specific as possible in its program analysis. For example, if agricultural production is low there are elements of this problem which can be identified for further analysis. Insufficient grain production may be one element. Others might be lack of irrigation, farm-market roads, storage facilities, fertilizers, extension personnel to teach better farming methods, etc. The elements of the problem should be presented and used later in setting objectives and comparing alternative projects.

(2) What are the Limitations on the Peace Corps?

This section should contain a frank discussion of the factors which influence the total country program strength, the choice of program areas and the composition of the Peace Corps program at present and within the near future. If the limitations on the Peace Corps are of a host country nature—either political, or bureaucratic, or a matter of resources—they should be pointed out. If the constraint is the Ambassador or the country team position this should be mentioned. If it is clear that the constraint is due to the nature of the Peace Corps, i.e., quality of the Volunteers arriving in-country, staff support, lack of money for program support, or some other relevant point, then discuss those.

(3) Which of the Major Problems Facing the Country or Which Elements of These Problems Lend Themselves to Peace Corps Programming?

This section should focus on a discussion of why certain of the particular problems or problem elements outlined in section one are being selected as program areas for the Peace Corps.

Some of the most critical problems may not lend themselves in any way to Volunteer solutions. It is difficult to see how the Peace Corps could help to correct sharp fluctuations in a country's foreign exchange rate, day-to-day political unrest, or crippling strikes. The Peace Corps may not be able to help in certain problem elements, e.g., land reform where legislation by the host country government is the pre-condition for projects in this area, or in general farmer education if Peace Corps would have to work alone without counterparts or agency support.

At the same time, problems new to the Peace Corps need not be ruled out. You should feel free to approach problems which may require cooperation with volunteer programs of other U.S. public and private agencies, organizations of developed and developing nations, and international organizations.

The major needs of the country will have now been indicated and Peace Corps limitations specified. A ranking of Peace Corps priorities in this country will result from your weighing of two factors: 1) the *importance* of the problem area to the country (the degree of "need"), and, 2) the *capability* of Peace Corps to make a significant contribution. The reader should be able to understand your ordering of Peace Corps programming priorities for problem areas and the basis for that ordering.

(4) Within These Problems Susceptible to Peace Corps Programming What Specific Objectives Can the Peace Corps Set for Itself?

The objectives should be stated with enough precision so that there is some basis for assessing progress by yourself or others over a reasonable period of time. Hopefully, the objectives will be expressed with enough specificity that it will be clear to any host country national what Volunteers working in that area are attempting to achieve, and whom they are working with, e.g., "to increase grain production by introducing Mexican wheat to 5,000 farmers in the highlands through the Ministry of Agriculture."

Programs should not be distorted by selecting objectives and programs just because they are easily quantified. The objectives set should be responsive to the problems of the country, but they should be stated in terms of recognizable goals which permit assessment of progress made toward the objectives set.

This section should state objectives for each problem area in which activity is contemplated. For purposes of analysis Peace Corps activities fall into seven problem areas:

- (a) Agriculture
- (b) Education
- (c) Health
- (d) Small Business Development
- (e) Professional Services
- (f) Community Development
- (g) Public Works

(5) What Alternative Projects Would Achieve the Objectives in the Problem Areas and What Are the Project Objectives?

This section is not intended to list every conceivable alternative, but only those that directly relate to achieving the stated problem area objectives, and which are possible Peace Corps projects given the constraints you have described for programming in your country and Peace Corps capability.

A project is defined as a specific set of related activities with a common objective to be performed by a number of Volunteers who can be trained and assigned as a group. (It's quite possible for two distinct projects to train at the same site but for different purposes.)

Examples of project objectives in the Health area might be "to introduce nutritional food supplements to 1,000 urban mothers, with counterparts, in cooperation with the Ministry of Health" or "to promote forty viable mothers clubs through the National Welfare Agency." In the Agriculture area the project objective may be "to conduct 25 demonstration plots of Mexican wheat in conjunction with 10 host country extensionists in twenty villages in the highlands, through the Ministry of Agriculture."

(6) How Do These Alternative Projects Compare in Terms of Effectiveness and Host Country Involvement? Which Alternatives are Better?

Each alternative project should be compared in terms of its likelihood of achieving the problem area objectives which you set. For example, the objective in the Education area may be "to double the number of qualified teachers in primary education." There are perhaps three ways the Peace Corps can help achieve that objective; by sending primary school teachers; which produce twenty five percent of the domestic supply of primary teachers; by providing Volunteers to set up an Education Television system as a method of in-service teacher training. The feasibility and advantages of the alternatives should be compared, considering for example, whether the alternative which takes twice as many Volunteers is twice as effective as the one which does not.

(7) *List the Problem Area Objectives and the Projects Within Them In Such A Way as to Indicate Priorities.*

In section 3 you gave a priority ranking of problem areas for Peace Corps programming in your country. Section 7 asks for a final ranking at a higher level of specificity. This section should indicate the order of priority of specific individual projects.

Simply stated, your answers to the seven questions of the narrative portion of the PM should give the reader an understanding of your strategy for the next three years and an understanding of your reasoning and evidence for choosing that strategy over alternative ones.

II. PROJECT FORECAST

Appendix A to your Program Memorandum should give your estimate of Volunteers required for the chosen Problem Areas and Projects over the period 1968-1971. A format to use in developing those projections is attached to this memorandum.

A single page has been allowed for each program year projection. (The program year is used for planning purposes.) This is to insure that your projections are not misinterpreted and to allow for precise planning figures for recruiting, selecting and budgeting purposes. The program year runs from September 1 to August 31, thus program year 1969 starts on September 1, 1968 and ends on August 31, 1969. You are requested to forecast the number of Volunteers you want to train in a given season, and the number of Volunteers in-country (not trainees) on two specific dates: June 30 (end of fiscal year) and August 31 (end of planning year). Any forecasts made are meaningless unless they are tied to these two dates as it is impossible to calculate accurately from Washington. To arrive at the planned number of Volunteers in country on those two dates, the number of Volunteers who will have completed their service should be subtracted and those who will have finished training added to the current strength in order to arrive at the number of Volunteers in-country. Give minimum and maximum ranges only if they aid you in forecasting. Always use a Volunteer figure. Do not use the trainee figure in any of the tables.

A comparison of last year's Program Memoranda with each other and with OVS reports revealed a number of inconsistencies in applying category labels to particular problem areas and projects. In order to develop meaningful statistical reports and valid projections it is important that both be consistently labeled. The following pages outline the program structure of the Peace Corps. This listing defines and expands the problem areas previously used. The list includes representative projects within the problem areas for illustrative purposes.

Categories have been grouped so that activities are problem-oriented. To classify a project, you should ask "which problem is the project designed to attack?" To help you, we have defined each of the problem areas and have included pertinent examples from last year's Program Memoranda to illustrate the projects.

In completing Appendix A please note that each of the different problem areas and projects within them should be stated. You will probably find that the examples given cover most of your projects. If not, fit the new category you devise into one of the seven problem areas and avoid such nondescriptive categories as "Other," "Special Projects" or "New Projects."

Some Country Directors have described a project by giving the name of the agency the Volunteers would assist. It is more important to know the function of the Volunteers themselves, not the agency to which they are attached, except as it may be added as clarification. The simplest and clearest procedure is to note the project activity and set off agency titles or other explanation by stroke lines (/) or parentheses, if you feel it necessary. It is important to use the project label and the problem area involved when you are requesting Volunteers in the Project Description (104). This will avoid misinterpreting who is doing what in your country.

The program structure of the Peace Corps includes seven problem areas. This represents a departure from the past. The problem areas and projects are defined as follows:

1. *Agriculture*—The primary job objective is to perform tasks in pro-

ducing, storing, and marketing food for home or school use. Projects in the problem area are as follows:

(a) *Agricultural Extension*—The primary job activity of Volunteers is helping to adopt better ways to grow and use food. Specific responsibilities may focus, for example, on: Livestock, Dairy production, Poultry and pigs, Beekeeping, Food crops, Farmer education, Farm management, Fisheries, Forestry, Wildlife and game conservation, and Disease control.

(b) *Agricultural Cooperatives*—The primary job activity of Volunteers is the establishment, operation, and management of producer and/or marketing cooperatives.

(c) *Agricultural Public Works*—The primary job activity of Volunteers is helping to undertake public works projects principally needed for agricultural development. For example: Water supply (tubewells and irrigation), Farm Machinery maintenance, Construction of farm buildings or structures, Construction of feeder roads.

(d) *Community Development/Agriculture*—The primary job activity of Volunteers is to stimulate attitudinal change, using an agricultural skill as the lead skill. In some cases Volunteers who are Generalists may be supported by Volunteers with agricultural degrees or background. Specific activities may focus on: School Gardens, Rice Production, etc.

2. *Education*—The primary job objective is to perform tasks in teaching, teacher training, administration, and educational technology. Projects in this problem area are as follows:

(a) *Pre-School*—The primary job activity of Volunteers is educating pre-school aged children. The principal function of Volunteers as teachers, administrators, etc., should be indicated.

(b) *Elementary*—The primary job activity of Volunteers is educating host country nationals in an elementary school. The major course content where relevant should be indicated. For example: English (or TEFL, TESL), math, physical sciences, biological sciences, social sciences, history, geography, commercial arts, industrial arts, home arts, physical education, art, music, and special education.

(c) *Secondary*—The primary job activity of Volunteers is educating host country nationals in a secondary education institution. The major course content should be indicated. For example: English (or TEFL, TESL), math, physical sciences, biological sciences, social science, history, geography, commercial arts, industrial arts, home arts, physical education, art, music, special education.

(d) *University*—The primary job activity of Volunteers is educating host country nationals in Universities. The major course content should be indicated. For example: English (TEFL, TESL), math, physical sciences, biological sciences, social science, history, geography, commercial arts, industrial arts, home arts, physical education, art, music, and special education.

(e) *Vocational Education*—The primary job activity of Volunteers is teaching occupational or vocational trades (as contrasted with pre-vocational "industrial arts" which would be listed in one of the preceding categories).

(f) *Adult Education*—The primary job activity of Volunteers is educating adults in special programs once they have left school. For example: Literacy education, Educational radio.

(g) *Teacher-Training*—The primary job activity of Volunteers is training teachers or future teachers. If training is in-service the level of education should be indicated. For example: Pre-school teacher training, Elementary teacher training; Secondary teacher training, Teacher-Training institutes, Curriculum preparation, Utilization of ETV.

3. *Health*—The primary job objective is to help meet the health problems of the host country.

(a) *Environmental Health*—The primary job activity of Volunteers is promoting better health by improving the community environment. Specific responsibilities may focus, for example, on: Water supply, Soil contamination control (sewage), Pest Control.

(b) *Health Education*—The primary job activity of Volunteers is improving the health of the community through education and related activities. For example: Health education/nutrition, Maternal and child health/nutrition.

(c) *Special Disease Programs*—The primary job activity of Volunteers is controlling disease. For example: Malaria, Tuberculosis/BCG, Schistosomiasis, Filariasis, Leprosy.

(d) *Family Planning*—The primary job activity of Volunteers is promoting family planning through promotional campaigns and clinical work.

(e) *Training of Medical and Para-Medical Personnel*—The primary job activity of Volunteers is training doctors, nurses or para-medical personnel. The particular focus of training should be indicated.

(f) *Professional Service*—The primary job activity of Volunteers is to fill professional positions within a medical institution or related agencies.

4. *Small Business Development*—The primary job activity of Volunteers is to help increase monetary profit or savings for host country participants through efficient and effective entrepreneurship. For example:

- (a) Consumer cooperatives
- (b) Credit cooperatives
- (c) Small industry counselling
- (d) Tourism Development
- (e) Handicrafts

5. *Professional Services*—The primary job activity of Volunteers is performing a skilled job in an agency which enables the agency to carry out or extend its activities. For example: City planning, Architecture, Legal services, Public Administration, Accounting, Meteorology, Librarianship, Secretarial service, Museum curator.

6. *Community Development*—The primary job activity of Volunteers is to stimulate attitudinal change and encourage self-help, support community institutions or extend the resources of the national government by employing OD techniques. For example:

- (a) Rural Community Development
- (b) Urban Community Development

7. *Public Works*—The primary job activity of Volunteers is in surveying, designing, maintaining, or building public non-agricultural infrastructure or equipment. For example:

- (a) Surveys
- (b) Design of Public Works
- (c) Maintenance of Public Works
- (d) Construction of Public Works

III. SKILL FORECAST

Appendix B to your Program Memorandum should illustrate your estimate of the skills required for the projects you will be requesting for the Spring of 1969, the Summer of 1969 and the Fall of 1969 only. We are attempting to make a realistic appraisal of skill needs prior to the start of the 1969 Recruiting effort so as to plan accordingly.

You should recall the same realistic assumptions that were mentioned in the instructions for the narrative portion of the PM in completing this table. Under no circumstances will you be held to your projections when you submit an actual project description. These should just be your best and most realistic estimates. The skill projections should be identified by the same project name used in Appendix A. Give minimum and maximum ranges if possible.

IV. STAFF FORECAST

The PM should include an Appendix C which outlines your staffing needs through June 30, 1971. The analysis should indicate:

(1) the number of Direct Hire personnel presently on board June 30, 1968, by function, e.g., Director, Deputy Director, Associate Director, Program/Training Officer, Administrative Assistant, PTR Agriculture, Medical Doctor, etc.

(2) the number and the function of staff needed to support the number of Volunteers in country on June 30, 1969, June 30, 1970 and June 30, 1971.

If your projections anticipate a lower or higher ratio of Volunteers to the present staff level in the country indicate the reasons for the change in the narrative portion of the PM under question 2. (Do not include local hire in this table unless HONs are filling PTR or APCR positions.)

V. DOCUMENTATION SCHEDULE

May 15. Final date for draft 104s for Fall Matrix to be submitted to OPR by Regions.

June 3. Fall Matrix issued.

July 1. Draft Program Memoranda due in OPR where they are reviewed, evaluated and discussed with Director, Recruiting, Selection, Regional Directors, Financial Management and Administration.

July-August. Review and comments on draft PM presented to Country Directors throughout July and August.

July 30. Submission of selected Program Memoranda to the Bureau of the Budget.

August 5. Regional strategy papers based on Country Program Memoranda due in OPR.

August 30. Submission of selected Program Memoranda to the Bureau of the Budget.

September. Final Agency-wide review on Program Memoranda, Special Studies and Regional strategy papers.

September 9. Final date for draft 104s for Spring Matrix to be submitted to OPR by Regions.

September 30. Issuance of Spring Matrix.

September 30. Final submission to Bureau of the Budget of Program Memoranda and Special Studies.

October 14. Issuance of conditional Summer Matrix built on the Program Memoranda to the field for concurrence.

November 18. Final date for draft 104s for projects on the conditional matrix to be submitted to OPR by the Regions.

November 18. Final date for draft 104s for pre-July 4 starts (to be considered for first part of Summer Matrix) to be submitted to OPR by the Regions.

December 1. First part of Summer Matrix issued, incorporating revised conditional matrix and pre-July 4 starts approved.

APRIL 22, 1968.

Memorandum to : All Field Representatives

From : Paul Sack, OPR

Subject : Program memorandum revision

Unfortunately the following paragraph was omitted when the 1968 PM guidelines were reproduced. The following paragraph should be inserted at the bottom of page 2.

"The processing of this information is done at two points in the year. Every June the Peace Corps Director is expected to make an estimate to the Bureau of the Budget regarding the size of his budget request. Jack Vaughn will have to estimate the size of his fiscal 1970 budget request in June, 1968. In October, 1968 the June estimates will be refined and spelled out in lengthy detail with supporting documents."

APPENDIX A

PROJECT FORECAST FOR _____
(Country)

Problem Area	Project Name	No. Volunteers who started trng. 9/1/67 thru 12/31/67	No. Volunteers who started trng. 1/1/68 thru 5/30/68	No. Volunteers to start trng. in June 1968	No. Volunteers in-Country 6/30/68 ^{1/}	No. Volunteers to start trng. July-Aug. 68	No. Volunteers in-Country 8/31/68 ^{2/}

1/ Indicate which Spring training projects are included in the 6/30/68 strength figure.
2/ Indicate which June training projects are included in the 8/31/68 strength figure.

APPENDIX A

PROJECT FORECAST FOR _____
(Country)

Problem Area	Project Name	No. Volunteers to start trng. 9/1/68 thru 12/31/68	No. Volunteers to start trng. 1/1/69 thru 5/30/69	No. Volunteers to start trng. in June 1969	No. Volunteers in-Country 6/30/69 ^{1/}	No. Volunteers to start trng. Jul-Aug. 1969	No. Volunteers in-Country 8/31/69 ^{2/}

1/ Indicate which Spring training projects are included in the 6/30/69 strength figure.
 2/ Indicate which June training projects are included in the 8/31/69 strength figure.

APPENDIX A

PROJECT FORECAST FOR _____
(Country)

Problem Area	Project Name	PROJECT FORECAST FOR _____ (Country)				
		No. Volunteers to start trng. 9/1/69 thru 12/31/69	No. Volunteers to start trng. 1/1/70 thru 5/30/70	No. Volunteers to start trng. in June 1970	No. Volunteers in-Country ^{1/} 6/30/70	No. Volunteers to start trng. July-Aug. 1970

^{1/} Indicate which Spring training projects are included in the 6/30/70 strength figure.
^{2/} Indicate which June training projects are included in the 8/31/70 strength figure.

APPENDIX A

PROJECT FORECAST FOR _____
(Country)

Problem Area	Project Name	No. Volunteers to start trng. 9/1/70 thru 12/31/70	No. Volunteers to start trng. 1/1/71 thru 5/31/71	No. Volunteers to start trng. in June 1971	No. Volunteers in-Country 6/30/71 ^{1/}	No. Volunteers to start trng. July-Aug. 1971	No. Volunteers in-Country 8/31/71 ^{2/}

1/ Indicate which Spring training projects are included in the 6/30/71 strength figure.
2/ Indicate which June training projects are included in the 8/31/71 strength figure.

APPENDIX B

Skill Forecast for _____
(Country)

Project Name	
Spring Training Starts 1/1/69 thru 5/31/69	Home Ec. maj. deg. Home Ec. min/bkgd. Civil Eng. maj. deg. Mech Eng. maj. deg. Chem. Eng. maj. deg. Elec. Eng. maj. deg. Other Eng. deg. maj. Forestry, Conser. Medical skills Para-medical skills Geology-maj. degree Lawyer-degree City Plan. maj. deg. Architecture maj. deg. Fisheries Social work-maj. deg. Bus. Adm. Econ. Graduate Gen. AB gen'l-male, deg. AB gen'l female deg. AB gen equiv-male no degree AB gen equiv-female no degree Sub AB-Generalist no Degree
Summer Training Starts 6/1/69 thru 8/31/69	
Fall Training Starts 9/1/69 thru 12/31/69	

POLICY AND CRITERIA FOR PEACE CORPS PROGRAMMING

General Statement of Principles:

The Peace Corps provides Americans with the opportunity to work together with people of other nations in meeting important problems which affect their hosts' lives and well being. The Peace Corps is built on the premise that people achieve better understanding when they are working together toward common goals. When Peace Corps Volunteers share the daily lives and aspirations of their hosts and neighbors, true mutual cross-cultural understanding occurs. Peace Corps programs should provide the framework within which these processes may occur. Programs are judged mainly on the basis of whether they bring Peace Corps Volunteers and host country nationals together to work in an effective way on important problems and whether they provide Volunteers and host country nationals with the opportunity to come to know and understand one another.

Volunteers are action and problem oriented people who volunteer for the Peace Corps with mixed motives. One overriding motive is clear. Volunteers seek and desire involvement in areas of real need to the people of the host country. The Peace Corps should seek involvement in areas of high priority to the host country, and in those programs which the host country is actively working to overcome recognized problems. A vital criterion for Peace Corps programs is that they be addressed to problems seen as being of priority importance by the Peace Corps Volunteer, the host country people and their government.

The Peace Corps is people-oriented. Volunteers should come to know host country people in a real and meaningful way. It is also an important criterion for Peace Corps programs to provide the Volunteer with the opportunity to come to know and be known by host country nationals in ordinary daily living without the sort of artificial barriers which preclude mutual understanding.

A. THE PROGRAM

1. Peace Corps programs should be integrated as closely as possible with host country work. Ideally, there are no Peace Corps programs, but host country programs with Volunteer assistance. All program development should involve Volunteers and host country nationals to the maximum possible extent.

2. Peace Corps programs should reflect the experience of Peace Corps and other agencies working in the problem area, either in the host country or elsewhere.

3. Programs should be within the realistic capabilities of Volunteers. Country or regional program strategy should be based on careful review of alternate means of reaching chosen objectives in the problem area.

4. Program objectives should be clearly understood by Peace Corps Volunteers and staff, host country government and people.

5. Before completing their service, the Volunteers together with the staff should evaluate in writing what the group has accomplished. This discussion should take note of the original objectives of the program and, if possible, should include appropriate host country nationals.

B. THE VOLUNTEER

1. The Volunteers' jobs should involve them with host country nationals on a daily working basis. Volunteers should be living in circumstances which afford opportunities of coming to know host country neighbors and friends in normal day-to-day situations. Volunteer housing, living allowances, job assignments, vehicle and travel policy, and other facets of Volunteer life should have as a priority object the maximum possible Volunteer-host country national contact.

2. The Volunteer should be assigned to a job whose nature and objective is clear to himself, his Peace Corps staff, host country supervisors, co-workers, and the host country nationals among whom he is living.

3. Thorough site surveys are essential, based on predetermined criteria for Volunteer assignment and acquainting job supervisors and counterparts with the nature, skills, and goals of the Volunteer. The Peace Corps should ensure that necessary professional job and material support will be available.

4. Volunteers should be able to see achievement during their two years in their assignment. They desire it.

C. PARTICIPATION BY HOST COUNTRY NATIONALS

1. The more complete the involvement of the host country and its citizens in the Peace Corps program, the more productive is the Peace Corps likely to be. Success in promoting mutual understanding and receptivity of the host country toward the project depend in large measure upon the degree of host country participation.

2. Each project must be requested by the government or approved agency of the host country and must be responsive to the needs of that country.

3. Preference is given to programs in which Volunteers work within host country institutions, both private and public, and are supervised by host country nationals.

4. Programs should involve maximum contact and involvement with host country counterparts. The Peace Corps should encourage the training of host country counterparts to perform the work now being done by the Volunteers.

5. Host country nationals should participate in the training of Volunteers whenever possible. This will normally be done during in-country training, but, in addition, it is desirable to use nationals during U.S. training to the extent possible. Their value will be maximized if arrangements are made for them to live with and participate in the informal activities of the Volunteers, in addition to their formal teaching duties.

D. PROGRAM REVIEW PROCESS

1. Once a program is developed through the interaction of Volunteers, staff and host country nationals, it is necessary to describe the program in a Project Description (104).

The better Project Descriptions are not necessarily the ones that are well written. On the contrary, those that truly reflect the field situation in meeting the criteria described above for good programming are the best.

2. The purpose of the program review process is to assure that Peace Corps Volunteers are assigned to the best programs available. Almost always, there are more program requests than there are qualified trainees. Competition is keen. There is no substitute in this process for a true description of the field realities. If a thorough job has been done of developing this program as outlined above, the document will be easy to write and to understand. Success is not defined as getting a project approved. Rather, success lies in assigning all Volunteers to the best jobs we can develop on the basis of seven years of Peace Corps experience.

3. The Director of the Peace Corps has delegated the preparation of the matrix allocation of the Peace Corps' scarcest resource, the Volunteer, to the Office of Planning, Program Review, and Research. The culmination of the program review process is the releasing of an Approved Program Plan (matrix) four times

a year to cover the training seasons, Spring, Summer I, Summer II, and Fall. A flow chart indicating the steps in the process is as follows:

Volunteers - Staff - Host Country Nationals

Project Description (104)

Regional Review of all Project Descriptions

--Regional Review determines whether proposed project is forwarded to OPR

OPR - Review of all Project Descriptions

--ascertaining that projects meet criteria for good programs
--matching of programs to Selection's estimates of trainee availability
--consultation with Operations Officers, Regional Program Officers, and overseas staff
--OPR recommended matrix issued to Regional Directors for comment and consultation

Matrix Presented to Director for Approval With Summary of any Unresolved Issues

Director Issues Matrix



PLANNING—PROGRAMMING—BUDGETING

HEARINGS
BEFORE THE
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS
OF THE
COMMITTEE ON
GOVERNMENT OPERATIONS
UNITED STATES SENATE
NINETY-FIRST CONGRESS
FIRST SESSION

PART 5

WITH
DR. JAMES R. SCHLESINGER, ACTING DEPUTY DIRECTOR,
BUREAU OF THE BUDGET

DECEMBER 10, 1969



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WASHINGTON : 1969

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PLANNING—PROGRAMMING—BUDGETING

WEDNESDAY, DECEMBER 10, 1969

U.S. SENATE,
SUBCOMMITTEE ON NATIONAL SECURITY
AND INTERNATIONAL OPERATIONS,
COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

[This hearing was held in executive session and subsequently ordered made public by the chairman of the subcommittee.]

The subcommittee met at 10 a.m., pursuant to notice, in room 3112, New Senate Office Building, Senator Henry M. Jackson (chairman of the subcommittee) presiding.

Present: Senators Jackson, Gurney, and Stevens.

Subcommittee staff members present: Dorothy Fosdick, staff director; Robert W. Tufts, chief consultant; Richard N. Perle, professional staff member; Judith J. Spahr, chief clerk; Richard E. Brown, research assistant; and William O. Farber, minority consultant.

OPENING STATEMENT OF THE CHAIRMAN

Senator JACKSON. The subcommittee will be in order.

In the 90th Congress, our subcommittee conducted the first major Congressional inquiry into the planning-programming-budgeting system, applied in the Department of Defense starting in 1961 and formally extended to other major federal departments and agencies by President Johnson's directive of August 25, 1965. The focus of the subcommittee's work has been on the PPB effort in the national security area.

In its study, the subcommittee examined the pitfalls as well as the possibilities in the use of program budgeting, systems analysis and cost-effectiveness methods. We sought through hearings, studies and memoranda by eminent authorities to get the basic questions relating to these tools and management devices out on the table, to encourage, to the extent possible, sound judgment in their application.

Following on this earlier inquiry, the subcommittee has continued to monitor the application of program budgeting and analysis in national security affairs.

The purpose of our hearing today is to take stock of the government's PPB effort since January 1969. There are bound to be some lessons to derive from the new Administration's first year of experience with planning, program budgeting and analysis.

To help us interpret that experience, we are particularly fortunate to have the counsel of Dr. James R. Schlesinger, Acting Deputy Director of the Bureau of the Budget. Teacher of economics and analyst

of defense management and strategy, Dr. Schlesinger served as Director of Strategic Studies at the RAND Corporation prior to joining the government.

The subcommittee is well aware of Dr. Schlesinger's ability to cut through to the heart of problems. His memorandum on "Uses and Abuses of Analysis", contributed to this inquiry in April 1968, was widely read and reflected upon in this country and abroad in both government and university circles. I recall in particular his closing comment in that memorandum:

Admittedly, analyses vary substantially in quality. Each should be taken with a large grain of salt. On the other hand, if one does not demand too much of it, analysis will prove to be a most serviceable instrument.

We are pleased that you could join us here this morning, Dr. Schlesinger. You may proceed in your own way.

**STATEMENT OF DR. JAMES R. SCHLESINGER, ACTING DEPUTY
DIRECTOR, BUREAU OF THE BUDGET**

Dr. SCHLESINGER. Thank you, Mr. Chairman.

Mr. Chairman and members of the committee: It is a pleasure to appear before this subcommittee, which has done so much to illuminate both the strengths and the problems of the PPB system, and to discuss with you the new trends and changing emphases regarding PPB that are under way in this Administration. What I have to say this morning is in the nature of an interim report. I shall discuss the aspirations, the issues, and the dilemmas, as we currently see them. But these perspectives will need to be updated: first, as we complete the preparation of the 1971 Budget, the initial one for this Administration, and, second, as the Administration shapes its longer term objectives.

Later in my testimony I shall develop in greater detail the basic attitudes of the Administration toward PPB—in relation to other tools for improving the effectiveness of Government operations. At the outset, however, I want to make clear that the effective use and further development of PPB techniques have President Nixon's wholehearted support. A prime objective of the President is the modernization of the Federal bureaucracy or, put more precisely, if less colorfully, the improved management of the Executive Branch.

The Budget Bureau's Bulletin 68-9 continues in force, and the agencies have recently been reminded by the Director of the need to comply with its objectives and procedures. More broadly, the Administration regards PPB as the latest in an historical sequence of nonpartisan efforts to improve the management of the public's business. By way of the historical antecedents of PPBS, I might mention that P.L. 84-801, requiring five-year cost projections for new programs, was adopted at the behest of the Eisenhower Administration, and that the earliest, official endorsement of program budgeting was given by the Hoover Commission under the auspices of the Truman Administration.

With these initial observations, let me attempt a logical exposition of the major issues we perceive and our approaches to them. Most of these issues are inherent in management problems; some like the immediate budget pressures are particularly pressing at this time; and some we hope are transitional.

1. THE OVERALL BUDGET AND ITS FUNCTIONAL ALLOCATION

One of the hardest problems with which we have had to grapple is the rapid change in the public's attitudes and priorities. It is axiomatic that public policy and budget policy reflect the public's desires. At an earlier date, I suggested to the subcommittee that, with respect to the Defense budget, one of the knottiest analytical problems is how much of the nation's resources should be devoted to Defense. More broadly, it is equally difficult to answer analytically the question: How much of the nation's resources should be devoted to public purposes? Inevitably the decision must reflect a broad public consensus—subject to changes in priorities. It is no secret that the consensus is now undergoing change. Every indication, including Congressional actions, suggests a growing public weariness with continuing to bear the present tax burdens. Inevitably this implies a slower growth of revenue and increasingly hard choices with respect to the programmatic content of the Government's activities.

It is a truism, though one that bears continuous reiteration, that the Government cannot sustain a foreign policy stance, a force structure, and an array of domestic programs more ambitious than the public is willing to support—in terms of overall resources. Yet, program analysis has historically concentrated on particular program elements or, at best, broad agency responsibilities—with relatively little attention paid to sudden and painful changes in the macroeconomic constraints. More severe constraints may imply adjustments which from the standpoint of an individual program appear undesirable. A program stretchout, otherwise uneconomic, may be the most appropriate policy. A shrinkage of resources means an implicit jump in the discount rate, which may require the deferral of programs previously considered desirable.

These kinds of pressures will have to be taken into account by program evaluation offices throughout the Government. Budget-wise we are currently faced with a downward shift in the growth of revenue and with the most rapid increase of the so-called uncontrollables—outlays governed by statute, formula, or contract—in the nation's history. Consequently, the short-term growth of outlays for controllable programs must be minimal.

Discussion of priorities is therefore both desirable and necessary. To such discussion the PPB-type of analysis can contribute in a limited way—by delineating tradeoffs and alternatives. By itself, however, PPB provides no mechanism for the selection of goals. It is most relevant when objectives are stable.

To be useful, the reexamination of priorities must be serious and responsible. Unfortunately, much of the public discussion has been rather superficial, boiling down to: Finance a particular program by ignoring some competing demands. The large Defense budget has become an increasingly obvious target, and is envisaged by many as a veritable horn of plenty for financing a disproportionately large list of domestic program demands.

This Administration has worked to reduce defense outlays, but it will continue to do so in a responsible and prudent manner. The external menace to the United States and to its allies has not and will not disappear simply because some of our citizens have become weary of our international commitments or disenchanting with our military

establishment. At times in the past, the external threat may have been exaggerated, but in its true proportions it will not disappear, simply because we would now prefer to devote our energies to other activities. It cannot be eliminated, simply by ignoring it.

2. OBSOLESCENCE, SYMBOLISM, AND EVANGELISM

Motives similar to those that led President Johnson to introduce PPB on a government-wide basis in 1965 will influence any President. If there are to be new initiatives, programs responsive to the public's current needs, financial leeway must be obtained. At any time, but particularly when the budget constraint is tight, this implies a hard look at established programs which may be obsolescent, or redundant, or have low priority in relation to changing public attitudes and needs. Good program analysis is a prerequisite to rooting out these low priority programs. This function explains why PPB will never enjoy universal popularity among all agencies in the Government. Nonetheless, however painful, all agencies must be encouraged to use good analysis to justify not only their existing programs but their recommended new programs.

The role of PPB in evaluating proposed new initiatives deserves special emphasis. The nation is too resource-short to employ much in the way of resources simply for symbolic purposes. Nonetheless, there is an ancient political tradition to deal with problems on a symbolic level. Senator Keating once characterized this habit as the Washington reflex: ". . . You discover a problem, throw money at it, and hope that somehow it will go away." In the quest by agencies for funds it is an effective device to associate their programs, frequently quite irrelevant, with currently popular goals, frequently quite laudable, notwithstanding the fact that the proposed solution may not even make a dent in the problem. It is this source of budgetary expansion that makes the programming aspect of PPB so critical in the evaluation process. If a vast wastage of public funds is to be avoided, it is of primary importance that there be demonstrable programmatic linkage. Programming ties together specific inputs and specific outputs, and this function turns out to be more important than the precise measurement of benefits.

I might add that the combination of political symbolism and the evangelism of agencies and pressure groups is a very powerful one. I am sure that you are more aware of this than I. Many agencies have a set of ready-made solutions in search of a problem, and these will be attached to popular concerns in ways that are demonstrably superficial. It is the role of good analysis to resist such drives, but the pressures frequently become too powerful to restrain.

3. ALLOCATION AND OTHER OBJECTIVES

The primary concern of program evaluation is the efficient allocation of resources. This may be qualified to mean overall efficiency against a budget constraint rather than piecemeal efficiency, so that individual programs proceed at a less than optimal pace because of stabilization objectives. But one should avoid broadening "analysis" to include all "factors", such as income distribution, political realities, and the pres-

ervation of empires. In that event, the primary thrust of analysis is lost; it becomes very imprecise and not very useful.

Efficient resource allocation, however, also implies reallocation. To the parties concerned reallocation can be extremely painful. Even when manpower is transferrable, it means the loss of beloved hobby horses and white elephants and a shifting of status relationships. The existing entities may be counted on to be protective regarding their organizations, capabilities, manpower, and doctrines.

Program evaluation establishes a fairly rigorous set of standards. Those organizations whose programs pass these qualifying tests will regard analytical support as their due and feel no special gratitude. By contrast, those whose programs fail the tests will be angry and resentful. They will charge that the tests are irrelevant or capricious, and on occasion there may be some substance in the charge. Still, even when tests are perfectly designed and administered, somebody is bound to be disappointed. As a general rule, dissatisfied organizations make more noise than satisfied ones—and even the latter have additional aspirations. The result inevitably is a great deal of criticism of PPB *when it is performing its function*. The price of greater efficiency is painful readjustment. Inevitably efficiency decisions will be tempered by a notion of what is politically or organizationally feasible. Such decisions, however, are not the primary mission of PPB.

The fact that an activity is indefensible in analytical terms does not mean that it will lack for defenders. Any program, by the fact of its existence, acquires beneficiaries. For most programs, there will also be a constituency group, external to the bureaucracy, whose support may make abolition or retrenchment even more difficult. Within the political framework, the decision-makers must take these factors into account.

4. POLITICAL DECISION AND PPBS

Because the calculus of politics and the calculus of efficient resource allocation differ so markedly, the combination of cost-benefit analysis and politics can turn out to be quite ironical, as well as explosive. It may be recalled that cost-benefit analysis was originally and most thoroughly applied to water resource projects. Yet, it is a matter of common knowledge that direct benefit/cost ratios of .5 or .8 have not precluded projects from being pushed and implemented. One might suggest that the more effective the analytical results in establishing a presumption not to proceed with projects having unsatisfactory benefit/cost ratios, the greater is the pressure to adjust the analysis.

In politically sensitive areas, it might be suggested that successful analysis carries with it the seeds of its own corruption. The pressure builds up to alter the rules of the game and to bolster the benefit side with all sorts of supplementary benefits, frequently quite implausible, in order to get on with the project. However, even in these cases, one might argue that analytical techniques have achieved some measure of success. Analysis improves the quality of the debate; it forces proponents of projects to argue in analytical terms; and thereby substitutes calculation for evangelism.

Still the moral is clear. Political decision must incorporate a broader range of factors than "mere" efficiency calculations. It must take into account distributional effects, beneficiary desires, and the attitudes

of the affected parties, even if some might regard these attitudes as parochial.

In recent years efficiency-minded observers have advocated zero-base budgeting.* For many analysts it has become a preoccupation as well as an occupational disease. As one charged with some responsibility for resource allocation, I confess a certain partiality for the concept. It is a policy Holy Grail worth pursuing. Nonetheless, for reasons that should be abundantly clear, I do not think that we will come very close to it, appropriate as it may be as a standard. There are too many affected groups whose expectations would be violently disrupted by zero-base budgeting. One cannot do everything at once.

Political leaders are keenly aware that in formulating policy you must start from where you are. They also recognize the countless constraints imposed by and variables involved in working within the system. These considerations are not always evident to the professional observer who enters into the system—in a sense from the outside—with a coherent set of objectives, and who proceeds to develop a rational program for achieving those objectives, while ignoring all those political considerations that he regards as irrelevant or adventitious. These include local interests, personalities, habits, prejudgments, rivalries, and the like. He is likely to wonder why the society fails to get on as rapidly as he thinks it should towards achieving his very reasonable goals. But he has left out all of the elements which are involved in creating a political consensus and which so regularly constrain political decision.

In this sense these professional observers, these analysts, or these outsiders are like men from Mars. They observe the system from the outside—and they prescribe more rational patterns of activity. Even when they are right, the society will be quite slow in accomplishing the changes they suggest. Yet, we very much need this single-minded and detached objectivity to help us along the trail.

5. PPB WITHIN THE BUREAUCRATIC STRUCTURE

What has been said regarding the relative detachment of such analysis from the system in which it operates leads into one of our most intractable problems: that is, effectively tying PPB into administrative procedures and the decision-making process. This goal has to a considerable extent been achieved within the Department of Defense, but less well in most other agencies. I consider these bureaucratic realities to represent the most important unsolved problem in increasing the effectiveness of resource utilization by the Government. In principle, everyone is for analysis; in practice, there is no certainty that it will be incorporated in the real-world decision process. It is therefore more important to concentrate on this issue than to proceed with a further articulation of analytical techniques.

As we all recognize, there is a tempo reflected in the decision process. Many go-ahead decisions result from the seizure by the proponents of some program of the opportune moment to present their case. There are numerous stratagems that an agency may employ to enhance the

*See p. 493 for Dr. Schlesinger's further discussion of zero-base budgeting.

prospects for approval, regardless of their regularity from the standpoint of accepted procedures. The best stratagem is to create at least the illusion of time pressure, so that proposals will not be subjected to searching scrutiny. Periods of transition are uniquely suited to the trotting out of old proposals, most of them previously rejected for good reason, on the expectation that they may catch somebody's fancy. In the longer run, such stratagems become less effective, and proposals move in a more orderly fashion through established channels.

For program analysis to be effectively employed, there must be a hunger on the part of decision-makers to have their intuitions sharpened through analysis. Analysis must bite into the decision-making process in such a manner that program proponents recognize that their chances for success are substantially reduced if they have not done their homework. It is important to recognize that unless there are organizational incentives to do good analysis, that it cannot flourish. Government agencies must be persuaded that new programs must be undergirded by good analysis before acceptance, and that old programs will gradually be reduced unless they can be demonstrated to serve some public function. Unless the agencies recognize these incentives and respond to them in a positive manner, PPB serves more and more in a policing role.

It is an objective of this Administration to *institutionalize* PPB within the departments, so that they automatically perform more and more of the task. When there is an explicit, disciplined, analytically-supported, decision process in an agency, which has been institutionalized, much of the work of the Executive Office will have been done in advance. To facilitate the process, the overall performance of each agency can and should be evaluated, so that greater or lesser confidence may be placed in its analytical and judgmental capabilities.

Much of the Bureau's effort regarding analysis in the past years has been one of proselytizing. Mr. Chairman, I am sure you are aware of this. It is our judgment that analysis has now gained sufficient acceptance that this proselytizing function can be reduced in scope. We need fewer statements about what analysis can do, and more demonstrations throughout the bureaucratic structure of what analysis has accomplished.

The Bureau will continue to monitor the programmatic content embodied in agency budgets in order to assure that programs are in line with Presidential priorities and make effective use of resources. This involvement in programmatic content has occasionally led to the charge of Bureau intervention in internal agency management. This is certainly not our function. I might point out that, on the principle that those who cry the loudest are frequently least hurt, the strength of the charges is typically inversely proportional to Bureau involvement. It is an essential ingredient of the Bureau's function to examine programmatic content. The better the agency's performance, however, the easier is our task.

We are optimistic that the agencies will pick up more and more of the load. We believe that we have reached the turning point, so that there is less need for proselytizing and more opportunity to do studies in depth of cross-agency problems. We are striving to foster an incentive structure that results in the effective institutionalization of PPB techniques close to the heart of agency decision processes, rather

than having PPB as a surface attachment to satisfy Bureau requirements.

Mr. Chairman, I think you have been aware of this problem too, as has been your staff.

Senator JACKSON. You are making an excellent statement.

Dr. SCHLESINGER. Let me close by mentioning some actions needed to complement PPB.

6. ACTIONS NEEDED TO COMPLEMENT PPB

To date, PPB has fallen short of its potential for a number of reasons. A major handicap has been the limited scope for analysis in relation to narrowly defined agency function. To a large extent, the agency structure of the Government reflects historical accretion. A very large number of agencies were designed to concentrate on inputs rather than outputs—and respond to particular technologies or particular clientele groups. This is perhaps most notable in the natural resource arena.

In many cases, we need to take a broader view of public objectives than is represented by specific agency responsibilities. PPB in an input-oriented agency may do useful things: it may save some money or it may increase effectiveness marginally. But for analysis to achieve its full potential, it must concentrate on broader public objectives. In many cases, to survey an array of inputs so that they may be most effectively combined to serve public purposes requires structural reform of the bureaucracy. It is notable that President Nixon's stated goal of achieving more effective management of the Executive Branch dovetails neatly with the objective of making analysis itself more effective. Analysis should contribute to more effective management, but in itself it is dependent upon achieving a better management structure.

Another deficiency which has characterized some analytical work and much of the proselytizing in its behalf is the belief that PPB represents a kit of tools that can be employed by an "expert" with little substantive knowledge of the area under review. PPB is then viewed as a kind of sausage grinding machine in which the practitioner grinds out packaged results simply by employing his tools and without that deep and time-consuming involvement which provides an understanding of the substance and structure of the function under examination. Such a view is erroneous, at best, and potentially pernicious. Unless the analyst is thoroughly saturated in the substantive detail of his program, analytical results are likely to be superficial or worse. For this reason analytical staffs must not only be trained, but sufficiently large to permit deep familiarity with substantive programs.

A similar observation may be made with regard to executive management, taken in isolation. Understanding of management techniques is desirable in itself, but appropriate management structures will vary in accordance with individual programs. Thus, design of a management system should reflect adequate knowledge of the substantive content of the function for which the structure is being designed.

Like program analysis, management science performs inadequately, if it is thought of in simplistic terms. The upshot is that these several elements are mutually dependent. PPBS appropriately goes hand in

hand with modernization of the bureaucratic structure, with efficient management techniques, with understanding of the substantive content of the various governmental functions. This Administration is dedicated to the efficient and simultaneous employment of all these instruments.

ROLE OF ANALYSIS

Senator JACKSON. Dr. Schlesinger, I want to compliment you on a very fine statement. You have certainly brought a lot of realism to this on-going discussion of the role of PPBS.

I re-read your excellent memorandum on the "Uses and Abuses of Analysis." Let me begin by asking you in what ways, if any, you might want to revise it in light of your experience so far this year?

Dr. SCHLESINGER. A number of people, Mr. Chairman, have asked me that.

You will recall I said in there something with respect to two and a half cheers for systems analysis rather than the conventional three cheers. I have been revising that upward, Mr. Chairman, and am asymptotically approaching three cheers.

WHAT MAKES A GOOD ANALYST?

Senator JACKSON. You say in your statement: "Another deficiency which has characterized some analytical work and much of the proselytizing in its behalf is the belief that PPB represents a kit of tools that can be employed by an 'expert' with little substantive knowledge of the area under review."

I think you really have gone to the heart of the problem here because without a doubt it is in this area where, in the past, we have witnessed so much of the abuse of this whole concept.

This leads me to the question, and it is a difficult one, I know: Are you finding it possible to locate and identify people who are good at analyses but who also have the substantive background in the area that they are probing?

Dr. SCHLESINGER. I think, Mr. Chairman, that there should be a gradual increase in the number of trained people, and that we should be careful to make sure that the training of technical personnel in this area be completed before their analytical recommendations become a major input into policy-making.

The number of people does vary by function. For example, in the water resources area we have large numbers of trained people. In the defense area, as you will recall, because of the large investment by the Department of Defense in the period since 1945, there are many people who have been trained.

I might point out that I am not referring simply to the civilians, or so-called defense intellectuals here. There is a long and honorable tradition of analysis within the Services, themselves. In some other areas, human resources programs, we are making progress. However, these programs have expanded so rapidly in recent years that there has frequently been more enthusiasm than analysis—both in the construction and in the subsequent evaluation of the programs.

Senator JACKSON. Have you set any standards for the departments and agencies in this regard? Has any directive or memorandum been issued on this?

Dr. SCHLESINGER. As I mentioned before, we have Bulletin 68-9, which was a follow-up to the memorandum that you mentioned, which was released in 1965. Bulletin 68-9 was signed by Mr. Zwick. It is now undergoing revision by Mr. Mayo. That is in force.

In addition, there has recently been amplification by the Bureau of the Budget in Circular 94, which describes analytical techniques.

But we have not laid on the agencies specific requirements with regard to training. That is an interesting proposal, Mr. Chairman.

Senator JACKSON. I wish you would take a look at that. It seems to me that one might explore the idea of trying to train more career substantive people in these techniques, rather than the other way around. Experts in analytical techniques may not have a grasp of the substantive issues, whereas a lot of our fine career types have a thorough background in substantive matters. Possibly they could have an opportunity to upgrade their educational talents to add this discipline to that background.

Dr. SCHLESINGER. That is a good suggestion, Mr. Chairman.

We will encourage the agencies to follow your proposal. As you know, after the Bureau established the PPB on a government-wide basis in 1965, there were developed a number of programs in which career personnel from the agencies were sent to universities for training in these techniques. So, something of that sort has been done, but perhaps we should be doing more of it.

Senator JACKSON. Is there any particular place that you would recommend that we might send these people for such training, in addition to RAND?

Dr. SCHLESINGER. I think we need to do a little evaluation of the programs that have been going forward in the universities. I forget the precise number involved in this program. Some of them undoubtedly have performed better than others. I should perhaps withhold judgment, even with respect to the institution that you mentioned.

ARE WE BECOMING OVER-COUNCELED?

Senator JACKSON. I will ask one more question now and then turn to my colleagues.

I have noticed with some interest, and maybe a little apprehension, what might be called a "Council-manic tendency" in the Government in recent months, with the creation, in addition to the National Security Council, of the Urban Affairs Council, the Rural Affairs Council and the Environmental Quality Council. I may be overlooking some others at the Cabinet level.

I wonder how the Bureau of the Budget views this development. As you know, Governor Harriman once recommended that the Government engage in occasional committee-killing undertakings. Do you think we are getting over-counciled?

Dr. SCHLESINGER. I think that is always a danger, Mr. Chairman. That depends, in part, on the quality of the staffs of the councils. As you know, the staff of the National Security Council has been built up substantially. In the domestic areas, the process of staff construction is still going on, so that we are not in a position to evaluate how well they might be organized to handle these cross-agency responsibilities.

You are dealing here, Mr. Chairman, with one of those unsolved problems of management: How to deal with cross-agency responsibilities. Whatever technique one comes upon has deficiencies. Given the fact that we have, for example, in the environmental area, a number of responsibilities which are flung across a number of Government departments and agencies, there should be some mechanism to bring these responsibilities together. The environmental area, I know, is one that has particularly concerned you.

We must avoid having the councils become the lowest common denominator or, even worse, an opportunity for mutual back-scratching. In that event we would fail to get at those proposals or those programs that fall between area responsibilities.

One of the purposes of these councils is to find out about those programs. If a committee-type arrangement becomes a back-scratching exercise then you are not getting out of the committee what you should.

I think President Nixon, himself, is keenly aware of this, and wants the councils to perform so as to cover the gaps rather than to re-enforce those areas in which we are already over-covered.

Senator JACKSON. Senator Gurney.

PERFORMANCE EVALUATION

Senator GURNEY. I agree with the Chairman. This is a most excellent statement. I would also say it is most refreshing to see a man in your area, Dr. Schlesinger—budget-making and systems analysis—with the awareness of the political realities of life which you have obviously shown in your statement. I am not talking about partisan politics, but rather the politics of people.

Dr. SCHLESINGER. Senator, whatever my awareness before coming to Washington, it has grown.

Senator GURNEY. It is amazing to me that those in the Executive Branch that are charged with the business of politics are so unaware, really, of what happens on the Hill. So, this is refreshing.

I would like to take a specific example. I had a Regional Director of Adult Education in the office about three or four weeks ago. He was new to this job, though he has been in education all his life. We were chatting about his problems, and he was saying, "I wish there was some way to evaluate whether this program is doing any good or not."

His complaint was that the way the show was being run—and he was in charge of it—there really wasn't any way to tell whether this program was really benefiting at all. There was no way of checking it out.

How would your PPB approach handle this?

Dr. SCHLESINGER. One of the problems, I think, Senator, is that within an agency the proponents of individual programs or pieces of programs, never look across at the other programs. The agency itself, sometimes for reasons of internal peace, fails to make these program comparisons within the agency.

In the education area, for example, we have had a proliferation of programs, many of them financed by the Federal Government on a grant-in-aid basis. I think we want to look across these programs, see

which of them are most effective, and build those up, consolidate other programs where possible, and, finally, for those programs which just haven't been very productive to try to eliminate them.

The problem is that analysis works least well, and can bite into the decision-making process least well, where there are strong emotions involved. Education is an area which arouses the strongest emotions. When you affect people's children, how those children are being influenced—so that they may diverge substantially from the pattern the parents approve—you are getting into an area where it is very hard for analytical techniques to have great influence on the program.

In areas in which there are fewer emotions involved, analysis can be more effective.

Senator GURNEY. That Regional Director of Adult Education had an idea that might work, and I just mention it for what it may be worth. He said, "It seems to me if you tied in adult education in some way with social security, and found out who stayed on welfare and who dropped off welfare, whose welfare was cut down and so on, there might be some way of determining whether the input into this particular adult education program is amounting to anything."

His point was, really, that he couldn't see how to tell whether this program was doing any good or not, in the way of improving somebody's economic status, which, of course, is the point of the education program for adults.

I would hope that your PPB idea would be able to contribute to handling that sort of problem.

Dr. SCHLESINGER. That is one of our goals, to do more with program cross-cuts.

One of the problems, of course, is that each component of the bureaucracy has as one measure of its success the putting out of funds. It is only the more reflective individuals in an agency who will worry about responsibilities that go beyond those of the particular program with which they deal.

Incidentally, we have been doing some of this work in the Bureau, trying to tie together results in some of the human resources areas, the amounts of money being put out and the level of success achieved after people leave the programs rather than the apparent success during the time that they are in the programs. It is what happens to the people later on that is important, rather than while they are participating in the programs.

Senator GURNEY. That would make some sense.

By the way, how do you go about getting the message across to an agency?

Let's take HEW. Suppose you analyzed one of their programs and found out that there really wasn't any evidence that it was doing any good. Then what do you do?

Dr. SCHLESINGER. There are a number of techniques that can be used.

Senator GURNEY. I am not aiming at HEW. One could take the Defense Department or any of the others. I am using HEW as an example.

Dr. SCHLESINGER. One technique is the so-called major program issue process before the budget begins to be prepared. The Bureau staff, in association with agency staff, specify a number of issues that should

be taken up in the course of preparation of the budget. If sufficiently large and important, it becomes one of the major program issues.

For the major program issues, the agency prepares an analytical study well in advance of the budget submission. The study is then reviewed by the Bureau. An effort is made to resolve or at least define the major issues, so that they can be decided in an intelligent way before or during the budget season. For smaller issues, the Bureau staff and the agency staff take a careful look at what is in the program so that some judgment can be made about it.

In the case of either a major or a smaller issue, if the agency fails to make a sufficiently convincing case, the Director's recommendation to the President may exclude or reduce funds for the program, or hold funds constant until the agency has demonstrated that the public is getting an adequate return for the money invested.

Senator GURNEY. I will now yield to Senator Stevens.

Senator JACKSON. Senator Stevens.

SILLOVER EFFECTS AND TOTAL PROGRAM OBJECTIVES

Senator STEVENS. I share the Chairman's feeling about the able presentation this morning, but I have some practical problems with the PPB approach.

Let me start out by saying I was downtown for four years, as the Chairman knows, in the Department of Interior. It seems to me the system has changed a great deal. It has not changed, in my opinion, for the best. Let me give you an example and ask a question about it.

We have recently had an across-the-board military cut. My State of Alaska has a tremendous military installation which has a dual role, as far as I am concerned, a defense role and a training role. I found that one of the analysts from the Bureau of the Budget went up and took a two-day trip around our State. So far as I know, it was the only time he had ever been there. Maybe he had been there before, but I don't know that.

He made a decision as to what was going to close. I am saying this because of what the Chairman said in terms of trying to have the analyst blended with the career people who know the program. I will bet he doesn't even know that, as a consequence of his decision, he closed one of the key radar posts in Alaska. This sort of thing is just sheer stupidity.

All I am saying is that when you get this PPB system working, it should work best at the higher career levels in the departments, and not in the Bureau of the Budget.

The responsible military officers up my way are scared to death when your Budget people come up. They really are. And I think justly so, because they have seen the results. The Budget officers carry a great deal more weight than the Defense brass that comes in. When the Bureau of the Budget guy comes in, they know something is going to happen.

I think you should try, to the extent possible, to get this analysis done in depth in the Departments, and then you can review it.

My question is: We had what we called a technical review staff in the Interior Department. We created a staff of experts who reviewed all the programs and reported to the Department.

Have you done anything about that in terms of letting some career people within the Department make this analysis, and having your people, a small, elite staff, review it? My impression is your staff has grown like all get-out since I left Washington.

Dr. SCHLESINGER. Senator, our staff is now smaller than it was in 1949, I believe.

Senator STEVENS. That is amazing, if that is so.

Senator JACKSON. I think you may have in mind, Senator, the larger systems analysis staffs in some of the departments, for example in the Defense Department.

Senator STEVENS. My point is that there are critical objectives and programs that are missed entirely when this PPB approach is applied by someone who is strictly a program analyst, who does not have a basic substantive understanding of the issues.

We had an across-the-board allocation of Defense cuts, without really full consideration of the impact of the cuts on the mission of the military in Florida vis-à-vis Cuba, and of the impact of the cuts on the role of the military in Alaska with respect to Russia, given the special proximity to Russia and also given the special opportunities for training in that area and their relation to the total U.S. defense role.

I think there is something lacking here in this approach as far as taking into account the total program objectives.

Dr. SCHLESINGER. Let me try to respond to your question.

In the first place, I agree wholeheartedly with you that we should do our best to encourage the Departments to do this kind of work. We will continue to encourage this kind of responsiveness.

The Bureau does not usually specify particular reductions for the Department of Defense, such as the shutdown of a particular installation. Rather the Bureau may make suggestions to the Secretary of Defense which he can consider in accomplishing the financial reductions to be made. The decision is left to the Department. There may, of course, be occasions when the Bureau differs strongly with DoD's judgment. Resolution of those differences would then be made by the President.

In the most recent wave of cuts, the Department of Defense administered those cuts by itself. The relationship between the Bureau and the Department of Defense is somewhat unique at the examining level. The Bureau of the Budget examiners participate in the so-called joint review over at the Department of Defense. The joint review starts on October 1st and runs through early December. During the rest of the year, they are in touch with their Defense counterparts.

Bureau staff works with OSD personnel in reviewing the requests of the Services.

I don't know to what extent the incidents that you refer to might be a result of this joint review. If so, then that is a product in which examiners, in collaboration with OSD staff, present recommendations to the Secretary of Defense, on which the Secretary proceeds to act. Regarding these particular items, flattering as it may be, we would not demand or accept unilateral credit, or blame.

Senator STEVENS. To what extent do program objectives come into the PPB system?

The objective of having the Air Force in Alaska, I take it, is a total defense concept, which involves training plus defense against the threat that is there.

To what extent does that have any bearing upon an analysis of the program from the point of view of the impact of overall reductions in a situation like we are in today?

Dr. SCHLESINGER. Unless the overall objectives are taken into account, PPB is not doing its job. As a matter of principle, and I am not suggesting that this is always the case in practice, one must analyze, one must search for the overriding program objectives. One just doesn't reduce resources without considering the potential impact of that reduction on the program's overriding objectives.

Senator STEVENS. I am not on the Armed Services Committee, but my impression of the problems that Light Intratheater transports run into lead me to the conclusion that Orville and Wilbur would have folded up their tent and left for North Carolina had they had to go through PPB to justify getting the money to go ahead with that experiment.

We have apparently lost the modernization concept of Light Intratheater transport in the current period of military reduction. I don't understand how something like that can fall by the wayside if this type of analysis is of high quality. I understand it was on the basis of a program analysis that the concept of the Light Intratheater transport was dropped.

Incidentally, it has a capability to fly and hover so that if you had that capability for search and rescue off Alaska, you wouldn't have to radio for the long-range jet helicopters to come out when the long-range patrols find some people in trouble. They could switch and hover and pick them up. It has a tremendous capability for the future as far as search and rescue is concerned.

Senator JACKSON. Senator Stevens, I think you are raising a point here that undoubtedly ought to more seriously involve the Executive Branch of the Government in consideration of the special problems in Alaska in relation to a military decision to cut back military facilities. There are two special situations. There are peculiar psychological problems because of the close proximity to the Soviet Union. There is the special situation in that vast territory that depends upon the military for the unique problems that arise in connection with search and rescue and in maintaining a viable government.

Right or wrong, the new State and, prior to that, the territory, operated on certain assumptions that have come to be a definite factor in the governmental affairs in the State. What you are asking for is that when a decision relates to a cutback of defense facilities, there should be a broader review to take into consideration the impact of that decision on matters that are not necessarily of a narrow military nature, but involve the other considerations that I have alluded to.

Senator STEVENS. I am saying, really, in effect, how do the total program objectives get into PPBS? I don't see how they can or how they have.

Senator JACKSON. I think you are right that they should be a factor in the decision-making process on closing out some of these remote facilities operated by the Defense Department and others not so remote but which play an important part in remote areas.

Senator STEVENS. When you get into this military reduction period, how does the difference between a base in Florida—where there is a real threat—and a base in North Dakota, enter into your overall program review?

I think we have missed some type of judgment factor that can only come from the people directly involved in the substantive programs. It cannot come from the Bureau of the Budget type of analysis. How does that judgment come in?

Suppose the responsible General up in Alaska, or the General from Senator Gurney's State would say, "We need an extra wing here because of the program that we have, which is entirely distinct from the programs anywhere else in the country."

How does he get that point across in PPBS, in the program budget review concept?

Dr. SCHLESINGER. Well, within the Department of Defense, there is an established procedure in which the command makes a request of a Service or the JCS. If it is a special Defense agency, it may make a direct request to the Secretary's Office. If it is a service command, it makes the request through the Service. If the Service wishes to, it can present this case in a so-called program change request. In that PCR the Service will provide the analysis which backs it up.

That part of the procedure, I think, is fairly clear-cut and is probably as even-handed as it can be made.

You ask a question, though, that goes beyond that: To what extent can objectives which are not the primary function of the agency be taken into account, objectives that have a spill-over in the communities affected? In that case, that is a very difficult problem that we both recognize. I am not sure that we have the answer.

Senator STEVENS. Maybe that is the role for a modicum of political interference.

Senator GURNEY. A very good example of what Senator Stevens is talking about, as far as Florida is concerned, was the cutback in radar surveillance, which I suppose affected many areas. It was cut back in Florida, too. Just about that time, a Cuban MIG came and landed in south Florida, if you will recall, undetected by the surveillance. So, we got some further surveillance restored from the cut.

Senator JACKSON. Mr. Perle, you may proceed with the questioning.

INCENTIVES FOR HIGH QUALITY ANALYSIS

Mr. PERLE. I was interested in the brief remarks you made about establishing incentive structures for the systematic use of high quality analysis.

Are there programs now under way to promote this objective? If there are not, what do you think might be done?

Dr. SCHLESINGER. As I indicated, unless the analysis bites into the decision-making process at some point, it will either be an activity that is carried on but is irrelevant, or it will, because it is irrelevant, slowly wither away.

It is therefore necessary to convey to the Departments that, unless there is strong analytical support for new programs, those programs will not move forward. To achieve that goal, we will need the support

of the President—to insist that programs be well staffed out before they are given approval.

That is the primary incentive: if there is no pay-off without analysis, then, by golly, everyone will do analysis.

The other actions that may be taken will be subsidiary, working with agency staffs on the program issues. The agency staffs have to be able to get the attention of their bosses.

Hopefully the bosses will be hungry to have their own intuitions sharpened through analysis. Failing that, however, because the head of the agency becomes persuaded that, unless he permits fruitful analysis, his programs won't get past the Bureau or Presidential review.

THE CORRUPTION OF QUANTITATIVE TECHNIQUES

Mr. PERLE. In your memorandum to the subcommittee last year on "Uses and Abuses of Analysis", you wrote, "The process [of analysis] can be (and has been) . . . corrupted, when questionable (phony) numbers are introduced."

I wonder if you feel this has been one of the problems in connection with our policy determinations on Vietnam?

Dr. SCHLESINGER. That is not an easy question to answer; in fact it's somewhat loaded. But it's a good question, and I will take a crack at it.

I think that there is little doubt that there has been a misapplication of quantitative techniques, associated with the emphasis upon quantification as opposed to broader evaluation. There was stress on things like body count. Those tendencies created incentive systems all of their own. There is a difference between quantification, according to old-style rules of thumb, and analysis. The problem was that the quantification became all, and the analysis became almost trivial.

Such questions as kill ratios are of lesser importance in this kind of context, than how much the opponent can stand. There was fairly limited analysis of what the opponent could stand, and too much satisfaction taken in kill ratios, a very poor measure.

The phony numbers? To the extent that they existed, I think they existed because they got built into the incentive system. Command relationships, promotions, that sort of thing, became dependent upon these formulas for quantification. Under those circumstances, it was inevitable that you began to acquire a good deal of false data.

Of course, as we know, false data are presented in any war. If we go back to the Second World War, it seems to me the total claimed casualties against the German Army must have been upwards of 15 million. The difference here is that because of the supposed relation to analysis, the numbers acquired a certain sanctity which was quite inappropriate.

In addition to the phony number, there is the problem of the misleading number. It is, perhaps, even more mischievous because a misleading number is one that you are likely to take seriously.

I might mention hamlet security for example. One of the criteria used in measuring security is whether the village chief sleeps in the village at night. To the extent that the village chief does sleep in the village, this has been taken as an indicator of pacification. There is no reason to believe that that is the appropriate inference.

It may well be, and frequently is the case, that the fact that the village chief sleeps in the village is simply due to his working out an accommodation with the VC. In many cases sleeping in the village at night simply reflects the fact that the VC is in control of the area. In that event it is the opposite of pacification.

So you may have these misleading indicators which are more of a problem than the phony numbers, themselves. I think that most people did apply some rate of discount to claims involving body count.

Mr. PERLE. Do you think our understanding of these sorts of phenomena is much better now than it was a few years ago, and, therefore, our ability to interpret these figures and use them effectively analytically has much improved?

Does more work need to be done in this area?

Dr. SCHLESINGER. Certainly, much more work needs to be done in this area. We understand the process of what went on in Vietnam better now than we did while it was happening. But that merely means that in hindsight we can see some of the errors in judgment that occurred. It does not necessarily mean that we would be better able to perform in a similar situation, or to advise another nation to perform in such a situation, better than we did after 1965. I think we would be less complacent about how much we were accomplishing.

Mr. PERLE. I ask because it seems that much of the knowledge that might have been helpful in our interpretation of events in Vietnam would fall roughly under the heading of social science research. Yet, there seems to be a tendency to cut back on social science research precisely when and where it may be very useful, particularly in the Defense Department.

Dr. SCHLESINGER. I agree. Social science research is the toughest of all to do well because it is so elusive.

Let me qualify that by saying that social science research, itself, is not immune to deliberate manipulation, and, frequently, beyond the question of manipulation, the so-called research is just quite irrelevant to the problem.

It becomes a matter of one observer writing very bad papers to another complaining about the way the world is going. That isn't very helpful.

But I agree with you that the better understanding of these social and psychological factors early on would have been critical in appraisal of a guerrilla war. We were applying rules of thumb, methods of operation, capabilities that were essentially designed for a set piece battle, most typically contemplated in Western Europe.

One of the most significant problems is the pressure for numbers. What happened in Vietnam is that we were simply drowned in statistics; we were drowned in information. A very small proportion of this information was adequately analyzed. We would have been much better off to have a much smaller take of information and to have done a better job of interpreting what that information meant. But the system that was developed in Vietnam was geared to the massive outpouring of data, data that drowned all of us, I think.

AGENCY USE OF ANALYSIS

Mr. PERLE. I think we are all interested in the successful use of analysis in those areas where it is appropriate and where it can assist in the

efficient allocation of resources. What government agencies do you think might effectively use analysis, to what extent are these agencies now attempting to do so, and with what early results?

Dr. SCHLESINGER. As a general rule those agencies that have the most powerful incentives to use analysis will be the ones to employ it. Typically, these will be either new agencies or agencies that are moving in new directions. The agencies that monitor old programs, which on careful review may not be worth the money, are the ones that will do their best to fend off analysis and to criticize PPB.

HEW has been working energetically in the direction of improved analysis. Yet the results are mixed. But the energies have been thrown in.

DOT has shown considerable ingenuity, and the analytical performance at DOT has been quite impressive.

The AEC has done some excellent work. The AEC is a well-managed agency.

In this connection I might mention the AEC's cost-benefit analysis for the breeder reactor program, which is one of the better jobs that has been done. The Commission, I think, strongly supported its position that a breeder program was worth the investment of national resources. What the analysis lacked and, indeed, could not include was a basis for determining the balance between the Government's responsibility in developing the LMFBR, and the private sector's responsibility. That is a political judgment. That is one of the things that analysis can't deal with definitively.

But they did the job that they turned to very effectively, whether national resources should be invested in breeder reactors. I believe there was more skepticism about the breeder reactor program before the Commission did the study than after it was completed. This is one of those cases in which, from the standpoint of the agency, there was a pay-off.

There are a number of similar cases in DOT and in HEW.

WHO ANALYZES THE ANALYSES?

Dr. TURTS. I would like to pursue a point that Mr. Perle touched upon. Let me do it by referring to an area remote from this subcommittee's concerns, but one in which I think you and I, at least, have done a little work along the line, namely, the issue of monetary policy.

I suppose there is no subject on which we have better data, better numbers. Yet, as we all know—

Dr. SCHLESINGER. We are still arguing what the precise size of the money stock is.

Dr. TURTS. Yes; that is true. Yet, I think you and I would agree that we have better numbers in this area than we do in most of those that you and I are concerned about, national security, foreign aid, subjects of that sort. Yet, as we know, that doesn't stop the argument.

My question, then, is this: Somebody has to judge the analysis. To a certain degree, at any rate, I think this is the role of the Bureau of the Budget, to judge the analyses that come up from the agencies in support of the programs.

Dr. SCHLESINGER. Right.

Dr. TURTS. How well is the Bureau staffed to provide the kind of judgment of the analysis that is necessary? What I have in mind, to be quite frank about it, is that to some extent the nature of the analysis structures the judgment of the analysis.

You have economists judging the work of economists. You are an economist, I take it, and so am I. Isn't there a need for another point of view?

Is the Bureau really staffed appropriately to provide that kind of review of the analysis submitted by the agency? Is it in a position to ask the right kind of questions?

Dr. SCHLESINGER. I hope we are. In most cases, examiners are very much aware of agency problems or of local problems.

Also, we try to avoid making technical judgments. To the extent that we are driven to make technical judgments, we seek advice from qualified technical personnel, either outsiders or people within the agencies on many occasions.

On broad social judgments, admittedly that is a hard one. What we normally will do will be to indicate the several viewpoints in making the recommendations higher up. When the budget goes to the President, the President is made aware of the feelings of this group of citizens, or of this group within the agency, about some of the social implications of the programmatic decisions.

I would add something that Charlie Hitch mentioned to me about seven or eight years ago. I was indicating some mild reservations about quantitative analysis, that it could be pushed too far, that one might ignore other factors which were important but which couldn't be quantified. He observed to me at that time, "Don't worry about that, Jim. There will always be enough people, more than enough people, around to draw attention to those sorts of issues."

I think that probably is true. One doesn't have to worry too much about the failure of the affected parties to raise these kinds of issues. Whether, in the final decision, they are given adequate weight is a question for anybody's judgment. Because they are judgmental matters, nobody can say with certainty that they were given inadequate weight or too much weight. Overall I am inclined toward the Hitch view.

Dr. TURTS. Referring back to an earlier question asked by Senator Jackson, do you see a role in this area that we are talking about for the councils that are being established—not only the National Security Council in the area of national security questions, but the Urban Affairs Council in urban affairs, and so on?

Dr. SCHLESINGER. I think that is a principal function of the council. It makes certain that the views of affected parties will be represented before the President, before he makes a decision.

I think what was said earlier is a matter for concern, to wit, whether those items that do not affect parties within the existing governmental structure will be adequately brought to the attention of the President. For any problem that falls within the purview of the Government an existing agency may be assured, I think, through the council form, that matters bearing on that problem will be brought to the President's attention. That is one of the positive aspects.

Dr. TURTS. I suppose it would depend a good deal upon the kind of staff the councils have acquired.

In the case of the National Security Council a rather elaborate staff organization has grown up, which I suppose intends, among other things, to spot such gaps, to spot the areas for which no one is really responsible.

Are the new councils similarly equipped with staffs that will have such a responsibility?

Dr. SCHLESINGER. We are certainly moving in that direction. How large the staffs ultimately will be remains an open question. Of course, the White House has typically drawn on Bureau of the Budget staff for a considerable part of its staffing needs.

Dr. TURTS. One of the things that troubles me some about that is that the Bureau of the Budget's work is necessarily and properly, mainly the production of budgets. Inevitably, therefore, things have to be prepared with the goal clearly in mind—namely, to prepare the budget. I think this tends to staffing the Bureau by economists and other similarly trained people.

I think you would agree, and I know I feel, that we have had a much better view of the requirements of the economy, thanks to the creation of the Council of Economic Advisers and the development of its staff. It seems to me the sophistication with which we approach economic problems is really very much greater than it was beforehand, for example, in 1946, and that is largely because the council in this case has had a staff which has had within its purview anything that was of importance to the state of the economy.

In this case, of course, it is largely economists who are involved. In the case of environmental matters and urban matters, it seems that a good many more people than economists would be useful and needed for spotting the programs that weren't paying off, or identifying areas where possibly new programs might pay off.

Dr. SCHLESINGER. Let me make a few comments along those lines.

First, the Bureau draws on all sorts of disciplines to provide its own staff. We have a substantial number of engineers, political scientists, and the like. The typical complaint I have heard is that there are too few economists in the Bureau. I can assure you that, in many cases, a program will have a program advocate within the Bureau of the Budget. That is not always a source of reassurance. Occasionally, it is a cause for some disquiet.

In numerous cases, Bureau staff will fight for increases for a program.

I would not accept the characterization of the Bureau's function as intended to bring about program reductions. That would depend upon the broad economic outlook.

One former Director of the Bureau, to the chagrin of some people in the Bureau, stated rather boldly: "Stop trying to cut expenditures." That was during an Administration some time back.

But I think that our objective here is to tailor total expenditures to the available resources, the available resources coming from the President's policy with regard to taxation. We are not trying to cut programs. Our objective is to see to it that workable and merit-worthy programs have sufficient resources, that the missions ascribed to the agency can be carried out in fact and not to have mere tokenism.

Dr. TURRS. I have just one more question.

Making a very large assumption that the PPB system within the Executive Branch develops to the point at which everyone would be pretty satisfied that it is doing the job that was hoped for—this is a large assumption, but let's make it for a moment—and that the analyses that are coming up are persuasive to the President and his principal advisers, and the PPB approach is playing the role that it conceivably could play in affecting your decisions, then the problem is going to be to make the same kind of conclusions persuasive to the Congress.

To what extent can the analyses that are persuasive within the Executive Branch be communicated to the Congress with the hope that they may be persuasive there, also?

It seems to be quite a jump from downtown to the Hill, and often the Hill does not have the kind of analysis that has been persuasive to the Executive Branch.

Dr. SCHLESINGER. I think we should do more in making particular analyses available to Congress. As a standard practice, there would be problems, as you will recognize. Because of the pressures that exist, when a document goes public in that manner, analysts or the agencies that control the documents will be inclined to pull their punches. We would therefore have a watering down of the quality of the documents within the Executive Branch, if it is anticipated that they will necessarily go to Congress.

However, I think that the analytical reasoning in many cases can and should be conveyed to Congress.

Analysis is closely tied to program budgeting. In formulating the budget, as you know, we are very much responsive to Congressional desires, and particularly the desires of the Appropriations Committees. If the Appropriations Committees desired budgets in program form, we would be happy to respond.

To the extent that program budgeting is a major part of the PPBS, it is important, I think, for Congress to take into consideration whether it, too, wishes to receive its information in programmatic form.

In addition, I would think that Congress, itself, might want to make use of analytical staffs or analytical institutions that are responsive to the special responsibilities of the Congress. It might then be better able to evaluate the material coming forward from the Executive Branch, which is not always of uniform quality or of uniformly high quality.

ORGANIZATION AND STAFFING OF BUDGET BUREAU

Dr. FARBER. I have a question along the same line you have just been discussing.

In a recent account of the retirement of Phillip S. Hughes as Deputy Director of the Bureau of the Budget, he pointed out that he felt that there had been a shift in the role the Budget Bureau should assume, from just trying to make sure the Government's functions were handled in an economical way to an evaluation of the priorities. He made the charge that the Budget Bureau has failed to evolve and keep pace with

the needs of the Government and, apparently, that the Budget Bureau needs reorganization in terms of its structure, as well as more staff.

What is your feeling about the numbers of Bureau personnel and the organization of the Bureau being adequate to handle the tasks?

Dr. SCHLESINGER. The staffing problem, I think, is a serious one.

As you know, we are about the same size as we were back in the period right after the Second World War.

Dr. FARBER. That is what Mr. Hughes says. He comments that the Budget Bureau still employs fewer persons—just over 500—than it did when he joined the Bureau in 1948.

Dr. SCHLESINGER. We will be moving up in the 1970 budget. But we are in the same range that we were in the late forties, and the budget has increased fivefold in that period. So there is little doubt that there are some areas where we could use additional manpower effectively.

One of the problems over the years is that the Bureau has worn a hair shirt. It has been felt that in recommending economy to other agencies of the Government, that the Bureau should set an example of stringent economy.

I think that notion may have been pushed too far, that in economizing on personnel within the Bureau we have been penny-wise, pound-foolish.

This has become a problem of increasing concern to us.

I think that some of the non-examining functions of the Bureau—the Office of Executive Management, for example—probably require strengthening. Their performance has suffered from manpower restrictions. The program evaluation staff has not grown.

I suppose I am beginning to make mournful sounds. But at this stage of the year, a significant part of the Bureau staff will put in more than a hundred hours overtime per month. That is asking too much of some of the people in the affected offices or divisions.

We should have sufficient staff so that we do not ask sacrificial exertions on the part of our people. Unlike many other agencies of the Government, overtime is contributed labor on the part of the Bureau staff. They do not get overtime payment.

On the question of priorities, of course, the initial objective of the Bureau when it was established in 1922, was not to raise questions about priorities. It is inevitable, it seems to me, that an organization of this sort would have to take priorities into account. So the self-denying ordinance of 1922 may have sounded good on paper, but it tended to blind people to the real problems.

We ought to do more to respond to priorities and the way they change. We must be responsive to Presidential priorities. We should also be alert to changes in the public's notion of what is appropriate. However, I think we should be extremely circumspect in shaping priorities. That strikes me as going beyond the Bureau's function.

Dr. FARBER. Wouldn't you say that the training of the functional expert so that he is concerned with the matter of priorities might have some disadvantages?

I am thinking of your earlier reference to taking the functional specialist in water resources and training him in the tools of PPBS, and so on.

Most of the problems that we are talking about are competing interests, and they are inter-disciplinary and inter-functional in char-

acter. Isn't there a danger here, using this kind of functional specialist?

Dr. SCHLESINGER. Yes; there is. When the troops learn the lingo and learn to use it effectively, they may be able to sell proposals which they shouldn't sell—just because they have learned the right words to use, the buzz words or the plus words. That is something of a problem.

An increase in knowledge need not necessarily be beneficial, but our article of faith is that it should be beneficial on average.

In many cases, the improvement of the capabilities of personnel in an agency will lead them to question some of the presuppositions of the agency, the liturgy that the agency employs or its ideology. That would be advantageous. Whether they can effectively question it within the agency, or whether they become, as it were, the agency's advocate to the PPBS types is a very good question. I think from the standpoint of the individual, himself, he would be benefited.

IMPACT OF PPB

Dr. FARBER. I have been interested in this report that came from Edwin L. Harper, Fred A. Kramer and Andrew M. Rouse, entitled "Implementation and Use of PPB in 16 Federal Agencies." It was begun, I believe, with the cooperation of the Bureau of the Budget. In that report the authors come to the conclusion, in surveying a number of responses that "the planning, programming and budgeting functions are not performed much differently in most agencies than they were before the introduction of PPBS."

Allen Schick's statement in his recent study *PPB's First Years: Premature and Maturing* was, "The fact is that very few budget decisions have been the product (or even the byproduct) of PPB. The repeated citation of HEW's Maternal and Child Health Care study suggests the paucity, not an abundance, of PPB success stories."

In connection with that, there are two questions I would like to raise with you:

First, do we have a number of additional success stories that can now be cited as examples of successful PPB studies?

Dr. SCHLESINGER. I think we do. I wouldn't try here to provide such a list.

Dr. FARBER. But this is not unique any more?

Dr. SCHLESINGER. This is not unique, but, in some respects, it is not all that frequent.

I think one point can be made: what we are trying to accomplish is not that the decisions are a direct product of PPBS, but that PPBS analysis be taken into account. Formal PPBS may even be a by-product. The important question is: when you look at the universe of proposals, is it the ones that are supported by analytical endeavor that get accepted?

We must recognize, I think, that agencies will send forward an array of proposals, and that in most cases their fundamental objective is not to make analysis successful. They are trying to get proposals accepted. If they find analysis useful, they will use it. That will result in the public's benefiting from better constructed programs.

I will add that in the first four years, let's say, much of the work regarding PPBS outside the Department of Defense was simply

getting program budgeting established, simply establishing the structure. In the case of many agencies, the structure was admittedly superficial. It was developed to satisfy a Presidential order. We are hoping that that changes now.

I think we see some signs of progress in which the agencies are taking the product more seriously rather than simply pointing to the superstructure.

Senator GURNEY. Doctor, I wonder if you can cite for the record some specific examples of how PPB works practically and effectively. This would be very important, I think.

Dr. SCHLESINGER. Yes, sir.

(The information requested follows:)

SEVERAL EXAMPLES ARE GIVEN BELOW, THE MAJORITY OF WHICH WERE PERFORMED DURING 1969

1. A study showing the costs and benefits of the Liquid Metal Fast-Breeder Reactor development was used to determine the desirability of the \$3-5 billion investment and has been used for determining budget decisions and the pacing of the program.

2. Analysis of nutritional needs and alternative ways to fulfill that need was used to redirect the Food Stamp and other related programs.

3. A study examining the proportion of low-income students in various types of colleges and universities is being used for establishing priorities for allocating Federal subsidies.

4. Analysis of the Nation's housing stock and needs in future years was useful in developing the 10-year housing goal contained in the Housing and Urban Development Act of 1968.

5. The analysis of disease control, including cancer and arthritis, assessed alternative means of abetting the control of these diseases and has been useful in redirecting programs in this area.

6. An analysis of advantages and disadvantages of alternative income maintenance and social and rehabilitation service programs, 1970-71, was useful in developing the Family Assistance Program and redirecting other programs.

7. A study of the growing-cycle of Douglas Fir timber has helped to identify more productive cutting policies which in turn has helped combat needless inflation in lumber prices.

8. Analysis of manpower training programs suggested that OJT cost the Federal Government less to train given groups of people than institutional training with equal or greater success; as a result, a major redirection in emphasis away from institutional to OJT occurred including the establishment of the JOBS program.

9. A study of the cost of misusing drugs and the relative benefits of concentrating public enforcement on particular drug-use was useful in considering the need for redirecting Federal programs.

10. A study of oil shale development was used in developing Federal programs in this area.

11. An evaluation of the Work Incentive Program was useful in developing the Family Assistance Program.

12. Analysis of IRS audit policy was useful for allocating manpower and ADP resources and determining level of budgets.

13. Analysis of changing supply and demand conditions for helium is being used to consider redirecting affected programs.

14. Analysis of the optimum methods of handling the large volumes of cases concerning taking of lands by the Government has helped redirect the process and produce substantial savings.

15. A study of the costs and benefits of various frequencies of Apollo flight launches is being used to determine the program for the 1970's.

16. Analysis of cost and benefits of Vocational Rehabilitation was useful in reaffirming the value of the program and in considering ways to redirect the program.

17. The study of the optimum method of supply of common-use government commodities has developed criteria for selecting the least costly way of supplying agency customers and is being used for such selections.

18. A study of alcohol consumption and highway safety has helped to identify major causes of highway accidents and is helping to redirect Federal highway safety programs.

19. Analysis of the Neighborhood Development program was used in establishing project priorities and budget levels for the Urban Renewal program.

20. A study of the costs and benefits of nuclear rocket R&D is being used to consider the nature of future space expenditures and the usefulness of the program.

21. Studies of the Peace Corps on an intra-country basis have led to shifts of Peace Corps Volunteer resources into more promising areas.

22. Studies of methods of checking incoming shipments for customs purposes have led and are presently leading to changes in examination techniques.

23. A study of costs and benefits of alternative operations and investments in Gaseous Diffusion Plants is being used to redirect the program.

24. Evaluation of the Rural Electrification Administration loan program has led to proposals for development of a bank to meet the expanding needs of rural cooperatives.

25. Analysis of the Supersonic Transport identified monetary and non-monetary returns from the potential investment which was useful in evaluating public policy in this area.

26. Analysis of the Head Start program revealed that initial gains realized by enrollees disappeared in later years which led to the selection of enrollees for enriched services in later school years (Follow Through Program).

27. Analysis of the Job Opportunities in the Business Sector (JOBS) program identified administrative problems and that trainees reached do not stay on the job and are not adequately replaced; it is being used for decisions affecting funding levels and improvements in administration of the program.

28. A study showed that the U.S. Merchant Marine Fleet could be substantially rebuilt and become competitive with little increase in Federal support by stressing Standard Ship design, multi-year procurement, and offering incentives to ship operators.

29. Analysis of the allocation of civil rights enforcement resources has resulted in shifts of manpower and organizational changes.

30. A study showed that a decrease in search and rescue manning levels could be effected without any expected losses in terms of deaths prevented or lives saved; it has been used for improving the affected programs.

31. Analyses of Peace Corps training programs have led to changes in training techniques and emphases.

32. Analysis of the summer Head Start program shows insignificant measurable gains and has resulted in a shift of resources to the full-year program.

33. A study of alternative research programs for law enforcement has helped identify areas of highest priority for research.

34. A study of alternative automobile replacement patterns comparing costs of using basic sedans in the Government's fleet for various lengths of time is being used to consider changes in the current policy.

35. A study of interagency motor pools which determine the least cost method of supplying the demands for motor pool services under various conditions has been used to determine the optimum size of motor pools.

36. Studies of the Job Corps identified several major problems which have been used to decide funding levels, to close low-quality centers, to opening new centers, to redirect the entire program towards local communities and to relate it with other manpower training programs more closely.

Dr. FARBER. I think it is important to the study of the PPBS that we have some examples of studies that have actually been effective and persuasive.

Are they confidential or are they available to the public?

Dr. SCHLESINGER. It varies. For example, the Atomic Energy Commission published its breeder reactor study, I think with considerable pride, and justifiable pride. The Commission was persuaded by the Bureau to undertake the study of a program which will involve over the course of a number of years an expenditure of public funds of upwards of \$3 billion, which is no insignificant amount.

When one talks about the success of these matters, here is a case in which the agency was aided through analysis. The appraisal of the program would have been tougher and more skeptical, from the agency standpoint, if the analysis were not there.

We do have the problem that the impact of analysis is frequently the reduction or elimination of programs, or greater skepticism about programs. That is not always regarded as a success by all the parties concerned.

Dr. FARBER. Those are all the questions I have.
Senator GURNEY. Mr. Perle.

ROLE OF SYSTEMS ANALYSIS IN CURRENT DEFENSE PLANNING

Mr. PERLE. To what extent have the recent changes in the Defense Department budgeting procedures affected the potential for the continued application of systems analysis in the Office of the Secretary of Defense?

Dr. SCHLESINGER. I don't think that changes in the Department of Defense have affected the potential for the application of systems analysis. However, the structure is now somewhat different than it was in the past.

Secretary Laird has moved to decentralize decision-making to a considerable extent. The Services now have much more responsibility than they did under Secretary McNamara. The Services are charged with more management responsibility. They will be held accountable for failures and, in that sense, they will be subjected to review by the Office of the Secretary of Defense.

But the desire of both Secretary Laird and Secretary Packard is to move away from a situation in which the Office of the Secretary of Defense manages the Services in detail. This change, I think, is of considerable importance and somewhat changes the role that the Office of Systems Analysis had under Secretary McNamara and under Secretary Clifford.

The Office now has become one which is used more for staff review purposes. It will have less of a program initiation role than it had. That would not, in my judgment, preclude in any way the Office having considerable influence on the Secretary or the Deputy Secretary when the Office has, as it frequently has, a powerful position to present.

We are satisfied that Secretary Laird intends to continue to have the analytical function performed within the Pentagon. He, like all other heads of agencies, is obligated to maintain an analytical capability in accordance with Bulletin 68-9. How he wants to use that capability is, to some extent, a matter for his own decision.

I might add that the Secretary of Defense himself has decided that there would be a reduction in the direct management role of the Office of the Secretary of Defense. He wants the Services to play more of a role.

Mr. PERLE. Does this mean that the Services will be taking on some of the analytical functions that have been performed in the Office of Assistant Secretary for Systems Analysis?

Dr. SCHLESINGER. To my knowledge, and you would have to consult the people over at Defense, there is no intention of reducing the analytical staff that presently exists in the Office of the Secretary.

Also, the Services have had analytical staffs of their own for some time.

The Services recognize that they now have a responsibility that they have not had in many years. They, themselves, are interested in seeing that they perform well, so that everyone will recognize that that responsibility has rightly been decentralized. I am sure, therefore, that they will be utilizing their internal analytical capabilities to the best of their ability.

WILL THE DECISION-MAKER TOLERATE ANALYSIS OF HIS OWN HOBBY
HORSES?

Mr. PERLE. I would like to go back once again to your memorandum on "Uses and Abuses of Analysis." In that piece you expressed concern that decision-makers might not tolerate analysis, at least where their favorite programs were concerned.

From your new perspective in the Bureau of the Budget, has this concern been borne out? Is it better or worse than your expectations?

Dr. SCHLESINGER. I think that it is about the same as I would have expected, in the sense that this is inevitably part of the problem.

We point out frequently that analysis is not a scientific instrument for decision-making, that its purpose is to educate the judgment and the intuitions of the decision-maker. But the decision-maker must want to avail himself of that opportunity. Decision-makers do vary considerably.

I think over the course of the months ahead, President Nixon's interest in this area will result in an increased desire of agency heads to avail themselves of the potential of analysis. Secretary McNamara, of course, was a rather unique individual. He not only permitted himself to be educated by analysis; he seized it and made it a very personal kind of instrument. Others will not desire to use it in the same way, even though they may be anxious to avail themselves of its benefits.

USE OF ANALYSIS BY BUDGET BUREAU

Mr. PERLE. To what extent is the Bureau of the Budget able to conduct its own systems analyses from the ground up in an effort to reconcile conflicting agency analyses? Are you equipped to do that? Have you the staff to handle that? Are you really in a position to evaluate and analyze studies from an agency that might have taken considerable resources to produce?

Dr. SCHLESINGER. It depends. On broad cross-agency problems, on the broad functions of the Government, I think it would strain our capability to perform analysis from the ground up on a broad scale. For most of the analyses that come to us, we are fully capable of evaluating them.

In addition to the Office of Program Evaluation with which you are familiar, I think some of our best analysts are the people in the divisions, the examiners of the agency. Many of them are just crackerjacks.

ZERO-BASE BUDGETING DEFINED

Dr. TUFTS. I have one small point for clarification.

In your opening statement, you referred to zero-base budgeting. I am not sure everyone will understand what zero-base budgeting is. Can you amplify that?

Dr. SCHLESINGER. Perhaps I should.

The notion that lies behind zero-base budgeting is that most budgeting is done on an incremental or marginal basis. If an agency comes forward with a program request which is more or less in the form of last year's request, then it will not be challenged. It may escape attention because it is not new, and is not changing things. That is undesirable, because it means that year after year you carry programs at a specific level of effort, when the original need for the program may have disappeared.

It is not appropriate to leave unanalyzed, those large parts of the budget which are not incremental. We do not intend to leave them unanalyzed. We are going to challenge programs, and we will not ignore them simply because they have not asked for an increase.

Zero-base budgeting goes a good bit further. It means that, instead of accepting the established base of the program and challenging only the increments, that you assume that the base should be zero. The agency must therefore every year or every couple of years, justify the base of the program rather than just the incremental amounts.

I think on the basis of efficiency calculations we should do that. But there are these other aspects which policy-makers will have to take into account. They cannot overlook the fact that there are considerations other than efficiency. There are the distributional questions; there are political realities, too. If zero-base budgeting were to be implemented in the decision-making process, it would result in violent disruption of the expectations of large groups in the public and within the Federal administrative structure.

There is one additional point, however. When we talk about new initiatives, that is inherently zero-base budgeting. New initiatives are especially appropriate areas for analytical concern. By careful analysis of the programs, as they are created, we may be able to get much greater effectiveness for the resources invested.

Senator GURNEY. Thank you, Dr. Schlesinger.

We wish we had more time to go into this with you. However, we are on a very busy schedule right now, with votes on the Senate floor.

Thank you very much for your appearance today.

The subcommittee will recess, subject to the call of the Chair.

(Whereupon, at 12:30 p.m., the subcommittee recessed, to reconvene at the call of the Chair.)



Documents and Comment

90th Congress }
1st Session }

COMMITTEE PRINT

PLANNING-PROGRAMMING-BUDGETING

OFFICIAL DOCUMENTS

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FOREWORD

On August 25, 1965, President Johnson initiated a Planning-Programming-Budgeting System (PPBS) throughout the executive branch, to be supervised by the Bureau of the Budget. The Subcommittee on National Security and International Operations is now reviewing the application of this system in the national security area.

The President stated that this planning and budgeting system will "present us with the alternatives and the information on the basis of which we can, together, make better decisions." On March 17, 1967, the President said:

Under PPBS, each department must now:

Develop its objectives and goals, precisely and carefully;

Evaluate each of its programs to meet these objectives, weighing the benefits against the costs;

Examine, in every case, alternative means of achieving these objectives;

Shape its budget request on the basis of this analysis, and justify that request in the context of a long-range program and financial plan.

The government-wide application of PPB systems, similar to that of the Department of Defense, is not without problems and risks. Most executive departments and agencies, in the words of Charles J. Hitch, "are still struggling manfully to learn just what this means and how to comply."

The purpose of this publication is to make available to the subcommittee the Presidential directive of August 25, 1965, and the texts of related Presidential statements and of current Budget Bureau guidelines.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

JULY 26, 1967.

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PRESIDENTIAL DIRECTIVES AND STATEMENTS

**STATEMENT BY THE PRESIDENT TO CABINET MEMBERS
AND AGENCY HEADS ON THE NEW GOVERNMENT-WIDE
PLANNING AND BUDGETING SYSTEM, AUGUST 25, 1965**

I have asked you to meet with me this morning to discuss the introduction of a new planning and budgeting system throughout the Government.

The objective of this program is simple: to use the most modern management tools so that the full promise of a finer life can be brought to every American at the least possible cost.

This program is aimed at finding new ways to do new jobs faster, better, less expensively; to insure sounder judgment through more accurate information; to pinpoint those things we ought to do more, and to spotlight those things we ought to do less; to make our decision-making process as up-to-date as our space-exploring equipment. In short, we want to trade in our surreys for automobiles, our old cannon for new missiles.

Everything I have done in both legislation and the construction of a budget has been guided by my deep concern for the American people—consistent with wise management of the taxpayer's dollar.

In translating this principle in action, and with the help of an outstanding Congress, we have passed more progressive legislation than in any comparable period in history.

We have been compassionate. We have also been prudent.

But we can and must do better if we are to bring the Great Society closer to all the people.

Good government demands excellence.

It demands the fullest value for each dollar spent. It demands that we take advantage of the most modern management techniques.

This is what I want to introduce today—a new planning-programming-budgeting system developed by our top management experts led by Budget Director Charles Schultze. Once in operation, it will enable us to:

- (1) Identify our national goals with precision and on a continuing basis
- (2) Choose among those goals the ones that are most urgent
- (3) Search for alternative means of reaching those goals most effectively at the least cost
- (4) Inform ourselves not merely on next year's costs, but on the second, and third, and subsequent year's costs of our programs
- (5) Measure the performance of our programs to insure a dollar's worth of service for each dollar spent.

This system will improve our ability to control our programs and our budgets rather than having them control us. It will operate year

round. Studies, goals, program proposals, and reviews will be scheduled throughout the year instead of being crowded into "budget time."

To establish this system and carry out the necessary studies, each of you will need a central staff for program and policy planning accountable directly to you. To make this work will take good people, the best you now have and the best you can find.

I intend to have the 1968 budget and later-year programs presented in this new form by next spring.

With these programs will go the first studies produced by your planning and policy staffs.

It is important to remember one thing: no system, no matter how refined, can make decisions for you. You and I have that responsibility in the executive branch. But our judgment is no better than our information. This system will present us with the alternatives and the information on the basis of which we can, together, make better decisions. The people will be the beneficiary.

The Budget Director has already talked to most of you about the need for this new approach. He is now preparing plans for setting it up. He is ready to help you in any way he can.

Within the next several weeks he will send out detailed instructions for incorporating fiscal year 1968 and later-year programs into this system. But to make this new plan a success, he will need your full support. I know that you will give him that support.

[Public Papers of the Presidents of the United States, Lyndon B. Johnson, 1965. Book II]

STATEMENT BY THE PRESIDENT ON THE NEW GOVERNMENT-WIDE PLANNING AND BUDGETING SYSTEM, NEWS CONFERENCE OF AUGUST 25, 1965

This morning I have just concluded a breakfast meeting with the Cabinet and with the heads of Federal agencies.

I am asking each of them to immediately begin to introduce a very new and a very revolutionary system of planning and programming and budgeting throughout the vast Federal Government, so that through the tools of modern management the full promise of a finer life can be brought to every American at the lowest possible cost.

Under this new system each Cabinet and agency head will set up a very special staff of experts who, using the most modern methods of program analysis, will define the goals of their department for the coming year. Once these goals are established, this system will permit us to find the most effective and the least costly alternative to achieving American goals.

This program is designed to achieve three major objectives:

It will help us find new ways to do jobs faster, to do jobs better, and to do jobs less expensively.

It will insure a much sounder judgment through more accurate information, pinpointing those things that we ought to do more, spotlighting those things that we ought to do less.

It will make our decision-making process as up-to-date, I think, as our space-exploring program.

Everything that I have done in both legislation and the construction of a budget has always been guided by my own very deep concern for the American people—consistent with wise management, of course, of the taxpayer's dollar.

So this new system will identify our national goals with precision and will do it on a continuing basis. It will enable us to fulfill the needs of all the American people with a minimum amount of waste.

And because we will be able to make sounder decisions than ever before, I think the people of this Nation will receive greater benefits from every tax dollar that is spent in their behalf.

[Weekly Compilation of Presidential Documents, Monday, November 21, 1966, Vol. 2, No. 46]

MEMORANDUM FROM THE PRESIDENT TO THE HEADS OF DEPARTMENTS AND AGENCIES ON THE GOVERNMENT-WIDE PLANNING, PROGRAMMING, AND BUDGETING SYSTEM, NOVEMBER 17, 1966

There is no subject of greater importance to the people of this country and to me than the efficient and effective operation and evaluation of our programs. At my recommendation, the Congress has entrusted the executive branch of the Government with a wide variety of far-reaching social programs of unparalleled significance in the history of this country. It is essential that we in the executive branch, as the trustees of the public's funds appropriated for these programs, make certain that they are operated at a maximum level of efficiency and effectiveness for all Americans, and particularly for the people they are designed to reach. This can only be accomplished by bringing into the Federal Government the most modern management techniques available through our free enterprise system in American business.

My deep concern to make certain that this be done was the basis for my memorandum of August 25, 1965. That memorandum directed the institution of a Government-wide planning-programming-and budgeting system of the type that has proven successful in so many wide ranging, large corporate and defense and space activities. We now are receiving the benefits of the first year's experience with this system. Some agencies have put it into effect even more rapidly than we anticipated. Too many agencies, however, have been slow in establishing effective planning-programming-and budgeting systems. And, even when established, they have often not been used in making top management decisions. It is my desire that every agency of the Federal Government have such a system, and use it effectively.

For through this system, as I stated at the outset, we will have the ability to

Identify our national goals with greater precision.

Determine which of those goals are the most urgent.

Develop and analyze alternative means of reaching those goals most effectively.

Inform ourselves accurately of the probable costs of our programs.

Improve the performance of the Federal Government to insure the American taxpayer a dollar's worth of service for each dollar spent.

It is clear that these are not easy tasks. In too many cases the quality of analysis needs substantial improvement. I recognize that it takes time to develop the personnel, the skills, the data, and the understanding of what needs to be done. But it is essential that all of us work to reduce this time to a minimum. This means that you must:

Train and recruit the necessary staff.

Subject your objectives, programs, costs, and accomplishments to systematic and continuous review.

Search for new and more effective ways of accomplishing their objectives.

Relate analysis explicitly to budget requests so that those requests follow from and support comprehensive and well-thought-out agency plans.

Most important, this effort requires your personal interest and participation. Objectives will not be questioned unless you make it clear you want them questioned. Existing programs will not be evaluated critically unless you insist upon it. Alternatives will not be presented unless you demand them. The hard choices will not be made well unless you make them, and do so on the basis of critiques and analyses prepared by your own staffs. Getting these things done is up to you.

I intend, on a Government-wide basis, to question objectives, evaluate progress, seek alternatives, and make the hard choices on the basis of careful analyses. And I want you to do the same thing within your agencies. I have, therefore, asked the Budget Director to sit down with each of you to review your planning-programming-budgeting systems and give you his objective analysis of its effectiveness.

He will then report to me on a quarterly basis, beginning with the first quarter of calendar 1967, on the progress of your implementation of my directive.

As I make my budget and legislative decisions in the period ahead, I will look to the materials you have produced in the planning-programming-budgeting system process for your appraisal of priority needs and the most effective ways of meeting them.

[Weekly Compilation of Presidential Documents, Monday, January 30, 1967, Vol. 3, No. 4]

**PLANNING-PROGRAMMING-BUDGETING SYSTEM, EXCERPT
FROM THE PRESIDENT'S BUDGET MESSAGE TO THE
CONGRESS FOR FISCAL YEAR 1968, JANUARY 24, 1967**

Our most comprehensive effort to improve the effectiveness of Government programs is taking place through the Planning-Programming-Budgeting system. This system, which was initiated throughout the executive branch a little over a year ago, requires all agencies to:

Make explicit the objectives of their programs and relate them carefully to national needs;

Set out specific proposed plans of work to attain those objectives; and

Analyze and compare the probable costs and benefits of these plans against those of alternative methods of accomplishing the same results.

This system is primarily a means of encouraging careful and explicit analysis of Federal programs. It will substantially improve our ability to decide among competing proposals for funds and to evaluate actual performance. The full effects of this effort will not be felt until next year and later, as the necessary data are gathered and analyses now in progress are completed.

A few examples of the kind of work which is in progress indicate the wide range of matters to which organized analysis and programming can be applied.

Disease control.—The Department of Health, Education, and Welfare has completed an analysis of the relative cost and effectiveness of selected disease control programs. Cost per life saved and other criteria of relative effectiveness were developed. These programs are being reviewed and funding priorities are being re-examined in light of these findings.

Child health.—The Department of Health, Education, and Welfare completed an analysis of alternative programs aimed at reducing infant mortality and improving child health. This analysis led to the legislative program focused on early identification and treatment of needy handicapped children and experimental projects aimed at improving delivery of medical care to children.

Urban planning.—Experimental projects in urban planning designed to link planning with budgeting are underway at the local level. These efforts should produce a more effective allocation not only of Federal outlays but also of local resources.

Agricultural research.—On the basis of a long-range study conducted by the Department of Agriculture and the land grant universities, a new set of priorities for agricultural research has been established. Increasing emphasis is being given to research on improvement of nutrition and health, efficient low-cost housing, improved community services, and other means which can help directly in raising the level of rural living.

Tax administration.—As a result of intensive analyses of the tax administration system, Internal Revenue Service programs have been steadily improved to produce higher tax collections per dollar of cost, while strengthening the emphasis on equity and voluntary compliance on which our tax administration is based.

With its emphasis on developing better methods of accomplishing program objectives, the new planning-programming-budgeting system is also helping our Government-wide cost reduction program. We will continue to offset a significant part of increased costs of important new programs by increasing efficiency throughout the Federal Government. Savings from this source have been substantial during the past year under our drive for cost reduction. I have made it clear to the heads of all Departments and agencies that they are to continue their emphasis on cost reduction in the coming year.

The careful research and analysis which is required under the planning-programming-budgeting system does not just happen. It requires the efforts of intelligent and dedicated men and women. The

number of analysts required is not large—but the need for them is great. I urge the Congress to approve the funds requested in the budgets of the various Federal agencies to make possible this improvement in the management of Federal resources.

[Weekly Compilation of Presidential Documents, Monday, March 20, 1967,
Vol. 3, No. 11]

**PLANNING-PROGRAMMING-BUDGETING SYSTEM (PPBS),
EXCERPT FROM THE PRESIDENT'S MESSAGE TO THE
CONGRESS, THE QUALITY OF AMERICAN GOVERNMENT,
MARCH 17, 1967**

1. *Planning-Programming-Budgeting System (PPBS)*

More than a year and a half ago we began to apply a modern system of planning, programming, and budgeting throughout the Federal Government.

This system—which proved its worth many times over in the Defense Department—now brings to each department and agency the most advanced techniques of modern business management.

Analyzing other Federal programs from child development to tax administration, this system is forcing us to ask the fundamental questions that illuminate our choices.

For example, how can we best help an underprivileged child break out of poverty and become a productive citizen? Should we concentrate on improving his education? Would it help more to spend the same funds for his food, or clothing, or medical care? Does the real answer lie in training his father for a job, or perhaps teaching his mother the principles of nutrition? Or is some combination of approaches most effective?

Under PPBS, each department must now:

Develop its objectives and goals, precisely and carefully;

Evaluate each of its programs to meet these objectives, weighing the benefits against the costs;

Examine, in every case, alternative means of achieving these objectives;

Shape its budget request on the basis of this analysis, and justify that request in the context of a long-range program and financial plan.

This new system cannot make decisions. But it improves the process of decision-making by revealing the alternatives—for decisions are only as good as the information on which they are based.

PPBS is not costly to operate, but the dividends it will yield for the people of America are large.

The system has taken root throughout the government, but it will not be able to function fully until more trained men and women, more data, better cost accounting and new methods of evaluation are available.

To continue this vital work I urge that Congress approve the funds for PPBS requested in the budgets of the various Federal agencies.

BUDGET BUREAU GUIDELINES

**BUREAU OF THE BUDGET BULLETIN TO THE HEADS OF
EXECUTIVE DEPARTMENTS AND ESTABLISHMENTS:
PLANNING-PROGRAMMING-BUDGETING (PPB), JULY 18,
1967**

1. *Purpose.*—This Bulletin contains current guidelines for the continued development of integrated Planning-Programming-Budgeting (PPB) systems within agencies of the executive branch. It is not intended to change the instructions for the preparation of the 1969 budget previously communicated by letter to the agencies listed in section 1 of the Attachment, and it is consistent with the current revision of Bureau of the Budget Circular No. A-11. This Bulletin replaces Bulletin No. 66-3 and the supplement thereto.

2. *Application of instructions.*—The Bulletin applies in all respects to the agencies listed in section 1 of the Attachment. It is applicable not later than January 1, 1968, to the agencies listed in section 2. Agencies listed in section 3 should prepare to develop and integrate their planning and programming with budgeting as fully as practicable, but specific time limits are not prescribed herein. Bureau staff will be available for consultation on the nature, extent, and timing of the application of these instructions to the agencies listed in section 3.

3. *Principal objective of PPB.*—The principal objective of PPB is to improve the basis for major program decisions, both in the operating agencies and in the Executive Office of the President. To do this, it is necessary to have clear statements of what the decisions are and why they were made. Program objectives are to be identified and alternative methods of meeting those objectives are to be subjected to systematic comparison. Data are to be organized on the basis of major programs, and are to reflect future as well as current implications of decisions. As in the case of budgeting generally, PPB applies not only to current programs, but to proposals for new legislation. The budget is the financial expression of the underlying program plan. The budget review will therefore be conducted *primarily in program terms* for each agency to which this Bulletin applies. It is essential that the Program Memoranda, Program and Financial Plan, and Special Studies provide adequate bases for these decisions. The budget, however, is submitted and must be justified to the Congress in terms of individual appropriations. The program decisions must, therefore, be translated into appropriation requests, and the relationship of these requests to the program decisions must be clearly set forth.

4. *Elements of the system.*—The PPB system is built upon three types of documents:

a. *Program Memoranda* (PM) which succinctly present the agency head's major program recommendations to the President within a framework of agency objectives, identify the alternatives considered,

and support the decisions taken on the basis of their contribution to the achievement of these objectives;

b. A comprehensive multi-year *Program and Financial Plan* (PFP) which is periodically updated and presents in tabular form a complete and authoritative summary of agency programs (initially those recommended by the agency head and, subsequently, those adopted by the President) in terms of their outputs and costs; and

c. *Special Studies* (SS) which provide the analytic groundwork for decisions reported in the Program Memoranda.

The Program Memoranda and the PFP are organized around a program structure.

5. *Program structure*.—The program structure groups the activities of an agency into a set of program categories that facilitates analytic comparisons of the costs and effectiveness of alternative programs. Individual program categories establish the scope of the related Program Memorandum. The program categories should, therefore, be chosen so far as possible to permit a self-contained analysis of programs with common outputs or with common objectives.

a. The program categories used in each agency should provide a suitable framework for considering and resolving the major questions of mission and scale of operations which are the proper subject of decision at the highest level within the agency and within the Executive Office of the President. These program categories will not necessarily be consistent with appropriation categories or with organizational structures.

b. Normally, an agency will have between five and ten major program categories. Most program categories will contain one or more subordinate levels, called subcategories and program elements. Some of the subcategories and program elements will complement others within the same main category. Some may be competitive with others.

c. Each agency is responsible for proposing its own program structure and for reviewing it regularly and proposing its amendment where appropriate. The Bureau of the Budget should be consulted with respect to program structure and its approval obtained for changes therein.

d. The Bureau of the Budget will provide leadership in seeking to fit agency program structures into a Government-wide structure. As progress is made in this effort, agencies may be asked to adjust their structures to permit achieving a comprehensive and compatible structural pattern across agency lines.

6. *The Program Memoranda*.—Each agency should prepare a Program Memorandum (PM) for each program category.

The Program Memoranda should outline the broad program strategy upon which the agencies' plans and programs are to be built for the future years and provide background for the development of annual budget and legislative programs. They define long-range goals and objectives and anticipated program accomplishments.

a. With respect to the *annual* budget and legislative processes the Program Memoranda serve two major purposes:

(1) They contain the major program recommendations of each agency for the upcoming budget, and define authoritatively the strategy underlying those program recommendations. As such they convey the tentative program recommendations of the agency head, and also provide internal guidance for the preparation of the agency's

detailed budget submission. For this purpose, the Program Memoranda must record all of the major program decisions within each category.

(2) In addition to showing *what* choices have been made, the Program Memoranda should make clear *why* particular choices have been made, by identifying agency objectives in a measurable way, and comparing alternative programs in terms of their costs and their achievement of the objectives. In short, the Program Memoranda should provide an *explicit* statement of program strategy, with the basis for major program decisions explicitly stated. The documents should be concise enough to be used directly by agency heads and by the Director of the Bureau of the Budget.

b. The basic PM should stand on its own and in no case should it be longer than twenty pages. It should be prefaced by a two- or three-page summary.

c. The treatment of decisions in the Program Memoranda may vary. Wherever there are major policy issues relating to a program, the Program Memorandum should, at least, identify the issues in terms of the alternative courses of action among which choices must be made and the recommended course of action. Wherever possible, it should summarize the analytic basis for the choice. Where Special Studies carry the detailed analysis and have been made available, a Program Memorandum need only summarize the findings, making reference to the study reports without repeating their contents. Supporting analyses may also be contained in separate appendixes to the basic PM.

d. The limits imposed by the availability of analytic staff resources or other circumstances may in some cases make it impossible to provide full treatment of alternatives and their analysis in each Program Memorandum. Such instances will diminish as the PPB system is developed. Nevertheless, since the Program Memoranda are to constitute the principal basis for major program decisions in the budget review process, it is essential that such decisions in each program category be recorded in the PM and that the reason for the decisions be stated. Minor decisions will, of course, be reflected in the PFP and all decisions will be reflected in the appropriation requests. This selectivity will not only produce desirable brevity in the Program Memorandum, but will also permit the focusing of the limited number of studies that can be done on the issues where they can have the greatest effect.

e. When a program is an experimental one or a demonstration, the PM should clearly identify this fact. If it is necessary to proceed for more than one year on an experimental or demonstration basis, the PM should indicate why a decision to start a full-scale program is being postponed, what is being done to reach a conclusion on expansion or termination, and the date when a decision is expected.

f. The PM should deal explicitly with the legislative implications of the alternatives presented in it.

7. *Multi-year Program and Financial Plan.*—The PFP presents in tabular form, and for a period of several years, pertinent data relating to the outputs, cost, and financing of agency programs. These data are to be presented in a set of tables that reflect the decisions on agency programs contained in the Program Memoranda as well as minor program decisions not set forth there. The PFP should show the future implications of current decisions. The output and costs are to be

shown for each program element, grouped in terms of the program structure by category and subcategory, and for each year of the planning period covered by the PFP—the fiscal year just past, the current year, and the budget year, plus at least four future years.

a. *Presentation of future year data.* The years beyond the budget year are included primarily to show the future implications of current (past and present) decisions. This projection, therefore, is not designed to predict comprehensively future budget totals for agencies or for major programs.

(1) This approach permits, on the output side, a showing of the expected results of development or demonstration projects and the fruition of multi-year investment projects; and, on the cost side, a reflection of future requirements that are the results of program decisions for the budget year. For current decision-making purposes, this will make a more effective presentation where program levels are prescribed by law, where a program involves investments and future operating costs spread over several years, where program levels are determined by factors outside Government control (such as increases in population), or where a program is undertaken as an experiment or demonstration to provide a basis for future program decisions.

In the latter case, the PFP should identify, by a footnote, the year in which the next decision will be required on the program. Thus, if the current decision does not provide for full-scale operation of a program, costs and outputs should not be projected beyond the next decision point. (For major program decisions, the expected cost and output of the full-scale program, the evidence being accumulated to warrant expansion or termination, as well as the timing of the next decision point should, of course, be discussed in the PM.)

(2) Where an existing program is expected to continue throughout the planning period, but no decision has been made as to its future level, it should be shown at its current levels unless (a) mandatory or built-in changes are required under existing law, by uncontrollable workload, or by demographic or other factors, or (b) explicit justification for some other pattern is provided in the Program Memorandum (or if the decision is a minor one, reflected succinctly in a footnote to the PFP).

(3) The PFP therefore is to show the implications of current decisions and will not necessarily reflect accurate estimates of agency budget totals for the years beyond the budget year, because it omits new programs not yet recommended and fails to reflect program level changes, including the termination of some existing programs, decisions on which are not part of the current budget cycle. The fact that the PFP is designed to show the future implications of current decisions is *not* meant to imply that in Program Memoranda or Special Studies, or for their own internal use, agencies should not develop and evaluate alternative individual program policies, costs, and outputs for a five-year period. They are encouraged to do so. The PFP, itself, however, is meant to be a record of the present and future budgetary and output consequences of the current year's decisions. In brief, the long-run program strategy outlined and analyzed in the Program Memoranda need not—and in many cases should not—be confined to decisions taken in the coming budget. The data shown in the PFP, however, should.

b. *Outputs.* Table I of the PFP will display outputs—that is, a quantitative measure of end products or services produced by a

program element. Where it is meaningful to do so, outputs should be aggregated by subcategory and category of the program structure.

(1) Outputs by program element in Table I are to reflect the best measure of what is produced by that element. Outputs will not necessarily measure the achievement of a program objective, nor the benefits of the program. Such measures are vital to the PPB process—they should be identified as soon as practicable, and should be given full consideration in the Program Memoranda and Special Studies. Wherever meaningful measures of achievement and effectiveness are available for a program, the PFP should display them either on a separate line in Table I, properly identified, or by means of a supplementary table. In certain cases, such as research programs, where meaningful measures of output cannot be defined, the best available quantitative nonfinancial descriptions of the program should be used (e.g., the number of projects initiated, continued, and completed, number of research workers engaged, or the number of researchers trained).

(2) In some cases—a recreation program, for example—costs in the PFP may best be related to the capacity of proposed recreation facilities, and this might serve as the best output measure. Attainment of the objective of the program, however, may best be shown by a measure of the use of the facilities—which is an important factor for decision-making on the program. Both of these measures, therefore, are relevant and appropriate for presentation.

(3) In the case of an on-the-job training effort, the simplest measure of output in relation to cost might be the number of workers trained, or the student weeks of training supplied. The number of workers trained might also have added significance since it may reflect the diminution of dependence on public assistance. But the ultimate purpose of the program presumably is to improve the earning capacity of the worker trained. The best measure of the success of the effort, therefore, might be the increase in income that results from the training. It is possible that a program which showed "low output"—in terms of the numbers of workers trained—might be more effective on this criterion because it was better taught, or focused on skills in shorter supply, than a program that showed a higher "output."

(4) In short, where objectives are complex, as they often are for Government programs, it may be impossible to find a single, conceptually clear output measure that will satisfy all the needs of decision-making on a program. Basically, the PFP should show measures of what is produced as a result of a program effort, supplemented where appropriate by one or two other measures of achievement and effectiveness, with the relationship of these measures and the pertinent costs explained in the PM's and Special Studies.

c. *Costs.* Parallel to the display of output in Table I, Table II of the PFP presents a tabular statement of financial requirements in terms of program costs to be incurred for program activities. In addition to the display of program costs for each program element, the NOA requirements for the budget year for each program category should be set forth. Differences between budget year NOA and program cost that are greater than 10 percent of the larger item should be explained in a footnote. The definitions of "program cost" and "NOA" are those established by Circular No. A-11 for the program and financing schedules in the budget appendix. (Agencies desiring to use any

other financial concept in lieu of program costs should consult the Bureau of the Budget.)

(1) The financial data presented in the PFP for each program element should reflect total program costs inclusive of the program-oriented research and development, investment, and operating costs required to produce the output shown in Table I. Where there exists a significant difference between the total program costs and the costs funded by the particular Federal agency, both the cost to the given agency and the total net cost to other agencies, other units of Government, the private sector, or other sources, should be identified and shown in three separate lines—one for the given agency, one for other Federal agencies, and the third for all other sources.

(2) For programs financed with earmarked receipts or with their own generated receipts, such as loan programs, Government corporation activities, and revolving funds, Table II of the PFP should show the total level of resources committed or applied, as well as cost to the Government and obligational authority. In difficult or unusual cases, the agency should consult with the Bureau of the Budget on this display.

(3) It should be noted that costs in the PFP are defined in a more limited sense than the costs which may—and usually should—be utilized in the Program Memoranda or in Special Studies. For decision-making purposes, the analysis of a problem should include the consideration of economic opportunity costs, marginal costs, and systems costs.

(4) For the year immediately past, the presentation is to be based upon cost data that are adequately supported in the agency accounting system. Where the maintenance of specific accounts for program classifications is not justified as an efficient and practical approach, cost data for the past year may be developed through cost allocation or analysis techniques: in such cases there should be a technical note appended to the PFP to indicate the techniques used. Cost distribution practices should be so developed as to provide a suitable basis for program decisions and to provide to the managers concerned reliable information that will permit them to evaluate results actually obtained in relation to the resource allocation decisions made under PPB.

d. *Reconciliation of program costs to appropriations.* The PFP will include as Table III a reconciliation—a “cross-walk”—of the NOA shown for the budget year in the PFP, with NOA estimates by appropriation and fund account. However, this table need not necessarily go to the level of program element; and translation can be done at the level of program category or subcategory, whichever is appropriate. Similarly, for this purpose, appropriations or funds which are grouped into a single “building block” under Circular No. A-11 (for example, certain relatively inactive accounts) may also be so grouped for the purposes of this tabulation. The purpose is to provide a reconciliation between program costs and the budget submission, sufficient to insure that the budget submission is consistent with the intent of the program decisions. The PFP constitutes a link between the marginal systems costs in the PM that are pertinent to decision-making, and the financing needed to carry out programs.

8. *Special Studies.*—Special Studies are a vital element of PPB. By providing the analytic basis for decisions on program issues in the PM, they determine the quality of the PPB system’s contribution to

the decision-making process. Special Studies will, in general, formulate and review program objectives in terms useful for making program comparisons; they will review in terms of costs and benefits the effectiveness of prior efforts, compare alternative mixes of programs, balance increments in costs against increments in effectiveness at various program levels with attention to diminishing returns and limitations of physical resources, and assess the incidence of benefits and costs as well as their totals. Normally, a Special Study will not be co-extensive with a program category. Most will deal with specific phases of a program; some studies will cut across program category lines. In every case a Special Study will contain specific recommendations for future action. There is no fixed length or format for Special Studies.

A Special Study should normally be made whenever a proposal for major new legislation is involved. Such a study should spell out the purposes, costs, and expected accomplishments under the legislation, and the alternatives considered for accomplishment of the purpose.

9. *Timing for production of documents.*—PPB is a continuous process. The analytic work cannot produce once-and-for-all answers. Successive analyses should assist in producing successively better Government decisions and in responding to new initiatives and changing circumstances.

The decisions to which PPB contributes are basically incorporated in two annual processes—the annual executive budget of the Government and the annual legislative program of the President. Consequently, it is necessary that the preparation and presentation of PPB documents fit the schedules for these two processes. Similarly, the documentation under this instruction should be coordinated with and be consistent with the submissions made under Circular No. A-11 on the budget and Circular No. A-19 on legislation. In fact, the PM and the PFP are integral parts of each covered agency's budget submissions.

The timing for the major documents is as follows:

a. *Program Memoranda.* Program Memoranda will be drafted each year for each program category. The Bureau of the Budget will identify well in advance certain issues it may wish to have especially considered. The Bureau of the Budget will also generally indicate a staggered schedule of dates for the submission of draft Program Memoranda, usually over the period from February 15 through July 15. The draft Program Memoranda should contain or be accompanied by tables showing for the planning period the output and cost data covering at least the major issues dealt with in the PM for the given program category.

Wherever possible, the Bureau will respond to the draft PM with comments on recommendations and supporting rationale. Revisions should then be made in the PM to reflect the agency head's consideration of the Bureau's comments and to reflect any further developments in the agency analysis. The PM should then be submitted in final form by September 30.

b. *Program and Financial Plan.* The Program and Financial Plan is to be prepared annually and transmitted to the Bureau by September 30. It should be consistent with the Program Memoranda and the rest of the budget submission which is due at the same time.

The PFP should be revised as necessary for use within the agency to reflect major changes in the program plans taking place, but sub-

mission of any such revised PFP to the Bureau of the Budget is not required as a routine matter. The PFP should be revised for consistency with the President's budget in January. Where congressional action on the agency budget is completed appreciably ahead of September 30, a further revision would be appropriate to reflect such action.

c. *Special Studies*. Agencies should maintain a continuing program of Special Studies. These may extend over more than one year of the budget cycle and need not follow a uniform time pattern.

(1) A list of Special Studies contemplated by the agency should be submitted to the Bureau of the Budget not later than January 15, covering the new calendar year. The Bureau may make additional suggestions with reference to proposed studies, giving particular emphasis to studies which may be needed for the forthcoming budget cycle each year, and the dates by which such studies should be submitted. Special studies requested by the Bureau, and such others as the agency head believes appropriate for submission, should be forwarded to the Bureau as soon as they have been reviewed by the agency head. The Bureau of the Budget will give substantive and technical comment as promptly as feasible.

(2) Draft Program Memoranda and Special Studies should be submitted to the Bureau of the Budget in six copies, or such other number as may be requested by Bureau representatives. Each final PM and PFP should be submitted in the same number as is specified in Circular No. A-11 for annual budget submissions, or in such other number as Bureau of the Budget representatives may specify.

10. *Illustrative annual cycle*.—In summary, a typical annual cycle is as follows:

September: Agency submits PM's in final form, PFP's, the annual budget, and the annual legislative program to the Bureau of the Budget.

October–December: Bureau reviews and recommends to the President; Presidential decisions made and communicated to the agency.

January: Executive budget is presented to the Congress; major elements in the legislative program are indicated in the State of the Union message, the budget message, the economic report, or in other communications to Congress.

January: Agency reviews special study program and submits proposed list for the calendar year to the Bureau.

January: Agency updates the PFP to conform to the executive budget.

February: Bureau indicates to agency its request for Special Studies and for issues to be covered in Program Memoranda during the upcoming budget cycle.

February–July: Agency brings Special Studies to completion and prepares drafts of Program Memoranda.

April–August: Budget Bureau responds on Special Studies and draft Program Memoranda.

July–September: Agency head makes final decisions on his program recommendations; agency revises draft Program Memoranda; agency updates PFP, adding one year and making it conform to agency head recommendations.

Year around: Special Studies are begun, carried on and completed, as appropriate.

11. *Responsibility, staffing, and training.*—Responsibility for the development and use of Planning-Programming-Budgeting systems rests with the head of each agency. Since planning, programming and budgeting are all essential elements of management, it is necessary that line managers at appropriate levels participate in the system. Management responsibility should be so fixed that the agency head receives the recommendations of his principal managers on all major program issues. It may be desirable to provide principal managers with small analytic staffs to insure their meaningful participation in Special Studies and other analytic work. Similar arrangements for obtaining the views of other echelons may be made, consistent with the agency's assignment of responsibility.

a. Whether or not analytic staffs are provided the principal managers, each agency should establish a specialized analytic staff reporting directly to the agency head or to his deputy. The principal duties of this staff will be to coordinate the analytic and planning work done in the subordinate bureaus or other organizations of the agency; to initiate and conduct Special Studies; where appropriate, to provide first drafts of Program Memoranda; and to supervise or monitor research for program analysis.

b. Each agency should take such action as is needed to provide, within the management system of the agency, for an automatic provision of pertinent data on the results of the resource allocation decisions made under PPB. Agency information systems should be designed to provide timely data on outputs and costs in budget execution—suited to the needs of the managers concerned with agency programs—so that programs may be effectively carried out according to plans and related operating budgets, and to provide information useful for planning and programming in the next cycle of operations.

c. To make PPB a fully effective system, a general understanding of the methods and purposes of PPB must be created throughout the agencies. Agencies are, therefore, encouraged both to make maximum use of the various training and educational programs offered through the Civil Service Commission, and also to establish their own internal orientation and training courses.

CHARLES L. SCHULTZE,
Director.

Attachment.

ATTACHMENT

BULLETIN No. 68-2

Section 1:

Department of Agriculture
 Department of Commerce
 Department of Defense—separate submission for:
 Military functions (including Civil Defense)
 Corps of Engineers, Civil functions
 Department of Health, Education, and Welfare
 Department of Housing and Urban Development
 Department of the Interior
 Department of Justice

Department of Labor
 Post Office Department
 Department of State (excluding Agency for International Development)
 Department of Transportation
 Department of the Treasury
 Agency for International Development
 Atomic Energy Commission
 Central Intelligence Agency
 General Services Administration
 National Aeronautics and Space Administration
 National Science Foundation
 Office of Economic Opportunity
 Peace Corps
 United States Information Agency
 Veterans' Administration

Section 2:

Civil Service Commission
 Federal Communications Commission
 Federal Power Commission
 Federal Trade Commission
 Interstate Commerce Commission
 Securities and Exchange Commission
 Small Business Administration
 Tennessee Valley Authority

Section 3:

Export-Import Bank of Washington
 Federal Home Loan Bank Board
 Federal Mediation and Conciliation Service
 National Labor Relations Board
 Railroad Retirement Board
 Selective Service System

[Executive Office of the President, Bureau of the Budget]

**PROGRAM CATEGORIES: LISTING BY THE BUREAU OF THE
BUDGET, MARCH 15, 1967**

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Agency for International Development
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Post Office Department
 Department of State
 Department of Transportation
 Treasury Department
 Atomic Energy Commission
 General Services Administration
 National Aeronautics and Space Administration
 Veterans' Administration
 National Science Foundation
 United States Information Agency

Agency for International Development

The program categories for AID are the individual countries. The subcategories are the major economic sectors, i.e., Agriculture, Health, Industry and Education. The subcategories vary from country to country.

Office of Economic Opportunity

- A. Employment Assistance
 - 1. Job creation
 - 2. Job opportunity
 - 3. Vocational and job training
 - 4. Research and demonstration
- B. Educational Assistance
 - 1. Educational opportunity
 - 2. Curriculum improvement
 - 3. Facility improvement
 - 4. Faculty improvement
 - 5. Research and demonstration
- C. Other Social Assistance
 - 1. Health assistance
 - 2. Housing and community facilities assistance
 - 3. Community social services
 - 4. Loan assistance
 - 5. Economic development
- D. Income Maintenance
 - 1. Public assistance
 - 2. Social insurance
 - 3. Pension and retirement
- E. Basic Research
- F. General Support
 - 1. Headquarters

Peace Corps

- A. Program Direction and Support
 - 1. Direction
 - 2. Support
- B. Food Supply (the problem of hunger)
 - 1. General farming/Agriculture extension
 - 2. Livestock, dairy, poultry

3. Fisheries
 4. Farm related public works (irrigation, water, land clearing)
 5. Cooperatives (producer co-ops, marketing, credit unions)
 6. Nutrition, home arts, school lunch
 7. Community action/Agriculture
- C. Education (the problem of ignorance)
1. Elementary
 2. Secondary
 3. University
 4. Teachers training
 5. Other/Adult
- D. Health and Sanitation (the problem of sickness and disease)
1. Preventive health
 2. Medical care (curative)
 3. Health education
 4. Laboratory technicians
 5. Health related public works
 6. Community action/Health
- E. Public and Private Institutions (the problem of nation building)
1. Architecture, city planning, surveying
 2. Public administration and law
 3. Non-agricultural co-ops, small business counseling, credit unions and savings and loans
 4. Rural community development
 5. Urban community development

Department of Agriculture

- A. Agriculture and Forest Industries
1. Crops and livestock
 2. Timber
 3. General support
- B. People
1. Improvement of income
 2. Improvement of diets and nutrition
 3. Protection of health
 4. Improvement of housing
 5. Improvement of education and training
 6. General support
- C. Communities
1. Community planning
 2. Utilities and public facilities
 3. Outdoor environment
 4. General support
- D. International Trade and Development
1. Export trade expansion
 2. Developing economies
 3. General support
- E. General Support
1. General administration
 2. Program support

Department of Commerce

- A. Advancement of the Economy Through Industry and Commerce
 - 1. Economic analysis and description
 - 2. Resource requirements
 - 3. Science and technology in industry and commerce
 - 4. Intellectual-industrial property protection
 - 5. Business development
 - 6. International trade, finance and investment
 - 7. Promotion of travel to the U. S.
 - 8. Industrial mobilization
 - 9. Technological measurements and standards
 - 10. U. S. expositions
- B. Area and Regional Development
 - 1. Public facilities and environmental improvements
 - 2. Industrial development
 - 3. Human resources
 - 4. Natural resources
 - 5. Planning, information dissemination, and research
 - 6. Administration
- C. General Purpose Data Production and Statistical Services
 - 1. Economic data
 - 2. State and local government data
 - 3. Demographic data
 - 4. Analytical and composite data
 - 5. Statistical assistance and services
 - 6. Data processing equipment and systems development
- D. Physical Environment
 - 1. Weather forecasts and warning services
 - 2. Earth description, mapping and charting services
 - 3. Hydrographic and oceanographic services
 - 4. River and flood prediction and warning services
 - 5. Telecommunications and space services
 - 6. Environmental satellite services
 - 7. Environmental data services
 - 8. Research
- E. The Physical Measurement System
 - 1. Basic measurements and standards
 - 2. Matter and materials data and standards
- F. Transportation
 - 1. Inter-area
 - 2. Defense
 - 3. Research and development
 - 4. General support
- G. General Administration and Special Services
 - 1. Executive management
 - 2. Administrative and staff services

Department of Defense

- A. Strategic Forces
 - 1. Offensive forces
 - 2. Defensive forces
 - 3. Civil Defense

B. General Purpose Forces

1. Unified commands
2. Army forces
3. Navy forces
4. Fleet Marine forces
5. Air Force forces
6. (Not used)
7. (Not used)
8. Other

C. Specialized Activities

1. Intelligence and security
2. National military command system and communications
3. Special activities
4. Other activities
5. (Not used)
6. Military assistance

D. Airlift and Sealift

1. Airlift
2. Sealift
3. Traffic management and water terminals

E. Guard and Reserve Forces

1. Strategic forces (defensive)
2. General purpose forces
3. Specialized forces
4. Airlift and sealift
5. (Not used)
6. (Not used)
7. Logistics
8. Personnel support
9. Administration

F. Research and Development

1. Research—Army
2. Research—Navy
3. Research—Air Force
4. Research—ARPA
5. Research—DASA
6. Exploratory development—Army
7. Exploratory development—Navy
8. Exploratory development—Air Force
9. Exploratory development—ARPA
10. Advanced development—Army
11. Advanced development—Navy
12. Advanced development—Air Force
13. Engineering development—Army
14. Engineering development—Navy
15. Engineering development—Air Force
16. Management and support—Army
17. Management and support—Navy
18. Management and support—Air Force
19. Management and support—Other

G. Logistics

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2. Maintenance and service activities
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- H. Personnel support
 - 1. Training, medical and other activities
- I. Administration
 - 1. Command
 - 2. Undistributed adjustments
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Corps of Engineers

- A. Central and South Pacific
- B. Central Valley
- C. North Pacific
- D. Columbia River
- E. Missouri River
- F. Puerto Rico and Virgin Islands
- G. Colorado River
- H. Great Basin
- I. New England
- J. Middle Atlantic
- K. Ohio River
- L. Hawaiian Islands
- M. Alaska
- N. Souris-Red
- O. Upper Mississippi
- P. Great Lakes
- Q. Rio Grande
- R. Lower Mississippi
- S. Gulf (Texas)
- T. Gulf and South Atlantic
- U. Arkansas, White, Red

Health, Education, and Welfare

- A. Education
 - 1. Development of basic skills and attitudes
 - 2. Development of vocational and occupational skills
 - 3. Development of advanced academic and professional skills
 - 4. Individual and community development
 - 5. General research
 - 6. General support
- B. Health
 - 1. Development of health resources
 - 2. Prevention and control of health problems
 - 3. Providing health care
 - 4. General support
- C. Vocational Rehabilitation
 - 1. Rehabilitation for disabling conditions
 - 2. General rehabilitation
- D. Social Services
 - 1. Improving the social functioning of adults
 - 2. Improving the social functioning of the child and family
 - 3. Improving the organization and delivery of social services
 - 4. General support

- E. Income Maintenance
 - 1. Aged assistance
 - 2. Disability assistance
 - 3. Other individual and family support
 - 4. General support
- F. International
 - 1. Bilateral activities (State Department)
 - 2. Bilateral activities (AID)
 - 3. Bilateral activities (Other)
 - 4. Multilateral activities
 - 5. General support

Department of Housing and Urban Development

- A. Decent Housing for All Americans
 - 1. Through support of the private market
 - 2. Through supplements to the private market
- B. Improved Land Use for Suitable Community Environment
 - 1. Foster planning for community development and renewal
 - 2. Eliminate slums and blight
 - 3. Acquire land for orderly urban growth
- C. Effective Urban Transit and Other Public Facilities and Service
 - 1. Improve urban mass transportation
 - 2. Improve public facilities and services
- D. Support for State and Local Administration of Community Development Activities
 - 1. Promote coordination of Federal, State, and local urban development activities
 - 2. Provide research, information, and technical assistance support to State and local governments and agencies.
 - 3. Encourage education and training for efficient and economic urban development
- E. Management of Departmental Programs and Resources
 - 1. Obtain information needed for effective management
 - 2. Liquidate assets of terminated and other programs
 - 3. Provide technical services for other Federal agencies
 - 4. Provide executive direction and general support

Department of the Interior

- A. Water Supply and Control
 - 1. Water data, planning, training & assistance
 - 2. Water research
 - 3. International water activities
 - 4. Alaska
 - 5. Arkansas-White-Red basin
 - 6. Columbia-North Pacific basin
 - 7. Great basin
 - 8. Colorado basins (incl. S. California)
 - 9. Missouri basin
 - 10. Northern and central California basins
 - 11. Rio Grande-Pecos basin

12. Texas basins
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16. Ohio River basin
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21. Puerto Rico and Virgin Islands
22. Operation and maintenance
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 1. Technologic and research core—fossil fuels
 2. Information, support and regulatory functions—fossil fuels
 3. Special programs—coal
 4. Special programs—petroleum and natural gas
 5. Special programs—oil shale
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 7. Production of hydroelectric power
 8. Transmission and distribution of power
 9. Operation and maintenance of facilities
- C. Minerals Exploration, Production and Supply
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 3. Special programs—functional
 4. Special programs—commodities
- D. Land Services—Forage—Timber
 1. Land classification and disposition
 2. Timber production
 3. Livestock forage production
 4. Fire protection
 5. Allocation to forest service
- E. Aquatic Living Commercial Resources
 1. Development and management of the resources
 2. Assistance to the fishing industry
- F. Recreation Use and Preservation
 1. Planning and assistance
 2. Recreation research
 3. National parks and other natural areas
 4. Historic and cultural sites
 5. Wild rivers
 6. Wilderness
 7. Rare or endangered species
 8. National recreation areas and seashores
 9. Public lands
 10. Water projects
 11. Fish and wildlife recreation areas
 12. Scenic roads and parkways
 13. National recreation trails
 14. State and local areas (LWCF)
 15. National forest (LWCF)
 16. Migratory bird habitat and production

- 17. Other wildlife habitat and production
- 18. Fish habitat and production
- G. Earth—Environmental Study, Measurement and Enhancement
 - 1. Ecology and aesthetics
 - 2. Geology
 - 3. Geography
 - 4. Cadastral surveys
 - 5. Earth surface utilization and restoration
 - 6. Resource application of space
- H. Indians
 - 1. Alaska natives
 - 2. Northern plains and mountain tribes
 - 3. Navajo
 - 4. Other southwestern tribes
 - 5. All other tribes
- I. Territories
 - 1. Trust territory
 - 2. American Samoa
 - 3. Guam
 - 4. Virgin Islands
- J. General Support and Other Programs
 - 1. Executive Direction and administrative services
 - 2. Helium conservation, production, and supply
 - 3. Payments to the States and subdivisions

Department of Justice

(No program categories as yet)

Department of Labor

- A. Manpower Development Assistance
 - 1. Education
 - 2. Training
 - 3. Special manpower programs
 - 4. Work training
 - 5. Research
 - 6. Administration
- B. Employment Assistance
 - 1. Employment market information
 - 2. Placement services
 - 3. Special manpower programs
 - 4. Civil rights compliance
 - 5. Research
 - 6. Administration
- C. Income Maintenance
 - 1. Unemployment insurance
 - 2. Workmen's Compensation
 - 3. Pension and retirement
 - 4. Research
 - 5. Administration

- D. Wage and Labor Standards
 - 1. Wages and working conditions
 - 2. Occupational safety
 - 3. Utilization of women workers
 - 4. Research
- E. Labor-Management Relations
 - 1. Administration of the Labor-Management Reporting and Disclosure Act and the Welfare Pension Plans Reporting and Disclosure Act
 - 2. Veterans reemployment rights
 - 3. Labor-management relations assistance
 - 4. Research and policy development
 - 5. Administration
- F. Data collections, Analysis and Dissemination
 - 1. Manpower and employment statistics
 - 2. Prices and living conditions
 - 3. Wages and industrial relations
 - 4. Productivity and technological developments
 - 5. Industrial hazards
 - 6. Foreign labor conditions
 - 7. Research
 - 8. Administration
- G. General Support
 - 1. Executive direction and management
 - 2. Legal services
 - 3. International labor activities

Post Office Department

- A. Direct Service to Mailers
 - 1. Window and counter services
 - 2. Self-service installations
 - 3. Mail acceptance services
- B. Processing of Mail
 - 1. Mail processing at small post offices
 - 2. Mail preparation (at large offices)
 - 3. Outgoing distribution at surface letter centers
 - 4. Outgoing distribution—air mail
 - 5. Outgoing distribution at flat mail centers
 - 6. Outgoing distribution—paper mail centers
 - 7. Outgoing distribution at miscellaneous mail centers
 - 8. Outgoing parcel post distribution
 - 9. Incoming distribution
- C. Delivery Services
 - 1. Preparation for delivery
 - 2. Delivery at post offices
 - 3. Business route delivery (multi-trip)
 - 4. Residential route delivery (single-trip)
 - 5. Parcel post delivery
 - 6. Rural delivery
 - 7. Special delivery
 - 8. Miscellaneous delivery services

- D. Transportation
 - 1. Plant and platform
 - 2. Intracity transportation
 - 3. Intercity transportation
 - 4. International transportation
- E. Providing Auxiliary Services
 - 1. Mail-related services
 - 2. Financial exchange services to the public
 - 3. Nonpostal service—reimbursable
 - 4. Nonpostal services—nonreimbursable
- F. Enforcing Postal Laws
 - 1. Depredation
 - 2. Fraud and other prohibited mailings
 - 3. Other postal crimes
- G. Research and development
 - 1. General research
 - 2. Applied R&D for Category I (direct services to mailers)
 - 3. Applied R&D for Category II (processing of mail)
 - 4. Applied R&D for Category III (delivery services)
 - 5. Applied R&D for Category IV (transportation)
 - 6. Applied R&D for Category V (providing auxiliary services)
 - 7. Applied R&D for Category VI (enforcing postal laws)
 - 8. Applied R&D for Category VIII (general postal support)
 - 9. Other applied R&D (not category-oriented)
- H. General Postal Support
 - 1. Management and administration
 - 2. Management information systems
 - 3. General personnel support
 - 4. Budget and accounting
 - 5. Property administration

Department of State

(The program structure adopted last spring did not prove satisfactory. Work on a new program structure is stopped pending development of an interagency foreign affairs programming system.)

Department of Transportation

No program categories exist as yet. Previously program categories existed for several components but these are not shown here since the Department of Transportation has not had an opportunity to review them.

Treasury Department

- A. Administration of Government Finances
 - 1. Public debt
 - 2. Payments
 - 3. General activities
- B. Collection of Revenue
 - 1. Revenue accounting and processing
 - 2. Taxpayer assistance and services

3. Delinquent accounts operation
 4. Delinquent returns operation
 5. Audit of tax returns
 6. Tax fraud investigation—taxpayer in general
 7. Taxpayers appeals
 8. Alcohol and tobacco revenue and regulatory controls
 9. Collection of customs duties
 10. General activities
- C. Administration of National Banking System
1. Examination of national banks
 2. Organization of banks
 3. General activities
- D. Manufacture and Distribution of Coins, Currency and other Financial Instruments
1. Currency
 2. Coins of circulation
 3. Stamps
 4. Securities, commissions, certificates, etc.
 5. Medals and special coins
 6. General activities
- E. Special Law Enforcement
1. Tax fraud investigations—racketeer segment
 2. Alcohol and firearms investigations
 3. Other investigations
 4. Security responsibilities
 5. General activities
- F. Policy Determination and Related Activities
1. Office of the Secretary
 2. Offices of bureau heads

Atomic Energy Commission

- A. Procurement and Production of Source and Special Nuclear Materials.
1. Procurement of uranium concentrates
 2. Production of special nuclear materials
- B. Military applications
1. Nuclear weapons
 2. Military reactors
- C. Development of Space Applications
1. Nuclear rocket propulsion (ROVER)
 2. Space thrusters (POODLE)
 3. Space electric power development
- D. Development of Central Station Nuclear Power
1. Converter reactors
 2. Advanced converter and thermal breeder reactors
 3. Fast breeder reactors
 4. Desalting applications
 5. General research and development
- E. Development of Other Civilian Applications
1. Merchant ship propulsion reactors
 2. Terrestrial SNAP applications
 3. Isotopes development
 4. Civilian applications of nuclear explosives (Plowshare)

F. Basic Research

1. High energy physics research
2. Other physical research
3. Biomedical research

G. Nuclear Science and Technology Support

1. Supporting reactor development activities
2. Training, education and information

H. General Support

1. Community support
2. Program direction and administration
3. Security investigations
4. Cost of work for others
5. Revenues applied
6. Construction planning and design

General Services Administration**A. Facilities**

1. Acquisition
2. Management
3. Service direction

B. Supply Services

1. Provision of supplies
2. Supply management
3. Automated data management
4. Service direction

C. Other Property Management and Disposal Service

1. Inventory management
2. Property disposal
3. Mining subsidies
4. Research and planning
5. Service direction

D. Transportation and Communications Services

1. Transportation (other than motor equipment)
2. Motor equipment
3. Communications
4. Public utilities
5. Service direction

E. Records Service

1. Management
2. Archival services
3. Federal Register
4. Service direction

F. Agency Direction and Support Services

1. Executive direction
2. Administrative operations
3. Printing and duplication
4. Allowances and services to former Presidents

National Aeronautics and Space Administration**A. Extension of Manned Space Flight Capability**

1. Apollo

- 2. Applicable portion of AAP
- 3. Support costs
- B. Lunar Exploration
 - 1. Manned and unmanned lunar exploration missions
 - 2. Ground based research
 - 3. Support costs
- C. Planetary Exploration
 - 1. Unmanned and manned planetary missions
 - 2. Ground based research
 - 3. Support costs
- D. Astronomy
 - 1. Manned and unmanned flight missions
 - 2. Ground based research
 - 3. Support costs
- E. Other Scientific Investigations in Space
 - 1. Manned and unmanned flight missions
 - 2. Ground based research
 - 3. Support costs
- F. Development of Economic Applications
 - 1. Manned and unmanned applications missions
 - 2. Ground based research
 - 3. Support costs
- G. Space Technology
 - 1. Advanced research and technology projects
 - 2. Support costs
- H. Aircraft Technology
- I. Supporting Activities
 - 1. Tracking and data acquisition
 - 2. Sustaining university program
 - 3. Technology utilization
 - 4. General support

Veterans' Administration

- A. Compensation for Service-Connected Disabilities and Death
 - 1. Compensation for Veterans disabilities
 - 2. Compensation to survivors
 - 3. Miscellaneous
 - 4. Support
- B. Alleviation of Financial Needs of Veterans and Survivors not Connected with Military Service
 - 1. Veterans pensions
 - 2. Survivors pensions
 - 3. Miscellaneous
 - 4. Support
- C. Educational and Training Assistance
 - 1. Readjustment assistance
 - 2. Rehabilitative training of disabled Veterans
 - 3. Educational assistance to children of deceased and disabled Veterans
 - 4. Support
- D. Housing and Other Credit Assistance
 - 1. G.I. loans
 - 2. Direct loans

- 3. Activities in support of loan programs
- 4. Support
- E. Insurance
 - 1. Life insurance
 - 2. Death payments
 - 3. Miscellaneous
 - 4. Support
- F. Health Services
 - 1. Medical care
 - 2. Medical research
 - 3. Construction
 - 4. Support
- G. General Direction and Support (all not allocated to other categories)

National Science Foundation

- A. Support of Scientific Research
 - 1. Astronomy
 - 2. Atmospheric sciences
 - 3. Biology
 - 4. Chemistry
 - 5. Earth sciences
 - 6. Engineering
 - 7. Mathematics
 - 8. Oceanography
 - 9. Physics
 - 10. Social sciences
- B. Science Education Support
 - 1. Pre-college education
 - 2. Undergraduate education
 - 3. Graduate education
- C. Institutional Support for Science
 - 1. Institutional science improvement Programs
 - 2. Programs for maintaining institutional strength in science
- D. National Sea Grant Program
- E. Planning and Policy Studies
- F. Science Information Activities
- G. International Information Exchanges
- H. Program Development and Management

United States Information Agency

- A. Africa
 - 1. Radio activities
 - 2. Motion picture and television
 - 3. Press and publications
 - 4. Centers and English-teaching
 - 5. Exhibits
 - 6. Books
 - 7. Exchanges
 - 8. Personal contacts
 - 9. Research
 - 10. General Support

- B. West Europe
 - 1. Radio activities
 - 2. Motion picture and television
 - 3. Press and publications
 - 4. Centers and English-teaching
 - 5. Exhibits
 - 6. Books
 - 7. Exchanges
 - 8. Personal contacts
 - 9. Research
 - 10. General Support
- C. Far East
 - 1. Radio activities
 - 2. Motion picture and television
 - 3. Press and publications
 - 4. Centers and English-teaching
 - 5. Exhibits
 - 6. Books
 - 7. Exchanges
 - 8. Personal contacts
 - 9. Research
 - 10. General support
- D. Latin America
 - 1. Radio activities
 - 2. Motion picture and television
 - 3. Press and publications
 - 4. Centers and English-teaching
 - 5. Exhibits
 - 6. Books
 - 7. Exchanges
 - 8. Personal contacts
 - 9. Research
 - 10. General support
- E. Near East and South Asia
 - 1. Radio activities
 - 2. Motion picture and television
 - 3. Press and publications
 - 4. Centers and English-teaching
 - 5. Exhibits
 - 6. Books
 - 7. Exchanges
 - 8. Personal contacts
 - 9. Research
 - 10. General support
- F. Soviet and East Europe
 - 1. Radio activities
 - 2. Motion picture and television
 - 3. Press and publications
 - 4. Centers and English-teaching
 - 5. Exhibits
 - 6. Books
 - 7. Exchanges
 - 8. Personal contacts
 - 9. Research
 - 10. General support

C. World-Wide

1. Radio activities
2. Motion picture and television
3. Press and publications
4. Centers and English-teaching
5. Exhibits
6. Books
7. Exchanges
8. Personal contacts
9. Research
10. General support



PLANNING-PROGRAMMING-BUDGETING

BUDGET BUREAU GUIDELINES OF 1968

SUBMITTED BY THE
SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS
(Pursuant to S. Res. 212, 90th Cong.)
TO THE
COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE



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FOREWORD

The annual Bureau of the Budget guidelines for the planning-programming-budgeting system (PPBS) constitute the key instructions in the PPB process, and, from year to year, reflect the changes and developments in that process. The guidelines have therefore been of special interest to our subcommittee from the start of its study on planning-programming-budgeting in the national security area.

On April 12, 1968, the Bureau issued its revised PPB guidelines to the heads of Executive agencies. In this connection, we asked Charles J. Zwick, Director, Bureau of the Budget, to provide us with his explanation of the main differences between present and past PPB instructions, and to comment on the status of PPB in the field of foreign affairs.

The purpose of this publication is to make available in convenient form the text of the revised guidelines and of Mr. Zwick's commentary.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

MAY 20, 1968.

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[Bulletin No. 68-9, Executive Office of the President, Bureau of the Budget]

**BUREAU OF THE BUDGET BULLETIN TO THE HEADS
OF EXECUTIVE DEPARTMENTS AND ESTABLISH-
MENTS: PLANNING-PROGRAMMING-BUDGETING (PPB)
SYSTEM, APRIL 12, 1968**

1. *Purpose and scope.*—This Bulletin contains guidelines for continued development of integrated Planning-Programming-Budgeting (PPB) systems and outlines requirements for PPB submissions to the Bureau. This Bulletin supersedes Bulletin No. 68-2, dated July 18, 1967. Bureau of the Budget Circular No. A-11 is being revised to be consistent with these instructions.

This Bulletin applies to the agencies listed in section 1 of Attachment A. Other agencies (listed in section 2) will be contacted by the Bureau with respect to the extent of required compliance to the guidance provided in this Bulletin.

Attachment B provides guidance on the preparation of Program and Financial Plans (PFP's). This guidance has been developed as a step toward making the PFP a more useful tool for planning. The use of this guidance is not required of all agencies this year. It will be used this year with a few selected agencies which agree to make a pilot application to test and refine the concepts involved. While only a few agencies are involved in the pilot effort, other agencies are encouraged to use Attachment B guidance this year. (See paragraph 7a.) Bureau staff will be available to advise on application of this guidance.

The principal objective of PPB is to improve the basis for major program decisions in the operating agencies and in the Executive Office of the President. This requires clear statements of alternatives and of the reasons for decisions. Program objectives are to be identified and alternative methods of meeting them are to be subjected to systematic comparison. Data are to be organized on the basis of programs, and are to reflect the future as well as current implications of decisions. As in the case of budgeting, planning and programming apply not only to current programs but to proposals involving new legislation.

The budget is the financial expression of the underlying program plan. Review by the Bureau is conducted primarily in program terms. It is essential that the products of the PPB system—the Program Memoranda, Special Analytic Studies, and Program and Financial Plans (each defined in paragraph 2)—provide adequate bases for program decisions. Since the budget is transmitted to the Congress in terms of individual appropriations, there must be a clear relationship of program decisions to appropriation requests.

2. *Elements of the system.*—The PPB system provides for identification of program issues and consideration of such issues in the framework of a program structure. The system has three basic elements: Program Memoranda, Special Analytic Studies, and Program and Financial Plans.

a. *Program Memoranda (PM's)*.—A PM presents a statement of the program issues, a comparison of the cost and effectiveness of alternatives for resolving those issues in relation to objectives, the agency head's recommendations on programs to be carried out, and the reasons for those decisions. PM's, therefore, provide the documentation for the strategic decisions recommended for the budget year.

b. *Special Analytic Studies (SAS's)*.—The Special Analytic Studies provide the analytic groundwork for the decisions reflected in the PM's. Studies are of two types, both of which are essential to effective operation of an agency PPB system and to annual budget review.

Some SAS's will be performed in order to better resolve an issue in the budget year. These studies will be initiated and completed during the year and their results will be shown in the PM submitted in support of the budget request.

The second type involves studies which continue beyond the budget year. A continuing study will develop on a longer-run basis the conceptual understanding necessary to improve the data available, to evaluate the implications of agency objectives, and to provide an analytic basis for deciding future Major Program Issues (see paragraph 3).

c. *Program and Financial Plans (PFP's)*.—The PFP is a comprehensive multi-year summary of agency programs in terms of their outputs, costs, and financing needs over a planning period covering the budget year and four future years, or a longer period if this is appropriate to agency programs. While PM's deal primarily with the resolution of specified program issues, PFP's provide a continuing record from year to year of the outputs, costs, and financing of all agency programs. Thus the PFP is the basic planning document of the agency PPB system.

To meet Bureau needs, agency PFP submissions are to present specified data on outputs, costs, and financing over a seven-year period: the past, current and budget years, and four future years. Since PM's submitted to the Bureau of the Budget present agency recommendations only on Major Program Issues, the PFP serves as the vehicle for summarizing all program recommendations for budget review.

In addition to the material outlined above, the Bureau will continue to request, at staff level, such additional information as is necessary to better understand agency programs, PM's, Special Analytic Studies, PFP's, and budget submissions.

3. *Major Program Issues (MPI's)*.—A Major Program Issue is a question requiring decision in the current budget cycle, with major implications in terms of either present or future costs, the direction of a program or group of programs, or a policy choice. The most important feature of the statement of a Major Program Issue is the identification of specific alternative courses of action, and the costs and benefits of each. Pertinent legislative as well as budgetary considerations should be highlighted.

4. *Program structure*.—The program structure should group agency activities in a way that facilitates comparisons of the cost and effectiveness of alternative approaches to agency objectives. To serve this purpose, program classifications should be objective-oriented, grouping activities with common objectives or common outputs. Each agency is

responsible for its own program structure, subject to Bureau review. Continuing agency review of the program structure is required, with modification as necessary to meet changing conditions. The Bureau should be consulted on structural problems and proposed changes.

Normally, an agency program structure will include three levels of classifications: program categories, program subcategories and program elements. These should be established in accordance with the following general criteria.

a. *Program categories.*—The categories in a program structure should provide a suitable framework for considering and resolving major questions of mission and scale of operations which are a proper subject for decision at the higher levels of management—within the agency and within the Executive Office of the President. An agency generally should have between five and ten program categories.

b. *Program subcategories.*—Subcategories should provide a meaningful substantive breakdown of program categories, and should group program elements producing outputs which have a high degree of similarity.

c. *Program elements.*—A program element covers agency activities related directly to the production of a discrete agency output, or group of related outputs. Agency activities which contribute directly to the output should be included in the program element, even though they may be conducted within different organizations, or financed from different appropriations. Thus, program elements are the basic units of the program structure.

Program elements have these characteristics: (1) they should produce clearly-definable outputs, which are quantified wherever possible; (2) wherever feasible, the output of a program element should be an agency end-product—not an intermediate product that supports another element; and (3) the inputs of a program element should vary with changes in the level of output, but not necessarily proportionally.

d. *Treatment of support and indirect activities.*—In dealing with the costs of support and indirect activities, arbitrary allocations which are made solely for the purpose of distributing all costs should be avoided. Allocations should be made only where they contribute to better decisions.

When supervisory and support operations (such as comptroller, personnel and administrative service operations) are completely involved in a single program element, they should be reflected in that element.

In many situations, however, such operations may support two or more program elements. In such cases, the costs of the supervisory or support activities should be distributed to each supported program element—if there is a reasonable basis for doing so, and if those costs may be expected to vary reasonably in line with trends in each of the program elements involved.

Where there is no reasonable basis for allocating such activities, or where allocation would not contribute to more effective decision-making in budget review, these activities should be reflected in appropriate separate classifications within the program structure.

e. *Adaptation of program structure to decision-making needs.*—There are many instances where the program structure, if it is to facilitate

decision-making, must cut across organization lines, appropriations, and other classifications. Pursuit of absolute uniformity and consistency in development of a program structure will, however, be counter-productive in some instances in terms of the major objective of PPB: the improvement of the basis for decision-making.

For example, there are cases where a specific target group is an important focus of decision-making, while the services provided to the group would normally fall within several different classifications of the program structure. This would apply, for example, to a group of refugees who are furnished health, education, and other services, but where decisions in the Executive Branch are in fact made in terms of this group of refugees as a whole. In such a case, all activities concerning the group should be reflected in one unique program element within the subcategory and category predominantly involved, unless this would produce significant distortions in the basis for decision-making in the other parts of the program structure.

A second example involves certain overhead and support activities or administrative expense items, which may be technically allocable among various program elements under guidelines furnished above. In some instances, these costs are large collectively but, distributed among many program elements, are not a significant factor in decisions regarding those program elements. Where this is true, and where decision-makers in the Executive Branch must focus at some point upon the costs in total, it is better to segregate them within the program structure, rather than allocating them.

As a third example, excessive fragmentation of appropriations and organizations should be avoided. For example, if about 80 percent of an appropriation or the costs of an organization would fall within one part of the program structure, the entire amount should be so allocated unless this would cause significant distortions in the basis for analysis and decision-making. Further, there is usually little to be gained by spreading very small appropriations or small parts of an appropriation within the program structure. Normally, they should be allocated in total to that element into which the costs predominantly fall.

Agencies should review their structure in light of these criteria. In addition, Bureau representatives will advise individual agencies of a number of specific instances where the program structure should be modified in accordance with the foregoing.

f. *Relationship to other classifications.*—As part of its effort in the review of program structures in individual agencies, the Bureau will continue to work toward development of a Government-wide program structure. As this effort progresses, agencies will be asked to adjust their structures to produce a comprehensive and compatible pattern across agency lines.

To facilitate the translation of program decisions and related data into the classifications used in the budget, it is desirable to bring program and appropriation structures into as close a relationship as possible. In refinement of the PPB system, the aim is to interrelate, to the maximum extent, the functional classification employed in the budget, the agency program structures, and the appropriation activity classifications in the budget. Attention should be given to changes in structures which will contribute to this objective.

5. *The Program Memoranda (PM's).*—PM's are oriented to Major Program Issues. They may cover all or only a part of a program

category, or cut across several program categories. Where a category is not involved in a Major Program Issue, the category will not be covered by a PM. Thus, PM's will not necessarily cover the agency's entire program.

For internal purposes, and to provide for the September 30 budget submission to the Bureau, agencies should develop and maintain narrative and tabular material outlining the strategy and assumptions underlying the projections in the PFP for each program category. These category summaries will make reference to PM's as appropriate. Specific instructions regarding Bureau requirements are included in Circular No. A-11.

a. *Content of the PM.*—The PM shows what choices the agency head has made, includes the major program recommendations of the agency for the upcoming budget, and defines authoritatively the strategy underlying those program recommendations. In addition to identifying the strategy upon which agency plans are built, the PM should show how the resolution of Major Program Issues fits into or modifies the program strategy. This integration of the objectives of the agency program with specific decisions made on program issues for the budget year is one of the principal functions of the PM.

The PM also shows why particular choices have been made, by identifying agency objectives in a measurable way, and comparing alternative programs in terms of their costs and who pays them, and their benefits and the group benefitted. The PM should deal explicitly with the legislative implications of the alternatives presented, and should summarize the analytic basis for choice among those alternatives. The supporting analyses may be contained in separate appendices to the PM. Where Special Analytic Studies cover the detailed analysis, and have been made available, a PM need only summarize the findings and make reference to the studies.

The PM's provide internal guidance for preparation of the agency budget submissions, and a basis for major program decisions in budget review. Therefore it is essential that the choices among alternatives be recorded in the PM's and that the reasons for the choices be stated. Where Special Analytic Studies have not been made, the PM will indicate whatever basis exists for choice among the alternatives.

A PM should be no longer than 20 pages, and should be so prepared that it can readily be used by the agency head and the Director of the Bureau of the Budget.

b. *Submission requirements.*—Each agency will receive from the Bureau an issue letter requesting Special Analytic Studies and identifying the Major Program Issues to be covered by PM's for the upcoming budget cycle. Agencies may suggest additional issues and submit related PM's if they will contribute to more effective review of budget requests.

In response to the issue letter, draft PM's will be submitted in accordance with a schedule developed with the Bureau. The draft PM's will permit review by the Bureau of the statements of the Major Program Issues which the agency will address, and the analytical material and methods being employed. Draft PM's are *not* commitments on the part of the agency to program decisions.

Final versions of each PM (and Special Analytic Studies addressed to budget year problems) are to be submitted on September 30 with

the agency's budget submission. These final PM's should indicate the recommendation of the agency head on all identified Major Program Issues.

PM's are required to be submitted to the Bureau only in connection with Major Program Issues, as outlined above. Agencies are encouraged to develop PM's in connection with other issues; submission of these additional PM's to the Bureau will be welcomed.

6. *Special Analytic Studies (SAS's)*.—Special Analytic Studies provide agency heads and the Bureau with information for making decisions among alternative ways of achieving program objectives. There is no established format nor length for these studies—these will vary with the subject matter involved. Normally, a Special Analytic Study should be conducted for each Major Program Issue. However, staff shortages, the lack of data or of conceptual bases for analysis, and other circumstances may in some cases make it impossible to provide a Special Analytic Study for each PM.

Usually a study is not coextensive with a program category. Dealing with a specific Major Program Issue, a study may cover a specific aspect of a program category, or may cut across program category lines. As soon as practicable after receipt of the issue letter, agencies should notify the Bureau of studies under way and planned. If these plans change significantly, the Bureau should be advised.

7. *Program and Financial Plans (PFP's)*.—The PFP covers data relating to the outputs, costs and financing of all agency programs. The PFP should reflect the future implications of current and past program decisions of the agency head and, subsequently, of the President. The outputs, costs and financing of agency programs are to be shown in the PFP for each program element, grouped in terms of the program structure by category and subcategory, and for each of the seven years covered by the PFP.

The years beyond the budget year are included to show the future implications of past and current decisions. This projection, therefore, is not intended to be a prediction of the future budget totals for the agency or for major programs. It is intended to be a reflection of the level to which existing decisions have committed the Federal Government.

The PFP shows, on the output side, the expected benefits of multi-year projections and, on the cost side, the future financial requirements that are the result of the accumulation of program decisions made for the budget year or in past years.

Agency systems will include procedures for preparing and updating PFP's in a way which is suited to the agency's programs and which satisfy requirements of this Bulletin.

a. *Scope and content of PFP*.—The PFP covers the total operations of the agency. Data should not be excluded because certain operations are not specifically covered by the existing program structure, or because the PPB system has not yet been extended to those operations. Data for such operations should be shown on a separate line of the PFP.

As a general rule, agencies will prepare PFP's on the same basis as for the 1969 budget. However, Attachment B provides new guidance with respect to the preparation of PFP's. For the 1970 budget, this guidance will be used on a pilot or test basis by selected agencies, for which separate arrangements will be made by the Bureau. It is planned to make this guidance mandatory for all agencies next year, subject

to whatever modifications are suggested by experience with the pilot applications this year. Other agencies are encouraged to review the guidance carefully; apply it for the 1970 budget to the extent they find it practicable; advise the Bureau of any problems; and make plans for application of the guidance next year.

b. *Submission requirements.* Specific tabulations to be used within an agency should be developed as appropriate for the programs of the agency. For submission to the Bureau, the following are required:

(1) Table I.—Outputs and costs by program element (agency formats are acceptable).

(2) Table II.—Costs by program category and subcategory, and, for the budget year, budget authority by program category and subcategory.

(3) Table III.—A translation of financial requirements from the program structure to agency appropriations. (See Circular No. A-11 for format and instructions.)

A PFP will be submitted to the Bureau twice each year: on September 30, with the agency's budget submission to the Bureau, and not later than February 15, updated for all years to reflect the decisions reached in the budget. The initial submission will reflect the agency request for the budget year and, for the four future years, the cost of carrying out the programs to which the Government would be committed under those recommendations. The February 15 submission will reflect for the budget and future years the costs of carrying out the programs to which the Government is committed by decisions reflected in the budget. The PFP required for submission to the Bureau is not intended as a projection of requirements as foreseen by the agency over the planning period.

c. *Relationship to PM's and SAS's.*—This constraint upon the data to be reflected in the future years of the PFP submission to the Bureau does not apply to PM's and Special Analytic Studies. These are decision-making documents which require full consideration of all relevant outputs, costs, and financing needs over the planning period used by the agency, and comprehensive examination of the benefits and costs of alternative approaches to resolving the issues. Such analysis requires an evaluation of the total scope of a proposed program and its anticipated benefits, and consideration of such factors as systems costs, marginal costs, and economic opportunity costs.

8. *Timing and submission of PPB documents.*—PPB is a continuous process. Analytic work cannot produce once-and-for-all answers, nor can periodic planning and programming efforts produce a systematic and effective decision-making process. On the other hand, successive analyses within the framework of an integrated PPB system which operates as part of the total management complex of the agency, can assist in producing successively better Government decisions and in responding to new initiatives and changing circumstances. The decisions to which PPB contributes are basically incorporated in two annual processes—the budget and the legislative program of the President. It is necessary that the preparation and presentation of PPB documents fit the schedules for these two processes. The timing of PPB submissions and the actions involved in each time frame are outlined below.

a. *Illustrative annual cycle for PPB submissions.*—The agency PPB system and related internal procedures should be geared to the following schedule:

In first quarter of calendar year: Bureau sends letters to agencies identifying Major Program Issues for which PM's are required and suggested Special Analytic Studies.

Agency provides Bureau with list of SAS's underway and planned.

February 15 through July 15: Agencies submit by February 15 *PFP updated* to reflect programs in President's Budget.

Agencies begin submission of *draft PM's* on a staggered schedule agreed upon by the Bureau and the agency.

March through August: Bureau works closely with agency staff who are preparing required PM's and SAS's, and reviews those documents for adequacy as a final submission.

July–September: Agency head makes final decision on his program recommendations.

Agency completes final PM's and related SAS's and revises PFP's—adding one year and making the PFP conform to agency head's decisions.

Bureau responds to agencies on draft PM's submitted in response to issue letter.

September 30: Agency submits final PM's, SAS's, as required, PFP, the annual budget, and the annual legislative program to the Bureau.

October–December: Bureau reviews agency submissions and recommends to the President; Presidential decisions made and communicated to agency.

January: President's budget is transmitted to the Congress.

Agency updates PFP to conform to that budget, for February 15 submission to the Bureau.

b. *Copies required.*—Six copies of PM's, SAS's and PFP's should be submitted to the Bureau. Bureau staff may request additional copies.

9. *Responsibility, staffing and training.*—Responsibility for the development and use of PPB systems rests with the head of each agency. Agency heads are requested to take such action as is necessary to insure that line managers participate in operation of the PPB system, and that they have available sufficient resources to insure participation in the development of PM's, SAS's, and PFP's.

Agencies will be called on to provide pertinent data on the results of resource allocation decisions made under PPB. The accounting system(s) of the agency should provide adequate support for the information utilized in operation of the PPB systems. Where the maintenance of specific accounts for program classifications is not justified as an efficient and practical approach, information for the past year may be developed through cost allocation or analysis techniques. In such cases there should be a technical note appended to the PFP to indicate the techniques used. Cost distribution practices should furnish a suitable basis for program decisions and provide managers concerned with reliable information.

Agency reporting systems should provide timely data on outputs and costs in budget execution, so that programs may be effectively carried out according to approved plans and related operating budgets. Such systems should be designed to provide data suited to the needs

of managers at each level, and to furnish information useful for planning and programming in the next cycle of operations.

To make PPB a fully effective system, a general understanding of the methods and purposes of PPB must be generated throughout the agencies. Agencies are encouraged, therefore, both to make use of the various training and educational programs offered through the Civil Service Commission, and to establish internal orientation and training courses as appropriate.

CHARLES J. ZWICK,
Director.

Attachments.

ATTACHMENT A

BULLETIN No. 68-9

Agencies to Which this Bulletin Applies

Section 1:

Department of Agriculture
 Department of Commerce
 Department of Defense—separate submission for:
 Military functions (including civil defense and military assistance)
 Corps of Engineers, civil functions
 Department of Health, Education, and Welfare
 Department of Housing and Urban Development
 Department of the Interior
 Department of Justice
 Department of Labor
 Post Office Department
 Department of State (excluding Agency for International Development)
 Department of Transportation
 Department of the Treasury
 Agency for International Development
 Atomic Energy Commission
 Central Intelligence Agency
 General Services Administration
 National Aeronautics and Space Administration
 National Science Foundation
 Office of Economic Opportunity
 Peace Corps
 United States Information Agency
 Veterans Administration

Section 2:

Civil Service Commission
 Federal Communications Commission
 Federal Home Loan Bank Board
 Federal Power Commission
 Federal Trade Commission
 Railroad Retirement Board
 Securities and Exchange Commission
 Small Business Administration
 Tennessee Valley Authority

ATTACHMENT B

BULLETIN No. 68-9

PFP Guidance

The tables that comprise the Program and Financial Plan (PFP) include data on outputs, costs and their financing. This attachment presents guidance on the concepts to be applied in preparing the PFP. For the 1970 budget, this guidance is not mandatory for all agencies, but will apply in all respects to selected agencies which will be notified by the Bureau (see paragraphs 1 and 7a of the Bulletin). It is planned to apply this guidance to all agencies next year, subject to modifications suggested by the pilot applications. All agencies are encouraged to review this guidance carefully; apply it for the 1970 budget to the extent practicable; and make plans for mandatory application of the guidance next year.

1. *Concept of outputs.*—Table I of the PFP submission is to display outputs, i.e., a quantitative measure of the end products or services produced by a program element. The types of outputs to be reflected in the PFP may differ from those to be considered in the PM's and Special Analytic Studies. The PFP is intended to reflect, for decisions reached, the outputs in relatively unambiguous terms. Outputs in these terms might include the number of B-52 squadrons, number of workers trained, etc. Such measures are useful for internal agency programming, although they do not measure the benefits of the program or progress against agency objectives.

PM's and Special Analytic Studies should reflect, for a given program element, a much broader concept of the benefits produced by the element. For example, PM's and Studies might consider ordnance on target for B-52 squadrons, or the impact of a training program upon worker earnings—thus facilitating the comparison of either with other elements that produce similar benefits. Normally, however, there will be differences in output mixes, and special qualifications or breakouts required, which will make it difficult to express such measures in unambiguous terms in the PFP. In short, the PFP will normally reflect the outputs associated with decisions reached. An appreciation of the reasons for the decisions, and the relevant cost-benefits comparisons, will normally require recourse to PM's and studies.

However, if meaningful measures of achievement and effectiveness for a program are available, they should be displayed in the PFP, either on a separate line in Table I, properly identified, or by means of a supplementary table. In certain cases, such as research programs, where benefits are difficult to define, the best available quantitative nonfinancial descriptions of the program should be used.

In some cases—a recreation program, for example—costs in the PFP may best be related to the capacity of proposed recreation facilities, and this might serve as the best output measure. Attainment of the objective of the program, however, may best be shown by a measure of the use of the facilities—which is an important factor for decision-making. Both of these measures, therefore, are relevant and appropriate for presentation.

Agencies should strengthen their efforts to produce more suitable program measures—particularly measures of program benefits, and measures that show the achievement of objectives. These are of prime importance for analysis and for making informed program decisions.

2. *Concept of costs—the “program level”*.—The financial information to be shown in Tables I and II of the PFP submission is to reflect the program level for each year in the respective classifications. In most cases, the best financial measure of program level will be budget authority. This includes, for example, lending authority for many loan programs; and new obligating authority for most operating programs, some construction projects, grant programs, and research activities—wherever such data are the most suitable indicator of the level of effort contemplated for the program.

There are a number of cases, however, where budget authority is not a good measure of program level because of the type of program and the nature of financing. In such cases, other measures should be used as appropriate, and they should be identified in the stub column of the PFP. Some examples include:

a. For construction and other projects financed on an incremental basis, the program level *for the budget year* should reflect the full amount to which the Government will in fact be committed for projects for which approval is requested in that year. For example, if a project will ultimately cost \$200 million, and if the first year budget authority would be \$40 million, the PFP should show for the budget year:

(1) A program level of \$40 million if, as a practical matter, the project could be stopped at that point.

(2) A program level of \$200 million if, as a practical matter, the project would have to be completed once begun.

(3) A program level between \$40 million and \$200 million if there is an interim stopping point.

b. In many trust funds, budget authority represents appropriated receipts—which are not a good measure of the level of activity because not all receipts will be used under the planned program. In these cases budget outlays differ markedly from budget authority and should be used to show the program level.

c. In some loan and grant programs, available funds are reserved upon approval of an application. These reflect the program level better than budget authority and should be used in the PFP.

d. In some cases, the budget authority provided for a given year does not provide a good measure of program level for that year because of the application of unused balances from other fiscal years. For example, an agency may propose a \$50 million project to be financed from an unused prior-year appropriation, without use of any authority provided in the budget year. In such a case, the PFP should reflect a program level of \$50 million. If, in this situation, the project was estimated at a \$75 million total cost, with \$25 million drawn from authority requested in the budget year, the PFP should show a \$75 million program level in the budget year.

e. Another exception involves loan collections, sale of assets, and similar transactions—the proceeds of which are used to finance programs in lieu of budget authority. In the budget, these collections are sometimes applied at the appropriation or agency level, and sometimes as department-wide deductions. An example of the former is the sale

of equipment to another government or agency, where the proceeds are credited to the appropriation which originally financed the acquisition of the equipment. In some loan programs, loan collections are offset against budget authority. Regardless of how they are treated in the budget, such transactions should not be netted from the program level for program elements in the PFP.

f. Some agencies, such as Post Office, parts of GSA, and certain support organizations in the Department of Defense, exist almost entirely to provide services for other agencies or the public, for which the performing agencies are paid. In cases such as these, the program classifications of the performing agency should reflect gross program levels, receipts earned, and net program levels. Agencies which levy user charges or realize proprietary receipts which are creditable against budget authority may follow this practice if the program level is in fact substantially determined by the volume of such charges or receipts.

Reimbursable work in general (e.g., provision of ADP services to another agency) may be treated in the manner just outlined or, at the agency's option, excluded from the PFP.

In cases where a program is financed by the Federal Government and others, the total program level for the element involved may be shown. If this is done, the non-Federal financing should be shown as a deduction at this point, so that the PFP will show the program level which the Federal Government is committed to finance.

The total program levels for the agency are to be reconciled, at the bottom of Tables I and II of the PFP, to total budget authority for each year shown in the PFP. Total budget authority for the past year, current year, and budget year must agree with the three columns shown in the budget schedules. Bureau staff are available to assist in this reconciliation effort, and in identifying the most suitable measure of program level to be used for individual programs.

3. *Concept of controllability—the "commitment classification".*—To improve the usefulness of financial information in the PFP for budgetary and planning purposes, a commitment classification is to be employed in Table II of the agency PFP submission. This classification will group financial data for programs according to the degree of control that can be exercised by the Executive Branch in the allocation of resources in the budget and future years (see illustrative table).

Program information should be based upon existing legislation, plus specific legislative proposals put forward by the President. Where activities are subject to annual legislative authorization, the data in the PFP may assume that such authorization will continue to be secured, in the form last approved by the President. Where programs have been authorized for a number of years, with the terminal date falling in the forecast period, renewal may be anticipated but this fact should be appropriately noted in Tables I and II.

The commitment classifications to be reflected in Table II of the PFP (illustrated at the end of this attachment) are defined in the following paragraphs.

a. *Programs controlled by statutory formulae (Class 1).*—This classification brings together all programs where the recipients and the amount to be provided are specified in law. Examples include veterans' compensation and the social security trust funds. Program levels in future years will be based on projections of numbers of beneficiaries

and other relevant factors. Programs should be placed in this classification only in clear cases where the budget provides for a specific or formula-related payment to all qualified recipients. Where the level of appropriation is in fact controlling, the program should be shown in Class 6.

b. *Programs controlled by workload level (Class 2).*—This classification includes all programs where the work must be performed to meet specified needs, and the volume of the work in fact sets the requirements, as in the case of postal service. Program levels for future years will be based upon projections of workload and productivity changes. The use of this classification should be restricted to clear cases where the budget provides for a given quality of service to all qualified recipients. Where the level of appropriation is in fact controlling, the program should be shown in Class 6.

c. *Market-oriented programs (Class 3).*—This classification includes programs in which the Government is committed to respond to market conditions. Generally, these are financed by permanent budget authority. The major examples include interest on the public debt and agricultural price supports. The PFP will be accompanied by explanatory material indicating the key assumptions involved in the future-year projections and the probable range of estimates applicable to each year.

d. *New programs requiring legislation (Class 4).*—This classification will group all new programs covered in the budget-year legislative program. Budget-year program levels will, as in other cases, be consistent with the budget. Future-year projections will be based upon the instructions for the commitment classification in which the program would otherwise belong: statutory formula, etc. If the program is of the type that will be controlled by the level of appropriations (see Class 6), equal amounts will be projected for each of the four future years, based upon the operating rate that will have been attained by the end of the budget year.

e. *Administration commitments (Class 5).*—This classification will include programs to which the President has publicly and specifically committed the administration to changes, either for the budget year or future years. Future-year projections will be based upon this commitment. This should not include budget-year legislative proposals (Class 4).

f. *Programs controlled by the level of appropriations (Class 6).*—This classification is to group all programs where the program level is in fact controlled by the level of appropriations. This involves cases, for example, where the amount of grants that could be paid to recipients under accepted standards exceed the amount available in the budget. Most grants, foreign assistance, and construction programs, and many research, service and lending programs are in this class. In all these cases, the programs will be projected in the PFP on a flat or declining trend, in accordance with the specific guidelines which follow, even though increases are projected in population supported or in other indices of program need. This classification will be subdivided into two parts.

(1) *Construction and acquisition of major capital items (Class 6a).*—This will cover construction, the acquisition or improvement of real property, public works activities, and a significant change in capabili-

ties or mode of operations which involves equipment of a high cost. In general, equipment to be reflected here should involve a 5-year cost of \$5 million or more for a given item, or closely-related family of items. Major proposals for modernization or mechanization should be included here, even though they involve support of programs otherwise included in the first three classes. Class 6a is *not* intended to include all equipment which may be reflected as capital items for accounting purposes—for example, office equipment and furniture, commercial vehicles, and similar items acquired to support ongoing operations will normally be excluded.

The budget year program level for these capital items should reflect the full costs to which the Government would be committed if the proposal was approved, including costs that might be financed from subsequent year budget authority (see paragraph 2a). The program level for such items beyond the budget year should be zero.

(2) *Ongoing costs (Class 6b)*.—This will cover ongoing costs and minor capital items for programs controlled by the level of appropriations. No increases will be shown beyond the budget year, but decreases will be shown where appropriate. Decreases would be appropriate, for example, where the legal basis will change during the forecast period; where a part of the basis for the program will disappear, as in the case of declining food surpluses; or where pilot or demonstration projects or improvement efforts will run their course.

The purpose of this commitment classification is to enhance the usefulness of the PFP as a tool in planning and decision-making, including the provision of meaningful agency-wide and Government-wide aggregates. It is not intended to be precise and accurate to the last detail. The PFP submission will include a summary of each agency's program level by commitment classes as illustrated in the accompanying table.

4. *Guidelines for projections*.—Budget-year estimates in the PPB submissions will in all cases be consistent with the budget submission, for which guidance is provided in Bureau Circular No. A-11. The guidelines which follow relate to future-year projections.

a. *General price levels and Federal pay rates*.—With respect to the direct Federal purchase of goods and services and employment, general price levels and pay rates should be projected for future years at the same levels as are used in the budget year.

b. *Price levels and economic assumptions applicable to specific programs*.—A small number of Federal activities are heavily or totally dependent upon price and other movements in certain economic sectors. Examples include debt interest, agricultural price supports, and payments tied to the cost of medical services. In these cases, future-year projections should be based upon trends that are the most realistic in terms of the sector involved. The PFP estimate should be accompanied by explanatory material indicating the key assumptions involved in future-year projections, and the possible range of estimates applicable to each year.

c. *Transfer payments that are related by statute to an economic index.*—These types of payments should be projected on the basis of the changes in the pertinent index. Examples include payments to retired personnel that are automatically adjusted with movements in the consumer price index. The projection should be based on the assumption that the average annual change for the most recent five years will continue.

d. *Receipts.*—To the extent that agency receipts are a significant factor in developing the PFP data or in making projections, appropriate explanatory material should be submitted with the PFP. For example, in cases where the volume of trust fund outlays for an agency exceeds \$100 million annually, a projection of trust fund receipts should be included with the PFP submission. Such projection should also be prepared in any case where proprietary receipts exceed \$100 million annually.

Receipts from employment taxes should reflect changes in covered employment and average earnings. Tax rates should be those provided in existing law, or in any amendments proposed by the President.

The effect of price movements in specific sectors, as mentioned above, should also be reflected in receipt estimates.

Estimates for premiums received and similar items should be consistent with the program projections—if the program projection would imply an increase or decrease in premiums, this should be reflected even if statutory authority is required.

Receipt estimates based on postal and other rates fixed in law should be projected on the basis of existing law or amendments proposed by the President, recognizing projected workload changes. For those rates which can be altered administratively, receipts should be projected on a basis consistent with workload and cost projections.

User charges should be included where now authorized, or as proposed by the President. Where the legal basis for such charges, or other receipts, will expire during the forecast period, renewal should be assumed unless this would clearly be inconsistent with other assumptions in the PFP.

In all other cases where the PFP reflects changes in price indices and other economic assumptions, concise explanatory material should be included with the PFP. In addition, there should also be submitted with the PFP information bearing on any significant financial matters related to the programs shown in the basic tables. Examples include information on large unobligated balances and data on purchase and sale of non-Federal securities.

DEPARTMENT OF GOVERNMENT
PROGRAM LEVEL BY SUBCATEGORY

[In millions of dollars]

	1968 actual	1969 est.	1970 est.	1971 est.	1972 est.	1973 est.	1974 est.
1. Military applications:							
Intelligence.....	248	260	255	210	195	190	188
Communications.....	160	190	205	210	215	215	212
Total, military applications.....	408	450	460	420	410	405	400
2. Space applications:							
Propulsion.....	121	90	75	70	65	60	63
Navigation.....	91	111	114	84	96	105	108
Total, space applications.....	212	201	189	154	161	165	171
Total program level, Department of Government.....	620	651	649	574	571	570	571
Increase or decrease (—) in unobligated balance.....	174	—61	—26	26	—	10	—
Unobligated balance lapsing.....	5	3	—	—	—	—	—
Increase (—) or decrease in unobligated loan commitments.....	—5	—8	6	2	—	5	—
Budget year construction program to be financed from subsequent budget authority.....	XXX	XXX	—120	50	40	30	—
Current and prior years construction programs for which budget authority is necessary in future years.....	XXX	XXX	30	20	10	—	—
Loan collections.....	—20	—25	—28	—31	—31	—34	—35
Purchase or sale (—) of non-Federal securities.....	100	—50	—	—	—	—	—
Intragovernmental transactions.....	—5	—6	—8	—8	—9	—10	—10
Total budget authority, Department of Government.....	869	504	503	633	581	571	526
Program level by commitment class:							
1. Statutory formula.....	388	381	376	367	340	338	343
2. Workload level.....	48	51	55	59	62	63	64
3. Market-oriented programs.....	25	28	15	8	10	15	5
4. New programs requiring legislation.....	—	—	10	20	40	45	50
5. Administration commitments.....	—	—	5	10	10	—	—
6a. Level of appropriations: capital acquisitions.....	48	72	76	—	—	—	—
6b. Level of appropriations: ongoing.....	111	119	112	110	109	109	109
Total program level, Department of Government.....	620	651	649	574	571	570	571

COMMENTARY ON RECENT DEVELOPMENTS IN THE PLANNING, PROGRAMMING, AND BUDGETING SYSTEM

By Charles J. Zwick

(Director, Bureau of the Budget)

I. PRINCIPAL CHANGES IN PLANNING, PROGRAMMING AND BUDGETING (PPB) GUIDELINES

The purposes of the recently redrafted PPB Guidelines (BOB Bulletin 68-9, April 12, 1968) were to:

1. Permit agencies and the Bureau an opportunity to consolidate the progress made in developing and introducing the PPB System in the past two years.
2. Clarify aspects of earlier guidance (Bulletin 68-2, July 18, 1967) and to place greater emphasis on the need for analysis to support program decisions.
3. Encourage further integration of program and appropriation structure.
4. Initiate a test of five-year projection procedures to improve future guidelines in this area.

Considering each of the above separately:

1. CONSOLIDATE PROGRESS

The principal object of PPB has been and is to subject decisions about resource allocation to systematic analysis, comparing alternative courses of action in a framework of national objectives clearly and specifically stated. Since the inception of the system in the civilian agencies, much of the PPB effort has had to be invested in developing and adapting the procedures and organizational arrangements needed. As in any significant change in a management process, those most affected by the change need time to assimilate not only different ways of thinking about issues but also the new organizational units created and procedures used.

An important aim of Bulletin 68-9 is, therefore, to provide agencies the opportunity, during this year, to accommodate to these changes and to increase emphasis on the application of analysis to current issues. To do this we have made as few changes in procedures as possible.

2. CLARIFY EARLIER GUIDANCE

The principal clarification concerns the requirement to submit Program Memoranda to the Bureau of the Budget. Under Bulletin 68-9, the requirement is limited to program categories within which major program issues have been identified. This is to emphasize further the requirement stated in Bulletin 68-2 that the Program Memoranda are to be decision documents, focused on important issues that are stated in terms of the options among which choice is necessary, and

explaining the recommended choices in terms of comparisons among the alternatives. The comparisons are to be based on an exposition of the relevant national objectives and to draw upon the conclusions of relevant analytic studies. Detailed reports of analytic studies are to accompany the Program Memoranda.

We anticipate growth over time in the ability of the agencies to formulate and analyze major program issues. As this occurs, the PM's will become increasingly comprehensive and authoritative statements of program strategy for the program categories they cover. They are therefore a critically important element of the PPB System.

3. ENCOURAGE INTEGRATION OF PROGRAM AND APPROPRIATIONS STRUCTURE

Bulletin 68-9 reflects recognition that a "two-track system"—one geared to program analysis and a separate one to appropriations—may result in confusion and an undue burden of effort on both agency and Bureau staff now involved in working with similar data in both systems. In Bulletin 68-9 we have, therefore, asked that agencies consider changes in their program structures to assist in integrating program and appropriations structure, where such changes will not impair the usefulness of the program structure for analysis and program decisions.

A prime purpose of PPB is to bring to bear on specific program issues analyses of the cost and effectiveness of alternative ways of achieving national objectives. Our intention is that decisions on these issues will be reflected in specific budget decisions. To ease the process of incorporating decisions made in program terms into budget requests made in appropriation terms, agencies are asked to consider changes in appropriations and program structure and in internal organization and procedures through which greater integration of the two classification systems might be effected.

4. TEST OF PROJECTION PROCEDURES

Last year, the Program and Financial Plans, the multi-year planning element of the PPB process, in most cases presented agency views of the future costs of their programs based upon full funding of programs and assumptions about new program starts. While these forecasts have some uses for internal agency planning, future program levels will be responsive to a changing and uncertain environment and to *future* decisions, so that any single estimate will be unreliable. *Current* decisions, however, have relatively predictable future implications and, Bulletin 68-2 had asked that PFP projections of program costs reflect only those future costs to which we were committed by decisions taken to date. It was recognized at that time, however, that substantial additional work would be necessary to define what we meant by commitment, in sufficient detail to produce consistent, useful projections.

Attachment B of Bulletin 68-9 is the result of effort by the Budget Bureau to develop guidance on PFP preparation which more specifically defines commitment. Two factors bearing on the applicability of our instructions to agencies became apparent during the preparation of this guidance.

(1) A mandatory and universal change in the method for preparing PFPs—particularly the adoption of a new classification system—would have imposed a heavy burden on the process. This would have conflicted with our major objective of consolidating the progress made in program analysis over the past two years.

(2) A classification of commitments applicable to all PPB agencies and sufficiently simple to be useful, must be developed on a pragmatic basis, and will probably require some modification by trial and error.

Both factors argue against the promulgation of a requirement that all agencies adopt the scheme this year. We have, therefore, issued the new PFP guidance (Attachment B of BOB Bulletin 68-9) to be used by a few agencies which *elect* to follow the guidance. It is our intention to work closely with these agencies (none of whom are in the Foreign Affairs area) in order to produce good forecasts of commitment levels for those agencies. More important, we hope to learn enough about the variations in program activities, financing methods, and other factors to develop better guidelines for PFP projections next year. As BOB Bulletin 68-9 announces, those guidelines will then be mandatory for all agencies.

II. THE STATUS OF PPB IN THE FOREIGN AFFAIRS AREA

I have reviewed the testimony before your Subcommittee, last fall, by my predecessor, Charles Schultze, and I am in substantial agreement with the views he expressed on the role and prospects for PPB in the foreign affairs area.

It might be useful to the Subcommittee if I were to indicate the progress we are making on the two limited steps which he said the Budget Bureau and the State Department would jointly take on foreign affairs programming. Because of our concern for the complexities of the problems, we are moving forward pragmatically and deliberately.

First, we have systematically consulted with the State Department's Regional Assistant Secretaries on interagency program issues arising out of agency PPB submissions during our formal budget review last fall. We found the consultations useful in dealing with the issues, and we believe we have initiated a dialogue that can be continued in future cycles.

Second, we are developing on an experimental basis some interagency papers for individual countries, dealing with U.S. objectives and the resources of the major foreign affairs agencies devoted to achieving the objectives. We anticipate that we will want to continue this experimentation and learn from it.

In the case of the Latin American region, the State Department and the agencies are continuing to develop Country Analysis and Strategy Papers, drafted in the Embassies and reviewed by the Interdepartmental Regional Group in Washington. These Papers are providing guidance to the agencies and the Embassies as they develop their individual programs and budget requests.

PLANNING-PROGRAMMING-BUDGETING

SELECTED COMMENT

PREPARED BY THE
SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS
(Pursuant to S. Res. 54, 90th Cong.)
OF THE
COMMITTEE ON GOVERNMENT OPERATIONS
UNITED STATES SENATE



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FOREWORD

The Subcommittee on National Security and International Operations is inquiring into the Planning-Programming-Budgeting System (PPBS), applied in the Department of Defense starting in 1961, and projected for the other major federal departments and agencies in President Johnson's directive of August 25, 1965. Consistent with its jurisdiction, the focus of the subcommittee is on the operation of the system in the national security area.

The function of this publication is to provide in handy form for the subcommittee recent comment on program budgeting, systems analysis and cost-effectiveness studies—key features of PPB.

These papers include a variety of viewpoints which are presented to indicate problems and to stimulate questions. Opinions printed here do not, of course, necessarily reflect the views of subcommittee members.

We are grateful to the authors and publishers for their cooperation in giving permission to reprint these selections.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

JULY 26, 1967.

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[Presentation prepared for the Special Subcommittee on the Utilization of Scientific Manpower, Senate Labor and Public Welfare Committee, 89th Congress, 2d session, May 17, 1966]

THE SYSTEMS ANALYSIS APPROACH

By Alain C. Enthoven

(Assistant Secretary of Defense, Systems Analysis)

It is a great pleasure for me to appear before you this morning and to have the opportunity to make a contribution to the use of Systems Analysis on problems of State and local governments. I believe that this is a most worthwhile objective and that there are clear possibilities for making major contributions to the public welfare through the broader use of Systems Analysis at all levels of government.

What I have to say will be based on our experience in the Department of Defense. But, I want to emphasize at the outset my conviction that the problems of State and local government and the problems of education, natural resource management, pollution of the environment and public health and welfare are no more complex and no less amenable to systematic, rational analysis than are the problems of defense. I need only mention our current problems in NATO and in defeating aggression in Southeast Asia to illustrate the point that we have our share of complex problems. While I would not want to suggest that Systems Analysis has "solved" these problems, I think that it is fair to say that a systematic and integrated approach to the gathering and presentation of information on the alternatives available to our Government has made the work of our responsible decision-makers easier and more productive than it might otherwise be.

* * * * *

There is a great deal that might be said about the Systems Analysis approach. In this statement, I would like to pick out a few of the aspects that seem to me to be especially relevant and to make these points largely by the use of excerpts from *A Modern Design for Defense Decision*.*

In my statement, I would like to expand on the following points:

(1) Systems Analysis is a reasoned approach to problems of decision, accurately described as "quantitative common sense."

(2) Systems Analysis is an application of scientific method, using that term in its broadest sense.

(3) There are limitations in the application of Systems Analysis, although these have often been overstated.

(4) In 1961, the Defense planning and budgeting system had to be changed to permit the application of Systems Analysis.

*Industrial College of the Armed Forces. *A Modern Design for Defense Decision—A McNamara-Hitch-Enthoven Anthology*, edited by Samuel A. Tucker. Washington, D.C., 1966.

(5) Systems Analysis is a regular working contributor to the annual Defense decision making cycle.

(6) Two necessary conditions for the successful application of Systems Analysis as a working part of an operating organization are that it be used by decision-makers, and that it be fed with ideas by a broadly based interdisciplinary research program.

(7) Systems Analysis can be applied to the problems of State and local government, including programs for social welfare.

I. SYSTEMS ANALYSIS APPROACH

Systems Analysis is nothing more than quantitative or enlightened common sense aided by modern analytical methods. What we seek to do in the systems analysis approach to problems is to examine an objective in its broadest sense, including its reasonableness or appropriateness from a national policy point of view, and then develop for the responsible decision-maker information that will best help him to select the preferred way of achieving it. This process of selection requires that we first identify alternative ways of achieving the objective and then estimate, in quantitative terms, the benefits (effectiveness) to be derived from, and the costs of, each alternative. Those aspects of the problem that cannot easily be quantified are explicitly stated. In principle, we strive to identify the alternative that yields a specified degree of effectiveness for the least cost or, what is the same thing, the greatest effectiveness for a given cost. In essence, it is a way of dealing with the basic economic problem—how best to use our limited national resources. So much for what systems analysis is. A few words on what it is not.

Systems Analysis is not synonymous with the application of computers. There is no essential connection between the two. Certainly the development of the former in no way depends on the latter. Some researchers, working within the limits of the systems analysis approach, try to do their analyses by means of large-scale computer simulations. Actually, the computer simulation approach so far has not been particularly fruitful as a method of weapon systems analysis. However, the potential advantages offered by high-speed electronic computers are very great. One of the primary advantages of the computer to the systems analysis function is to permit us to examine a much larger number of alternatives in a shorter period of time than would be otherwise possible. This is especially important in the case of very complex and interrelated systems where hand calculations would limit the time available for the more important work of analysis. I intend to try to exploit more fully the potential of high speed computers. But I would like to make it clear that I view the computer as a mechanical aid in my work and not as the substance of my work.

Moreover, systems analysis is not mysterious or occult. It is not performed with the help of a mysterious black box. A good system analyst should be able to give a clear nontechnical explanation of his methods and results to the responsible decision-makers.

II. APPLICATION OF THE SCIENTIFIC METHOD

I would like now to turn to what I believe are some of the basic characteristics of the Systems Analysis method. Systems Analysis is at once eclectic and unique. It is not physics, engineering, mathematics, economics, political science or military operations and yet it involves elements of all of the above disciplines. But regardless of its make-up, the art of systems analysis—and it is an art—like the art of medicine, must be based on the scientific method, using this term in its broadest sense.

What are the relevant characteristics of scientific method as applied to the problem of choosing strategies and selecting weapon systems, or, for that matter, to the analysis of any problem of public policy involving allocation of the nation's scarce resources. I would like to answer this by quoting a passage from an address I gave before the Naval War College in 1963.

"First, the method of science is an open, explicit, verifiable self-correcting process. It combines logic and empirical evidence. The method and tradition of science require that scientific results be openly arrived at in such a way that any other scientist can retrace the same steps and get the same result. Applying this to weapon systems and to strategy would require that all calculations, assumptions, empirical data, and judgments be described in the analysis in such a way that they can be subjected to checking, testing, criticism, debate, discussion, and possible refutation. Of course, neither science nor systems analysis is infallible. But infallibility is not being claimed; it would be worse than unscientific to do so. However, scientific method does have a self-correcting character that helps to guard science from persistence in error in the long run.

"Second, scientific method is objective. Although personalities doubtless play an important part in the life of the Physics profession, the science itself does not depend upon personalities or vested interest. The truth of a scientific proposition is established by logical and empirical methods common to the profession as a whole. The young and inexperienced scientist can challenge the results of an older and more experienced one, or an obscure scientist can challenge the findings of a Nobel Prize winner, and the profession will evaluate the results on the basis of methods quite independent of the authority of the contenders, and will establish what is the correct conclusion. In other words, the result is established on the objective quality of the Physics and not on the reputations of the persons involved. * * *

"Third, in scientific method in the broadest sense, each hypothesis is tested and verified by methods appropriate to the hypothesis in question. Some are tested and verified logically, some experimentally, some historically, etc. Some sciences, of course, can reproduce experiments cheaply and they tend to emphasize experiment. This is notably the case with the Physical Sciences. In others, particularly some branches of Medicine and the Social Sciences, one cannot experiment readily, if at all, and the detailed analysis of available historical data is most appropriate. In this respect, they resemble Military Science very closely. In choosing weapon systems some experimentation is

possible but a great deal of analysis is also required. In fact, in the development of weapon system analysis, one is more handicapped than in most of the sciences, for fully realistic tests come only at infrequent intervals in war, while the development of new weapon systems also takes place in peacetime. But this argues for better analysis and more heavy reliance on analysis where fully relevant experience is not generally available.

“Fourth, quantitative aspects are treated quantitatively. This is not to say that all matters can be reduced to numbers, or even that most can be, or that the most important aspects can be. It is merely to say that the appropriate method for dealing with some aspects of problems of choice of weapon systems and strategies requires numbers. Nonquantitative judgment is simply not enough. What is at issue here really is not numbers or computers versus words or judgments. The real issue is one of clarity of understanding and expression. * * *

“Numbers are a part of our language. Where a quantitative matter is being discussed, the greatest clarity of thought is achieved by using numbers instead of by avoiding them, *even when uncertainties are present*. This is not to rule out judgment and insight. Rather, it is to say, that judgments and insights need, like everything else, to be expressed with clarity if they are to be useful.

“Let me emphasize the point about uncertainties. Many people seem to feel that quantitative analysis is not possible if there are any uncertainties. But this view is incorrect. In fact there is substantial literature on the logic of decision-making under uncertainty going back at least as far as Pascal, Bernoulli, and Bayes in the 17th and 18th centuries. Moreover, there are simple practical techniques for dealing with uncertainty which make it possible to do analyses that point up the uncertainties for the decision-maker and indicate their significance. In fact, rather than conceal uncertainties, a good analysis will bring them out and clarify them. If it is a question of uncertainties about quantitative matters such as operational factors, it is generally useful to examine the available evidence and determine the bounds of the uncertainty. In many of our analyses for the Secretary of Defense, we carry three estimates through the calculations: an “optimistic”, a “pessimistic”, and a “best” or single most likely estimate. If there are uncertainties about context, at least one can run the calculations on the basis of several alternative assumptions so that the decision-maker can see how the outcome varies with the assumptions.”

III. THE LIMITATIONS OF SYSTEMS ANALYSIS

I have frequently been asked about the shortcomings and limitations of the systems analysis approach. Let me refer to an article I wrote for the Naval Review, 1965, reprinted in *A Modern Design for Defense Decision*.

“What’s wrong with systems analysis? What are its particular limitations and biases?” One criticism I have heard is that emphasis on quantitative analysis risks ignoring those factors that cannot be reduced to numbers, or at least over-emphasizing those that can.

“Suppose, for example, that the problem is to choose between two alternative ways of destroying a certain set of targets. The less costly way is to base short-range missiles on the territory of an ally; the more

costly way is to cover the targets with long-range missiles based in the United States. But suppose basing the missiles on the ally's territory would lead to political difficulties, to the embarrassment and possible fall of a friendly government. How does one take account of such political aspects in a quantitative analysis? The answer is that one doesn't. There is no way of "grinding in" the potential political difficulties of an ally. The most the analysis can do is to make clear to the decision-maker the differences in cost and effectiveness between the two approaches so that he can make an informed judgment about their weight in relation to the political problems.

"I would not want to deny that there is potential danger here, even though there is nothing about the systems analysis approach that prevents an assessment of the political or other nonquantitative factors from being included in the staff work. I am confident that the top-level leaders of the Department of Defense who use systems analyses as one of their sources of information are careful to give balanced consideration to all factors, whether quantitative or not.

"Another criticism sometimes made is that application of the 'flat of the curve' argument to force or performance requirements may lead people to ignore the decisiveness of a narrow edge in superior performance. There is a danger here if an unwary analyst confuses *performance* and *effectiveness*. There is no question but that, in some cases, a narrow edge in performance may have a very great impact on effectiveness. The performance advantage of the Japanese Zero fighter over American aircraft at the beginning of World War II is a good case in point. But there are other cases in which even a substantial increase in performance, purchased at a high price, may have a small impact on effectiveness. For example, many Navy aviators believe that under today's conditions, a substantial speed advantage in attack aircraft may mean rather little in terms of increased effectiveness. It is easy to confuse performance and effectiveness. But this mistake is clearly not peculiar to the systems analysis approach. The only way to avoid it, and to relate performance to effectiveness properly, is with the help of good analysis.

"Next, it is argued that the system analysis approach may be biased against the new and in favor of the old. I am sometimes concerned that our analyses may be subject to such bias, but I think that the method of open explicit analysis is much less likely to be so biased than is reliance on judgment or intuition or experience unsupported by analysis. The reason for the bias is that we all tend to compare the old and the new in the current mission that happens to have been optimized for the old. * * *

"Finally, sometimes it is said that systems analyses oversimplify complex problems. Of course, we have to simplify the complex problems we face; no one could possibly understand most problems of modern weapon systems and strategy in all their complexity. And it is a natural human failing to oversimplify. But I believe the facts are that the systems analysis approach is much less prone to oversimplification than any alternative approach. For it is part of systems analysis to bring to bear all of the best of modern analytical techniques for organizing data and summarizing clearly its most relevant aspects. Moreover, reliance on the method of open, explicit analysis is our best guarantee against persistence in harmful oversimplification. For if I must lay

out clearly all of my assumptions, objectives, factors, and calculations, my critics can see what I have done and point out where I have oversimplified, if indeed I have done so. But if I am allowed to keep it all in my head and appeal to experience or judgment, others have no way of knowing whether or not I have oversimplified the problem.”

IV. INTRODUCTION OF SYSTEMS ANALYSIS IN THE DEFENSE DEPARTMENT

Although systems analysis is a reasonable and straightforward concept, it was not an easy one to implement in the Department of Defense. In conducting a sound cost-effectiveness study you must be able to associate both the benefits and costs with the alternatives to be examined. The Defense management system as it existed five years ago did not permit this. Assistant Secretary Hitch described the problems he encountered as follows:

“In 1961, the chief, in fact the Secretary’s only systematic and comprehensive vehicle for the allocation of resources in the Defense Department, was the annual budget. For the task which it was being asked to perform, it was deficient in several respects. The budget focused on the financial problems of a single upcoming fiscal year, thereby discouraging adequate consideration of decisions whose near term dollar impact was slight but whose impact in later years was very large, to the point of becoming an important constraint on Defense managers. The structure of the budget, which portrays the Defense program in terms of broad functional purposes (e.g., personnel, procurement and construction) and organizational components also limited its usefulness as a management tool. Rational military strategies and force requirements have to be planned and expressed in terms of the final products of the military program such as numbers of combat ready divisions and deployed missiles, rather than in terms of the basic resource ingredients of the budget. Moreover, in the Department of Defense at that time there was an almost complete dichotomy between military planning, which was long range, expressed in terms of outputs, and performed by military planners in the Joint Staff and the Military Departments; and budgeting, which was short range, expressed in terms of inputs, and performed by the Comptroller organization.

“It was to bridge the gap between these two functions that we designed and installed the ‘programming’ system. By linking military planning and budgeting in a unified planning-programming-budgeting decision-making process we are able to produce a single departmentwide blueprint for the future known as the ‘Five Year Force Structure and Financial Program’. The program projects not only the military forces needed to meet the requirements of our long-range military plans but also the personnel, equipment, supplies and installations required to support them. In addition, the program projects the full costs of these resources, thereby permitting responsible decision-makers to assure themselves that the program they are planning is financially feasible and is providing a sound basis for the development of our annual budget requests to Congress.

“The Five Year Program is organized by forces and weapon systems grouped by mission. At the broadest level of aggregation, there are ten major military programs—the Strategic Retaliatory Forces, the Con-

tinental Air and Missile Defense Forces, the General Purpose Forces, Airlift and Sealift Forces, and Research and Development Program, etc. These major military programs are made up of subaggregations. These, in turn, are made up of 'program elements' which we consider the basic building blocks as well as the decision-making level of the programming process. A 'program element' is an integrated force or activity—a combination of men, equipment and facilities whose effectiveness can be directly related to national security objectives. The B-52 bomber force, together with all of the supplies, bases, weapons, and manpower needed to make it militarily effective is such a program element. Other examples would be attack carriers or infantry divisions. There are in all about 1,000 program elements. Groupings of program elements are based on a common mission or set of purposes, with elements either complementing each other or being close substitutes which should be considered together when making major program decisions."

The Programming System thus allows the reader to see at a glance how much of the Department of Defense Budget is going to strategic retaliatory forces and how much of that is going to each of the major weapon systems included in that category. This is clearly a far more meaningful way of subdividing the Defense Budget from the point of view of determining its overall shape. But even more importantly, the programming system permits us to relate both benefits and costs to the forces and activities that must be compared and planned. This feature is essential to any agency that hopes to apply the Systems Analysis approach to its problems.

V. THE WORK OF SYSTEMS ANALYSIS

The primary function of Systems Analysis in the Pentagon is to assist the Secretary of Defense by developing information that will be useful to him in making key decisions on force levels and resource requirements. For this reason the work of the staff is tied very closely to the annual Defense decision-making cycle which is based on detailed continuing requirements studies. Carefully formulated, detailed analytical studies are basic to sound decisions on force and resource requirements. We develop each year a program of studies that we believe should be conducted during the coming year. These proposed studies are submitted to the Secretary who reviews them, decides which ones he feels are required, and requests the Joint Chiefs of Staff and the Service Secretaries to have their staffs conduct them. My staff works closely with the groups that are actually conducting the studies to advise them on methodology, selecting assumptions, and to insure that the study is focused on the questions the Secretary feels need answering. When the studies are completed and submitted to the Secretary we assist him by reviewing them, indicating weaknesses, summarizing them for his use, etc.

The completed studies normally serve as the basis for proposed changes to the Five Year Defense Program. These changes may be submitted by one of the military departments or by the Joint Chiefs of Staff. Proposed changes to the Force Structure are then reviewed in depth by the staff of the Office of the Secretary of Defense. We in Systems Analysis emphasize "cost-effectiveness" studies of the proposals, comparing each with the previously approved force and other

alternative ways to accomplish the mission. The Secretary then makes tentative decisions on the Force Structure. These tentative decisions are reviewed by the Joint Chiefs of Staff and the Military Departments, who have the opportunity to make further recommendations. After further discussions with his principal military and civilian advisers, the Secretary of Defense makes his final decisions, and these decisions serve as the basis for the annual budget. The budget is reviewed by the Secretary in the fall of each year and, of course, submitted to Congress in January. By this point we are well into the next cycle and new requirements studies are being initiated.

Throughout the decision-making cycle, Systems Analysis emphasizes integration of the various elements of the defense program and focuses on the broad national security objectives. This should be a primary objective of any Systems Analysis staff, at the Federal, State, or local governmental level, as it is an area in which most government organizations are weak. This was particularly true in Defense five years ago.

A 1961 organization chart of the Department of Defense would show the advisers to the Secretary of Defense on forces and military strategy, the Joint Chiefs of Staff; the adviser on research and engineering matters, the Director of Research and Engineering; the adviser on financial matters, the Comptroller; the adviser on production matters, the Assistant Secretary for Supply and Logistics; the adviser on international matters, the Assistant Secretary for International Security Affairs; etc. Each adviser was concerned primarily with his own specialty rather than the Defense program in its entirety. The Secretary of Defense, virtually alone, was expected to integrate all of these diverse facets personally and to do so without systematic assistance.

The Programming System was developed to provide one mechanism for integrating the diverse parts of the Defense program, especially to integrate force planning with budgeting and support programs. The Systems Analysis Office was established to gather and display information associated with these different areas in a manner that would show the Secretary of Defense how the pieces fit together. Its work cuts across these various specialties. Of course, the information that we provide the Secretary of Defense is only one of many inputs available to him, and the integrating functions that we perform in no way reduce the very great importance the Secretary attaches to the advice and information provided by the Joint Chiefs of Staff and his other civilian advisers.

VI. SOME IMPORTANT PRECONDITIONS FOR SUCCESS

Two conditions seem to me to be necessary to the successful development and functioning of a Systems Analysis group within a policy making organization. The first is that the responsible decision-makers make use of Systems Analysis and take it seriously. Without this, the professional personnel will recognize in time that their work is not influencing the course of events and their motivation is likely to be destroyed. By using Systems Analysis and taking it seriously, I do not mean that the decision-makers must accept the results of the analyses uncritically or that they must rely exclusively on the Systems Analysis

input. Far from it. Every analysis must be based on many assumptions, and a responsible decision-maker may not choose to accept the assumptions that his analysts have made. What is important is that the analyses be given a fair hearing and be acted upon if they successfully stand up under reasonable debate and criticism; or, if they are not acted upon, that the analysts are told why so that they can correct their work in the future. The analysts must have this "feedback" from the decision-makers if they are to know which issues are considered relevant or significant, which objectives the decision-makers wish to pursue, and which assumptions appear to them to be plausible. A Systems Analysis capability installed as "window dressing" is not likely to develop into a good one.

The second necessary condition is that the Systems Analysis operation be fed with ideas growing out of a broadly based interdisciplinary research program. A research program is necessary in order to develop analytical tools, to define criteria and objectives for programs, and to invent new alternatives for achieving the objectives. Certainly, in Defense, the research program must be interdisciplinary, because the scope and complexity of Defense problems is too great to be encompassed with any single discipline. I am sure that this would also be true of Systems Analysis applied to major social problems outside of Defense.

One practical implication of this is that, generally speaking, research funds in these fields are likely to be better spent supporting research institutes containing groups of scholars from a variety of relevant disciplines oriented toward the problems, rather than on individual scholars who are more likely to be oriented toward the exercise of their academic specialties.

VII. SYSTEMS ANALYSIS NON-DEFENSE APPLICATIONS

Finally, let me repeat my conviction that Systems Analysis can be applied fruitfully to social problems. I feel certain that good analysis can assist in the design, development and consideration of alternative approaches to education, health, urban transportation, justice and crime prevention, natural resources, environmental pollution and numerous other problems. In fact, there is already a great deal of useful research going on in these areas.

It is often suggested that these problem areas will be resistant to systematic analysis because they do not lend themselves to quantification. In commenting on that, I would like to point out that we, in the Defense Department, also have our own imponderables to deal with. We try to measure those things that are measurable, and insofar as possible, to define those things which are not, leaving to the responsible decision-makers the job of making the difficult judgments about the imponderables. It has been our experience that in those areas most difficult to quantify, years of research and the application of a good deal of ingenuity will often yield ways of measuring and making comparisons that were not available at the outset.

Ultimately, policy decisions will be based on judgments about relative values, the likelihood of uncertain future events, which risks we should and should not run, et cetera. But, in Defense, and in these other areas as well, good analysis can do a great deal to sharpen the

issues, clarify the alternatives available to the decision-makers, and narrow substantially the range of uncertainty, thus freeing the responsible officials to concentrate their attention on the crucial judgments.

[Royal Society Nuffield Lecture, London, England, October 25, 1966]

DECISION-MAKING IN LARGE ORGANIZATIONS

By Charles J. Hitch

(Vice President for Administration, University of California; former Assistant Secretary of Defense, Comptroller)

It gives me very special pleasure to address the Royal Society on this subject during the Presidency of Professor Blackett. Six years ago, before joining the U.S. Department of Defense, I had occasion to refer to Professor Blackett's 1948 paper on "Operational Research" in *The Advancement of Science* as "after eleven years, one of the best . . . introductions to operations research available." In that paper Professor Blackett stated: "The problems of analyzing war operations are . . . rather nearer, in general, to many problems, say, of biology or of economics, than to most problems of physics."

The management techniques I am discussing this evening, which I think of as part of economics rather than biology, are now collectively known in the U.S. as the planning-programming-budgeting system or PPBS (with that penchant for substituting letters for names which we learned from the British). They are direct lineal descendants of the wartime operational research to which your President made such important contributions. Of course, like people, they have other parentage (and "ancestrage") as well.

I should like to do three things in the hour at my disposal: third, leave some time for discussion; first, sketch the development of PPBS in the Department of Defense under Secretary McNamara and explain the rationale of that development; and second, outline some of the problems and risks as well as the opportunities in extending PPBS rapidly to other areas, such as civilian government departments, education and industry. Fourteen months ago, in August 1965 President Johnson directed all American government departments and agencies to introduce PPB systems similar to that of the Department of Defense: most are still struggling manfully to learn just what this means and how to comply.

I have referred to the management techniques which comprise PPBS. What are they? There are two, related and mutually supporting but distinct, in fact so distinct that it is possible to use either without the other. One is called "program budgeting," or more simply "programming." Since "program budgeting" is sometimes used more broadly to mean the whole PPB system, I will use the simpler term "programming" to describe this part of the system. Programming as an activity produces a program or program budget which has the following characteristics. First, it is organized or classified by programs rather than, as traditional budgets are, by objects of expenditure. Or, if you prefer, it is classified by "outputs" which are objective-oriented rather than "inputs." Secondly, the resource requirements and the fi-

nancial or budget implications are linked to these programmed outputs. And thirdly, the program extends far enough into the future to show to the extent practical and necessary the full resource requirements and financial implications of the programmed outputs. In the Department of Defense programmed outputs are usually shown for eight years and the financial implications for five years.

The second of the two management techniques in PPB is variously named "systems analysis," "cost effectiveness analysis," or "cost benefit analysis," as well as by various other names, including operations or operational research. The whole system seems to be singularly plagued by terminological confusion. I hope that, like someone said of the music of Wagner, it is better than it sounds. Let me call the second technique "systems analysis" this evening since that is its official name in the Department of Defense. Systems analysis in this sense is analysis, explicit quantitative analysis to the extent practical, which is designed to maximize, or at least increase, the value of the objectives achieved by an organization minus the value of the resources it uses.

These two techniques, programming and systems analysis, were introduced into the Department of Defense by Secretary McNamara for one purpose—to improve high level planning in the Department, i.e., planning at the level of Department of Defense headquarters, Service headquarters, and the headquarters of the unified commands. Other management functions in the Department of Defense, such as control and operations, were not affected except indirectly by these particular McNamara innovations. Even the format of the annual operating budget as appropriated by Congress and accounted for by the Department's accounting staffs was unaffected, at least initially. Instead, and this I believe proved to be satisfactory enough, we developed a torque converter for translating the five-year program into the budget format and vice versa.

I emphasize the exclusive relation of these techniques to the planning function for clarity in explaining their rationale, certainly not to disparage them, for I consider planning in its various aspects to be *the* important function of top management in any large organization, whether government, business, or education. Before saying more about the technique let me make some general remarks about the nature of planning. The planning function can be analyzed in a number of different ways. First, of course, by how distant the future time period with which it is concerned. We have short-range planning—planning for the use of existing facilities and resources. We have intermediate-range planning—the planning of procurement and construction of new facilities. And we have long-range planning—the planning of new developments with very long lead times, like new major weapons systems in Defense or new campuses for the University of California. In Defense we generally found a ten-year planning cycle long enough for most of our developments. In the University of California the lead times are longer. New campuses require that we look 35 years ahead, to the year 2000, and we attempt to do so.

Another distinction which is critical to much of my discussion is that between substantive planning and fiscal planning. Fiscal planning is the planning of future budgets—how much money and how to spend it. Substantive planning is the planning of objectives—ultimate objectives and intermediate objectives. In the Department of Defense

substantive planning is called military planning; in the University it is called academic planning. Both fiscal and substantive planning can be short, intermediate, or long-range.

I repeat, the reason we introduced the two techniques of programming and systems analysis in the Department of Defense in 1961 was to improve the exercise of the planning function, which we found in disarray. We introduced programming to make the military planning of the Department realistic, to make it face up to the hard choices by linking it to fiscal planning, from which it had been divorced. And we introduced systems analysis to provide a criterion or standard for making the hard choices, to achieve some rationality and optimality in the planning.

When I say that planning was in disarray at the beginning of 1961 I mean just that. There was plenty of planning activity of all sorts: short-range, intermediate-range, long-range, substantive and fiscal. The key to the disarray was the almost complete separation between substantive or military planning and fiscal planning. These two types of planning were performed by two different groups—the military planning by the Joint Chiefs of Staff and the military planners in the Services, and fiscal planning by the civilian secretary and the comptroller organization throughout the Department. Secondly, these two types of planning were couched in different terms, not readily translatable and in general not translated. Military planning was in terms of army divisions, navy ships, fighter aircraft squadrons, and so forth—military units or weapons systems, the “outputs” of the department. Fiscal planning was in terms of budget categories, which were military personnel, operations and maintenance, procurement, research and development, military construction—“input” categories. In practice, the long-range and intermediate-range military plans of the Joint Chiefs of Staff and the Services were either not costed out in terms of their budget requirements or this was done so roughly and unreliably as to be unuseable. Thirdly, the two types of planning were for different time periods. There were intermediate-range and long-range military plans but no fiscal plans extending beyond the next budget year.

In consequence, the intermediate-range and long-range military planning was largely ineffective. The Department of Defense, one of the world's largest organizations, had no approved plans extending more than one year into the future. Each year the Joint Chiefs of Staff would produce its massive intermediate-range plan called the Joint Strategic Objective Plan (JSOP) with Force Tabs extending five to ten years into the future, and would send it to the Secretary of Defense, who would note it and file it. Before McNamara no JSOP was ever approved. Then in the budget season, in October and November, the real life decisions were made by civilian secretaries advised in the main by the comptroller organization. Why was the JSOP ignored? Primarily because it was financially infeasible. It was more or less a pasting together of the wish lists of the four military Services. If costed out, the budgets it required would be far in excess of what any Secretary of Defense or President or Congress would approve. The system in short did not require the military planners to face up to the hard choices that are part of responsible management. Let me emphasize that this was not the fault of the military planners but of the

system. In organizations with similar systems, academic planners and business planners act just like the military planners.

But since the military planners didn't make the hard choices, the civilian secretary had to as best he could in his budget review, and without much help from intermediate-range or long-range military plans. The method which he used in his budget review, lacking any other, might be described generically as the "budget ceiling" approach. The President would indicate the general level of defense budget he felt was appropriate to the international situation and to his over-all economic and fiscal policies. The Secretary of Defense, by one means or another, would allocate this figure among the three military departments. Each military department would in turn prepare its basic budget submission, allocating its ceiling among its own functions, units, and activities. It was recognized long ago that this was a rather inefficient way to go about preparing the defense budget. For one thing, the budget submissions didn't provide the right kind of information for program decisions. It wasn't organized by programs and it extended only one year into the future. Secondly, the decisions were too decentralized to achieve a balanced over-all program. Each Service naturally 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, and protecting the over-all size of its force structure. The Air Force, for example, gave overriding priority to the strategic retaliatory bombers and missiles, starving as necessary the tactical air units needed to support Army ground operations and the airlift units needed to move limited war forces quickly to far off trouble spots. 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. The Army used its limited resources to preserve the number of its divisions, although this meant that they lacked equipment and supplies to fight effectively for more than a few weeks. Moreover, because attention was focused only on the next fiscal year, the Services had every incentive to propose large numbers of new starts, the full cost dimensions of which would only become apparent in subsequent years. This is the "foot in the door" or "thin edge of the wedge" technique which one-year-at-a-time approaches to budgeting greatly encourage.

So every year the plans and programs of each of the Services had to be cut back to fit the budget ceiling by program cancellations, stretch-outs, or postponements—but only for that year. Beyond the budget year unrealistic plans continued to burgeon. Perhaps next year the budget would be higher.

We introduced the program, the official name of which is the "Five Year Force Structure and Financial Program," to correct the basic flaw in the system, namely the separation of planning and budgeting. You will recall that the program is organized by outputs like the military plans, which can be related to national, military, and foreign policy objectives far more readily than the traditional budget categories. The basic elements of the program are force units, like Army Infantry Divisions, or weapons systems, like Minuteman Missiles, or development projects, like the Nike-X Antimissile Missile. The sum

total of the program elements, of which there are about a thousand when one includes the overhead elements, is the total program of the Department. You will also recall that each program element has with it its full resource and financial costs year by year, five years into the future, for all the men, equipment, supplies and installations required to make it effective, irrespective of the budget category in which the funds are appropriated. The total dollars required for the program each year are within limits which the Secretary of Defense considers appropriate and feasible. The program shifts the emphasis from cost in next year's budget to cost to complete and operate a weapons system or program.

The program, once established in 1961, is continuously in being. There is always a program, an approved program, but a program change procedure results in several billion dollars worth of changes in the program each year. Any office of the Department of Defense may propose a change in the program at any time. All major changes have to be approved by the Secretary of Defense after review and recommendations by the Joint Chiefs of Staff. So we end up with a planning, programming, budgeting system with the program linking the military plans on the one side and the budget on the other.

The function of the planning in the planning-programming-budgeting system is to develop alternatives—better alternatives—to those in the current approved program. The planning is carried out at all levels of the Department and it takes three forms. One of these is the more or less traditional military planning like that which was embodied in the JSOP, which continues. The second is systems analysis, about which I will say more later, and the third consists of blends of the two. The budget has become in effect the first annual slice of the five-year program. The annual budget review continues but it has become an intensive final analysis of the financial requirements of the program for the next fiscal year, rather than a review of the program itself.

The second of the management techniques which comprise the PPB system is called "systems analysis" or "cost effectiveness" or "cost benefit analysis" or "operations research." It is nothing more or less than economic analysis applied to the public sector. Economic analysis is concerned with the allocation of resources. Its basic maxim is: maximize the value of objectives achieved minus the value of the resources used. In business this reduces itself to maximizing profits, both income and outgo being measured in dollars. In Defense and generally in the public sector we lack a common valuation for objectives and resources and therefore have to use one of two weaker maxims—maximize objectives for given resources, or minimize resources for given objectives. This is what a systems analysis attempts to do—assist the decision-maker to choose weapon systems and modes of operating them which maximize some military objective or objectives (for example, the number of attacking bombers or missiles shot down) for given resources (for example, budget dollars) available. The function of the program is to cost out the plans to keep them feasible and realistic, to make the planners face up to the hard choices. The function of systems analysis is to get dollars into the calculations at an earlier stage—into the planning process, into the evaluation of alternative ways of achieving a military objective. You can't choose the optimal way or even a good way without knowing about the alternatives—

what the alternatives achieve and what they cost. From small beginnings which long antedated McNamara—in fact they date back to Blackett—the use of systems analysis has been rapidly expanded since 1961 until it has become a vital part of the planning and decision-making process in the Department of Defense. Since last September it has become the sole function of an Assistant Secretary of Defense.

Let me digress to emphasize the very partial role which systems analysis necessarily plays in optimizing decisions. I have said that it assists the decision maker. It attempts to inform and sharpen his intuition and judgment; it does not itself make the decision. In operations research it is customary to distinguish between optimizing models and predictive models. In this application the two blend into each other. Our aim is to help the decision maker. What help does he need in making a decision—in choosing among alternatives? He needs to know the consequences of his choices—positive consequences, in achieving his objectives, and negative consequences or “costs” in a broad sense. If he has a single measurable objective and is interested in only one kind of cost—say budget cost—it might well be possible to design an optimizing model—a systems analysis—which would, in effect, make the decision for him. I have never encountered such a pure case in the real world, although I know of some which approximate it. In the typical case there are several objectives—some intangible—and several relevant costs. The systems analyst must predict the important consequences, i.e., those which are important in assisting the decision maker to make his own intuitive optimizing choice.

So, in summary, the program provides the link between planning and budgeting, relating forces and their costs to national security objectives, while systems analysis provides the quantitative analytical foundation in many areas, by no means all, for making sound choices among the alternative means of achieving the objectives. Between them they give the Secretary of Defense the tools which are necessary for planning a program with balance and some rationality, and therefore for the unified management of his \$60-billion-a-year department. For the first time the Secretary of Defense is capable of exercising the authority given him in the National Security Act of 1947, which attempted to unify the military services.

I have spent so much time explaining what happened in the Department of Defense that I have little left to answer the question “Whither?” This is perhaps as well for I know more about the past than about the future. Let me speculate with some shorthand points. First, all large organizations, whether government, business, or mixed, have many problems in common. I am very impressed with their similarities, having recently moved from one large organization to another which sounds very different, but which has many of the same problems. Among these is the problem of achieving realistic, balanced, rational plans. I found academic planning in U.C. in the same kind of disarray as military planning in the Department of Defense, and for the same reason. So I am sure that similar techniques have widespread application in other organizations.

Secondly, in fact they already have widespread application. The Department of Defense is not the first organization to develop a financial plan or program which extends more than a year into the future, and which has evolved budget categories more suitable for

planning—for intermediate and long range fiscal planning—than objects of expenditure. Other organizations have confronted and more or less satisfactorily solved the problems of unrealistic and too decentralized planning. Similarly, many well managed businesses make explicit, quantitative economic analyses of, for example, alternative equipment and facility plans, which are indistinguishable from what is called systems analysis in the Department of Defense. I was reading last week in the *Economist* that cold-blooded calculations by major British advertisers made it very difficult for the *Times* to sell enough advertising to break even financially. Operations researchers have assisted military, other governmental and business planners with varying degrees of success for the past 25 years. What is different in the Department of Defense is that systems analysis has there become a generally accepted way of life, perhaps for the first time in any large public organization.

Thirdly, there are risks and dangers as well as opportunities in trying to move too far too fast in the application of new management techniques like these, including the risk of discrediting the techniques. Although it did not appear easy at the time, there is no doubt in my mind that the Department of Defense (or much of it) is easier to program and to analyze quantitatively than many areas of civilian government. For example, it is easier than the foreign affairs area, where I have perhaps foolheartedly been attempting to advise the State Department on how to install a planning-programming-budgeting system. And quite apart from ease or difficulty the substantive problems in other areas are different and new. In Defense we had several hundred analysts at the RAND Corporation and elsewhere developing programming and systems analysis techniques for a decade before the Department attempted any large scale general application. No remotely similar preparatory effort has gone into any other governmental area and the number of trained and skilled people is so limited that they are inevitably spread far thinner in other departments of government than they were and are in Defense.

But fourth and finally, to end on an encouraging note, although these techniques are mutually supporting, we are not dealing here with a matter of either/or. There is an infinity of degrees. Not only may one introduce a program budget without systems analysis or vice versa, but each may be used in limited areas or ways, and sometimes quite productively. For example, in foreign affairs, where quantification of objectives and therefore full systems analysis is so difficult, one can, I think, organize the budget more meaningfully for planning purposes. In many areas a systems *cost* analysis is possible and useful although a full systems analysis, involving measurement of objectives, is not as yet. I am convinced that there are some American institutions (I would not dream of referring to British institutions) which are quite ripe for the application of some efficiency-inducing management techniques, and for basically the same reason that the military was ripe. American hospitals, for example, have, like armies and navies, traditionally and proudly operated on a not-for-profit basis. Just as the Generals and Admirals asked: "What do dollars matter when national security is at stake?", the doctors and hospital administrators ask "What do dollars matter when life is at stake?". (I have heard educators ask "What do dollars matter when the quality of the next gen-

eration is at stake?") Well, the dollars do matter. Granted that these are all high priority claimants on the national purse and that there is a kernel of truth in each protesting cry, the importance of objectives does not justify ignoring the canons of economy and efficiency—which are to achieve the most from whatever limited resources the nation, in its wisdom or unwisdom, places at our disposal.

[*Bulletin of the Atomic Scientists*, Vol. XXII, No. 9, November 1966]

ON THE COST-EFFECTIVENESS APPROACH TO MILITARY RESEARCH AND DEVELOPMENT

By Klaus Knorr

(Professor of Public Affairs and Director, Center of International Studies,
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The cost-effectiveness technique compares alternative ways of accomplishing an objective in order to determine the solution that contributes the most at a given cost, or that achieves a given objective at the least cost. I regard the cost-effectiveness technique as a most valuable tool for elucidating choices in military capabilities. However, the measure of its usefulness depends crucially on the sense of restraint with which the tool is applied and its product appreciated. From this point of view, I am concerned, not with the popular objections to the technique, but only with those that its advocates themselves admit. Since these limitations are well known, I will state them in summary fashion.

First, the cost-effectiveness approach has unlimited power when normative problems are answered by givens, so that we face a pure and simple problem of maximization, and when all costs as well as benefits are known and can be quantified. This means that the technique is at its most useful when the objective or output is definitely fixed—that is, when there is only one dependent variable, and the sole task is to minimize the costs which are readily and accurately measured. In these cases, alternative means to achieving the objective differ only in this key variable, and choosing the cheapest means in this sense is the only problem.

On the other hand, it is generally agreed that the approach is less useful in clarifying choices when the employment of different means leads to appreciably different outputs. Its usefulness is the more restricted, the more incommensurable the outputs and the more appreciable and unmeasurable the social costs other than those quantifiable in terms of money. That is to say, the usefulness of the technique is the more limited, the less the problem is capable of uniform quantification. This limitation is really obvious since rational decisionmaking requires us to maximize the value of all benefits minus the value of all costs or disadvantages.

The utility of the technique depends very importantly on the completeness with which costs and benefits are analyzed. I stress particularly costs other than money, for these can be of great variety and, it seems to me, they are easily lost sight of. They may be political, as when a particular choice causes great inconvenience to an ally, or military, as

when choice engenders a sharp decline in the morale of service. Surely, service morale is an asset and its deflation is, as such, a disadvantage. We might want to accept this disadvantage if the net benefits of a choice promise to be very substantial, but we should hardly ignore or neglect it. To the extent that costs and benefits cannot be measured with accuracy, and to the extent that the problem is one of deciding, in an inherently subjective manner, between different sets of costs and benefits, problems of choice are insusceptible to rigorous economic analysis.

A second great limitation of the cost-effectiveness approach results from imperfect information. In the military area, various incalculable uncertainties must be faced often. Costs may be uncertain, technology may be uncertain, the properties of military conflict situations may be uncertain, and the reactions and capabilities of potential enemy nations are apt to be uncertain. This last uncertainty is of particular import; it is imperative that military choices be examined within a framework of interaction. An opponent's response to our choices may, after all, curtail or altogether nullify the advantages we seek. Nor is it enough to recognize the conflict aspects of the problem. The possibilities of tacit or formal cooperation may be equally significant.

I would, somewhat recklessly, add a third potential limitation of the cost-effectiveness approach, and that is the salience it inevitably attributes to the criterion of purely monetary costs. Of course, I realize that, in a world of scarce resources, this must be an important yardstick. But for the moment, let us make the outrageous assumption that *other* costs or benefits lend themselves as readily to quantification as estimated monetary costs do. Should we then not consider whether, in societies becoming ever more affluent, monetary costs, though important, should not be expected to decline in importance relative to other values? For example, would the minimization of military conflict, or of loss of human life in the event of conflict, not gain importance in relation to monetary sacrifice? This consideration should certainly make a claim on our attention whenever the monetary sacrifice involved in choices is, absolutely speaking, rather small. Thus, if we wanted to apply the cost-effectiveness technique to assessing the worth of the approach itself, its financial costs would probably be regarded as relatively trivial, and we would look toward more significant criteria of the disadvantages of cost-effectiveness studies. Now, other criteria do not, unhappily, permit quantification nearly as much as money costs do. But, to the extent that this is the case, and that it accounts for our preference to focus on money costs, are we then not saying that the value of this focus on monetary costs is derived from the convenient fact that they are capable of easy measurement?

There is general agreement that the two major limitations I stated first greatly restrict the usefulness of the cost-effectiveness approach in making high-level decisions on military matters, for such decisions do involve choice-of-objective problems and bristle with intangibles and uncertainties. It is to complex problems of this kind that the technique is in fact applied, and should be applied. To do so is, if rightly done, entirely proper and unquestionably useful. But not only are differences in money costs usually important; to proceed rationally, we must obviously also regard *all* advantages of a policy as a return, and *all* disadvantages as a cost, and define the best policy as the one which offers the largest margin of return over costs.

ROLE IN DECISIONMAKING

However, it is precisely at this point that we encounter the problems of management. One problem is that the value of cost-effectiveness analysis is sensitive to the resources and time given to it, and that hasty analyses may do more harm than good. A critical factor along this line may be the tendency for the pressure of the budgetary cycle to deny sufficient time.

A second problem is that—partly as a result of time pressure—cost-effectiveness studies are fragmentary, all costs and benefits do not receive due attention, and money costs claim undue emphasis. To put it more crudely, we may have too many cost studies and not enough cost-benefit studies; analyses overemphasizing money costs may just pretend to be cost-effectiveness studies.

This leads me to the related third problem: that the cost-effectiveness approach be given no more influence on decisions than, in view of the inevitable or practical limitations of its studies, it can legitimately claim. The technique may be a scientific technique, yet its application is an art—that is, an activity heavily dependent on imagination and judgment. There is nothing wrong with cost effectiveness as a tool, but a great deal could be wrong with its exploitation if it is not governed by an inventive imagination and good judgment. Let me describe some additional dangers arising in its exploitation, nearly all of which have been discovered and acknowledged by proponents of the technique.

The central issue is that cost-effectiveness studies must count for no more, and no less, than their due. They got less than their due before McNamara became Secretary of Defense. The question is whether there is not now a tendency in the Department of Defense for some of these studies, suffering from the lack of balance I have discussed, to receive more than their due. If true, this would be a serious matter, especially in the case of important, very high-level decisions regarding which, it is generally agreed, the cost-effectiveness technique can make only a very limited, though valuable, contribution. I do not *know* that there is now a tendency in the Defense Department for cost-effectiveness studies to be accorded excessive attention and weight, but I suspect that this is so. I suspect rather than know because what evidence I have is very little and rather indefinite.

The evidence is of two kinds. First, a considerable number of people who have been close to the decisionmaking process, and whose judgment I respect, have told me that the tendency prevails. Second, I read with care McNamara's 1963 testimony on why he preferred a conventional-fuel to a nuclear-fuel aircraft carrier. In his very lengthy testimony, McNamara came back again and again to the difference in money costs but, though several senators pressed him with intelligent and pertinent questions, he never explained why the advantages of the nuclear carrier were not worth the difference in these costs. He contented himself with stating flatly that he did not think they were, while citing eagerly and at length some dubious analogies: why he personally was better off buying a medium-price rather than high-price automobile; why a farmer, having to transport produce to the market from time to time, might be better off with a cheaper and slower truck rather than with a speedier and more expensive one. The trouble with these analogies is that they explain the cost-effectiveness

principle—especially, a stripped-down version of it—but they do not explain at all the superiority, as a buy, of a conventional over a nuclear carrier. Obviously, Secretary McNamara has far better information on the factors affecting his choice of automobile than he could possibly have about the future utility of different aircraft carriers in different contingencies whose probabilities are unpredictable. He also could easily make some simple assumption about the hypothetical farmer's transportation problem, but similar assumptions about the future missions of aircraft carriers are more difficult to make. I had the strong impression that the money-cost difference and the stripped-down cost-effectiveness model were foremost in the Secretary's mind, and that the very complicated guesswork on possible demands on aircraft carriers some years hence was not.

This leads me to the proposition that the attention paid by decision-makers to complex problems of choice should accord no more salience to cost-effectiveness studies than they can properly claim. This precept is more easily expressed than implemented. Implementation requires that the total problem be subjected to orderly conceptualization, that the intangibles as well as the quantitative factors be properly analyzed, and that an attribution of relative priorities guide the decisionmaker in how to bring various parts of the analysis to bear on the problem of choice. This last condition is very important in a bureaucracy in which decisions are prepared at various layers on a decentralized basis. Even if these rules are observed, the danger remains that the top-level decisionmaker may be excessively attracted by the neatness of quantitative analysis and conclusions, and that he may neglect those parts of the analysis that are iffy, perhaps obscure, and certainly hard to evaluate. Even a practitioner like Charles J. Hitch, former Assistant Secretary of Defense, conceded this "potential hazard" in cost-effectiveness studies. One antidote, no doubt, is the development of effective models for qualitative analysis. But they will be very useful only if the top decisionmaker does not nurse a vulgar skepticism regarding noneconomic models, and if there is personnel with an adequate range of skills to design and work these models.

Indeed, excessive reliance on economists and other quantitative analysis experts is another condition that may cause the presentation of problems of choice to be slanted in favor of cost-effectiveness analysis that over-emphasizes money costs. It is not only that the cost-effectiveness experts do not necessarily command expertise on essentially military, political, and psychological problems; it is also that they tend to have acquired perceptual propensities more suited to some problems than to others. In this respect, it is interesting to note the praise lavished on these propensities by Hitch in his book, *Decisionmaking for Defense* (University of California Press, 1965). He approves of ". . . economic choice as a way of looking at problems . . ."; he lauds the "quantified common sense" of the systems analyst; and he remarks that systems analysis ". . . provides the checks and balances so essential to minimize parochial viewpoints. . . ." Hitch is quite right in extolling these virtues. Yet they are virtues only within the proper context; when pressed beyond, virtue can turn into vice. "Quantified common sense" may give short shrift to the analysis of intangibles, leading to deficient scenarios, and systems analysts could develop a parochialism of their own unless there are checks and balances—and I do not mean service

biases—to supplement their intellectual habits. Such checks and balances demand sophisticated personnel with a different range of expertise.

The proponents of cost-effectiveness studies admit that this management problem exists, although they express it perhaps more vaguely than I have done. Hitch avers that the dangers are known and hence controlled. But James R. Schlesinger has observed that “. . . a ritualistic recitation of the dangers of excessive quantification characteristically precedes the attempt to push quantitative analysis too far” (“Quantitative Analysis and National Security,” *World Politics*, 1963, 15, 306). This criticism may exaggerate, but the mere argument by the practitioners that the problem is under control will not do. The argument may be truthful or not. One must, therefore, insist that whether or not the dangers of cost effectiveness have been avoided and are avoided in the Defense Department is an empirical question that cannot be settled by argument. To convince me that they are avoided would require a thorough study of past problem-solving by impartial researchers. This could be done by a number of properly selected and properly conducted post mortems. I do not know whether such post mortems have so far been undertaken. If they have not, the determination with which the cost-effectiveness technique is applied to problems of great national importance makes it imperative that such studies be undertaken. To do so is in fact in the spirit of systems analysis.

There is another way of studying this management problem empirically. Psychologists could explore the relevant conditions that tend to slant the perception and prejudice the attention of policymakers and their assistants when confronted with highly complex problems of choice. I do not mean that decisionmakers should be psychoanalyzed. Experimental psychologists have already elucidated many of the conditions that affect perception and attention; it should therefore be possible for them to explore these problems within the context of our interest. How does the presentation of policy analyses—some quantitative and some qualitative, some based on solid information, and some on surmise—impinge on perception and attention? If such empirical efforts produced more knowledge than we now have, we would be in a better position to engineer improvements in the art of exploiting cost-effectiveness analysis. If this advocacy of fact-finding research strikes anyone as being superfluous, let me remind him of one thing we do know about human behavior, namely, that cognizance of a problem does not lead automatically to its solution.

A DANGEROUS APPLICATION

Now I will turn briefly to a review of our management problem with particular reference to choices in military research and development. The limitations on the usefulness of cost-effectiveness studies, and the management risks to which such studies give rise, are much greater when the cost-effectiveness technique is applied to research and development choices than to military choices in general. Clearly, to decide on a conventional aircraft carrier over a nuclear-powered carrier in 1963 was far easier than to decide at an earlier stage that a nuclear carrier should be developed.

In research and development choices, the uncertainties tend to be greater. As experience shows abundantly, financial costs are hard to estimate; technological advance is difficult to predict; and the benefits are hard to evaluate. After all, research and development outputs will affect military capabilities only after a considerable time lag and—during this time—the relevant military, technological, and political environment may undergo substantial changes that impinge on the value of a weapon system, or of a strategy for which it is designed. Above all, the capabilities of potential enemies may change significantly, in part perhaps as a result of their reaction to our research and development choices. Even the actual use to which evolving weapons will ultimately be put is hard to predict; history provides numerous examples of new weapons finding uses quite different from those which were originally intended.

The effect of these conditions that are hard to cope with will, of course, vary a great deal. It will tend to be the greater, the more research and development projects involve true innovation rather than marginal improvement. This proposition follows from the fact that the more innovation is involved, the greater will be the uncertainties. Their effect will also tend to be greater, the earlier the phase of research and development, again because the uncertainties are greater.

It is true that the cost-effectiveness technique is not applied at present to the earliest phases of research and development proposals—research and exploratory development—as long as the estimated costs fall short of a certain amount. The questions are whether the cut-off is well chosen and whether a fixed cut-off is in principle sound.

At any rate, if the enthusiastic practitioner of cost-effectiveness is apt to exaggerate the assistance his technique can give to the policy-maker, this is especially dangerous in the case of research and development choices. The worst danger would be if the insusceptibility of highly innovative projects to cost-effectiveness studies should lead to a bias favoring projects that were more susceptible. In the case of research and development proposals involving a high degree of innovation, it would seem more important to seek advice from people adept at making conjectures about the future military and political environment, and about the military needs which changes in this environment may generate. Only by doing so can we reduce consumer ignorance at the higher levels of decisionmaking where judgment is crucial.

I will repeat my plea for empirical studies of the values and dangers of cost-effectiveness guidance. Surely, to find out more about how to manage cost effectiveness is especially important with reference to military research and development. Indeed, the case for cost effectiveness would gain in strength if we learned more about the art of its application. If we did so, and particularly if we insisted on comprehensive cost-effectiveness studies, I would certainly conclude: let us have more of them.

[Letter to Editor-in-Chief, *Public Administration Review*, Vol. XXVII, No. 1, March 1967]

PPBS: TWO QUESTIONS

By Frederick C. Mosher

(Professor, Department of Political Science, University of California, Berkeley)

Dwight Waldo
Editor-in-Chief

Dear Dwight:

Over the last few years and particularly the last few months, I have been searching for "satisficing" answers to two questions about PPBS. First, what is really new and distinctive about it? Second, in what directions is it really influencing governmental decision-making and the conduct of governmental operations?

I was therefore particularly gratified to learn that *PAR* would devote a complete issue to PPBS, and I read all of it with unusual (for me) care and thoroughness.* It was a very good and rewarding issue. Yet I cannot honestly say that these articles resolved my questions; indeed, I am somewhat more confused now than before. Most of your authors, like others before them, differ among each other as to what PPBS really is; few of them say or predict what its real effects are or will be—beyond the confident assurance that decisions will be more rational, governmental operations more efficient (excepting, of course, Mr. Wildavsky's alarums from the wilderness of political science). I am in sympathy with most of PPBS and its constituent elements insofar as I understand what they are. In fact, I have been a supporter for about thirty years—ever since I took a course in budgeting taught by Bob Steadman in 1936. But apparently I have been missing some things. These are what I am searching to identify.

Mr. Greenhouse's article on "Planning-Programming-Budgeting System: Rationale, Language, and Idea-Relationships" is described as particularly aimed at "distinguishing it (PPBS) from earlier management systems", so his piece seems an appropriate point of departure. Greenhouse advises us that PPBS has two basic ingredients which distinguish it from what has gone before. The first is a new and different concept of accountability. The second consists of a set of eight terms and expressions, none of which is new according to Mr. Greenhouse, but their rearrangement provides them "subtle differences of flavor and shade" which renders the totality distinctly different and new.

The more intriguing of these two ingredients of PPBS is the first one, accountability, since most of the literature on the subject has been singularly devoid of concern about accountability. Greenhouse advises us that, under the PPBS concept, each agency is primarily account-

*Planning-Programming-Budgeting Symposium. *Public Administration Review*, December 1966. Vol. XXVI, No. 4., pp. 243-310.

able to the President (and Congress) "for the distribution of these goods and services to the American people." Before PPBS, he says, agencies were accountable to provide "administrative support" to the President (and Congress). This seems to me a singular interpretation of agency accountability prior to PPBS, whether it is construed as a description of legal and formal accountability or of attitudinal and behavioral accountability. It is the more extraordinary coming from an official of the Veterans' Administration where many of us have thought, and some have deplored, that for many decades the primary accountability was to the veterans (and their organizations) for the "distribution of goods and services to (a sector of) the American people." If, as Mr. Greenhouse says, PPBS hinges on this "new" concept of accountability, it is strange that the source and fountainhead of PPBS practice and experience—indeed to this date almost the only example—is the Department of Defense where it was applied primarily to the fashioning of weapon systems for possible delivery to potential enemies of the American people. While the protection of the American people is perhaps the principal objective of Defense, the distribution of protection does not seem to have been a determining and underlying concept in the development of PPBS with regard to weapons.

The eight distinguishing terms of PPBS, according to Greenhouse, are: "objectives, programs, program alternatives, outputs, progress measurements, inputs, alternative ways to do a given job, and systems analysis". I find few "differences of flavor and shade" in Mr. Greenhouse's discussion of these terms. The objectives-plans-programs-operations-measurements sequence is very "old-hat" among budgeteers and among scholars. His extension of the meaning of objectives to "market objectives" seems a rather curious perversion of the word market,¹ but the idea is an old one to students of government and administration. I find little to debate in Mr. Greenhouse's definition of PPBS "programs," bearing in mind, as he asks us, that "*this* idea of program is very different from the traditional governmental usage." I would bear in mind too that the "traditional usage" has been repeatedly challenged over the past sixty years with a great deal of success in some areas, well before "PPBS" was coined. Unless I am mistaken, the PPBS definition of, and concentration upon, programs has been standard doctrine in the literature about, and the teaching of, budgeting since the thirties. And, so far as I can recall, there is no essential change in the meaning of "program" and its identification with objectives from what I was taught then.

Dr. Hirsch, in his "Toward Federal Program Budgeting," is less explicit in distinguishing the elements of PPBS.² He argues that it "should help overcome some of the major shortcomings of the existing administrative budget, where budgetary requests are presented in line-item form—personnel, supplies, maintenance, etc." The drive against the line-item and toward more programmatic appropriations, presentations, justifications, and thinking has been pushed for a good

¹ My impression is that a market is a place where things are bought and sold, and that economists and others have usually distinguished the "market economy" from the "budget economy."

² Assuming that his use of the term program budgeting, like that of his colleagues who wrote the book by this title, edited by David Novick in 1965 (Harvard University Press), is intended to mean the same as PPBS, as the term is currently used in Washington.

many decades both by budgeteers and by budgetary reformers. As a matter of fact, great progress toward this objective was made during the decade following World War II and partly in consequence of the first Hoover report (which made a very similar statement). If, as Dr. Hirsch suggests, the major shortcomings of Federal budgeting reside in the fact that "budgetary requests are presented in line-item form," it is at least interesting that the presentation of the Defense Department in the President's Budget has changed in no material way since 1961 and still accords with the cost-category structure instituted a decade and a half ago under the direction of then Defense Comptroller Wilfred McNeil. Program budgeting has apparently gone on *behind* the formal presentation in Defense, and one wonders whether its essence may not have been going on behind the formal presentations of a good many other agencies. How significant a test is the formal presentation?

I find little else in Hirsch's article which would distinguish PPBS, or program budgeting, from what had been urged, and in some places practiced, before 1960. The McGilvery article on "A Management Accounts Structure" presents an integrated control and classification system which would be useful for PPBS—or any other kind of budget system. This piece seems to be on quite a different level of concept and organization from most of the literature on PPBS. Banks and Kotz, in their discussion of "The Program Budget and the Interest Rate for Public Investment" present a very convincing argument on the importance of the interest rate in the calculation of costs and benefits in public expenditure programs.³ The theme would of course apply to budgetary analysis long before the term PPBS was invented.

My own guess is that PPBS has made significant contributions to budgetary concepts and potentially to budgetary practice in providing not new ideas but new emphases. These include its emphases upon alternatives, upon cost-benefit analysis, and upon the reexamination of objectives and what should be done about them—i.e., programs. It has provided Presidential support, and in a few cases, departmental support for the intensive analysis, utilizing whatever analytical tools are available, of public—and therefore budgetary—problems. PPBS has made more respectable—indeed more mandatory—the application of the newer techniques of computerization of quantitative data to public decision-making. It has laid new stress on the assessment of outputs against inputs and therefore on the evaluation of effects of governmental programs, as far as possible quantifiable. It has encouraged a longer-range view—three or five or ten years—beyond the one-year budget projection, though this is by no means a new idea or practice. And it has fostered and given respectability to intensive analysis of programmatic and budgetary problems in depth, taking into account both costs and benefits. In these various ways I would hope that PPBS will contribute significant accretions to rationality in the budget process. The goal is not new any more than are the means. But PPBS has brought a sudden and unexpected Presidential push about which none of us should quibble.

These are guesses and hopes. Opposite them I would pose some other guesses and fears. First among these seems to me, generously, the ignor-

³ An argument also stressed in the article by Dr. Willdovsky.

ing of, or less generously, contempt for, democratic values and processes. In all the literature I have read about PPBS, including your recent *PAR* issue, only a very few authors have even mentioned the executive and legislative processes of review and decision.⁴ The President and Congress seem to be regarded as enemies of rationality. Dr. Hirsch raises a variety of value-loaded questions such as: "Have we the right mix between the budget for U.S. military forces and the other national security activities?" and: "Should the Federal Government spend only \$1.4 billion on primary and secondary education?"⁵ Who is to answer such questions? An analyst? Or are they to be answered through normal budgetary procedures, enlightened as far as possible by studies of analysts? At no point does one gain the impression that the budget process is a "due process" of administration wherein the facts, the analyses, the interests, the politics and the prejudices of people enter. Much of the literature of PPBS resembles that of the technocrats of the thirties; its aim seems to be to eliminate *politics* from decisionmaking. I hope that some apostle of PPBS may soon draft a rationalization of the system with political democracy. I think this can be done but not in the technocratic and authoritarian language we have seen to date.

My second reservation about the literature on PPBS—and some of its practice—is the apparent lack of sophistication about organization and administration. Perhaps I am underrating the proponents; maybe they know (and intend) that their efforts will shift decision-making power from one group to another, from one level to another, however much some of them prefer to describe their system as "politically neutral." I am grateful to Dr. Wildavsky for his penetrating discussion of program budgeting as "system politics," though I am less concerned than he regarding the possible dire consequences of "unlimited efficiency," perhaps because of my faith, which may be naive, in checks and balances, in competition among bureaucracies, in political executives, and in the Congress. While PPBS is avowedly intended to improve decision-making, there has been surprisingly little treatment of *who* would or should make the decision. In fact, the potential effects of PPBS on power distribution within the government are surely as important as the technical improvements which are hoped for it. Most of the government lacks the "unitaryness" of the Defense Department where the decisive power of the Secretary was enhanced by PPBS and at the same time contributed assurance of authoritative treatment of PPBS findings. But this is hardly possible in fields like education, foreign affairs, natural resources, and many others. Will PPBS move all program decision-making in these fields up to the Budget Bureau or the White House? Is this its intent?⁶ Secondly, what will be the relationship between the budget analysts and the decision-makers? Will this new style of experts be on top or on tap? Thirdly, what will

⁴ The very few include Arthur Smithles and George A. Steiner in their articles in the Novick volume, cited earlier, and Aaron Wildavsky in the *PAR* issue.

⁵ This question is not only value-loaded. It is stacked by the word "only." "When did you stop beating your wife?"

⁶ A major effect, whether or not intended, of budgetary reform for the last six decades has been to raise to a higher level the power to make or influence decisions, to choose among alternatives. This was certainly a consequence of performance budgeting in the Army and Navy 15 years ago, whereby the central staffs assumed more effective control over the arms, services, and bureaus of their departments. It was certainly also a consequence—perhaps the most important consequence—of PPBS in Defense during the early sixties whereby the Secretary gained greater control over his subdepartments and the military services.

be the relationship between the program budgeteers and the old-style budgeteers, who deal with such mundane problems as line-items and presentations to higher levels and Congress? And what will be their relationship with the existing, usually professionalized, offices of programming and planning which one finds in most of the Federal bureaus?

Dr. Hirsch states that more than 40 Federal agencies are engaged in educational activities. I understand that over 50 are engaged in foreign affairs. Comparable numbers are involved in other major governmental efforts (or programs): natural resources, transportation, urban development, etc. One reads vague expectations in the PPBS literature that agencies will be reorganized to accord with programs. While some reorganizations in this direction would undoubtedly be helpful, the objectives of different organizations will inevitably cross over into others, however they are defined; all have multiple purposes. All have, and inevitably will have, their own committees and subcommittees in Congress, including the appropriations subcommittees. How then to develop rational program budgets? I pose these questions not as unanswerable or insoluble but as questions that many apostles of PPBS have conspicuously neglected. Who is to seek answers to the many questions that Hirsch and others have raised? And, more important, who is to make decisions about them?

My third fear about PPBS arises from its lack of "historicism." I can find no better word than this slightly obsolescent one to depict an ignorance or deliberate rejection of historical precedents and an absence of recognition of developments over a considerable period. The article by Allen Schick on "The Road to PPB" provided a particularly valuable historical perspective, conspicuous by its absence in most of the writings on the subject. The majority would have us believe that PPBS has come to us as Aphrodite from the sea, full-blown, fresh, beautiful, and topless. Dr. Hirsch advises us that the early beginnings came in World War II in the War Production Board and that David Novick developed the concept in the mid-fifties. The expression "program budgeting" goes back a good many decades. As you know, I wrote a book in 1954 with this title and I believe with the same theme—the rational relating of objectives, plans, programs, and budgets. Since World War II, there have been innumerable articles and monographs on the subject—local, state, national, and international. As indicated above, I am still searching for the differences in concept between the Novick-Rand-Defense PPBS and the traditional idea of program budgeting which goes back several decades. My own questions about the meaning and the significance of PPBS perhaps arise from the lack of historicism of most of the writers on the subject. It is hard to point up what is new if one does not know or does not acknowledge what has gone before.

I hope that PPBS may not grow and blossom and fade as some other management "fads" have because of a failure to synchronize it with the development of our society, orientations, and experiences. I hope that the 90, more or less, Federal employees now training for PPBS in various universities (and the 150, more or less, next year) may learn enough about public administration and politics that they are not completely frustrated when they return to their jobs. I hope that we not oversell this thing; that we keep our feet on the ground; that our

political-administrative system may be educated as far as possible with rationality but that economic rationality may not overtake political and administrative responsibility. If my understanding of the meaning of PPBS is near the mark, let us have it but only in terms that are consonant with the ideals of American politics, administration, and democracy.

Sincerely,

FREDERICK C. MOSHER,
University of California, Berkeley, Calif.

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ORIGIN AND HISTORY OF PROGRAM BUDGETING

By David Novick*

(Head, Cost Analysis Department, The RAND Corporation)

For the next half-hour, I shall be talking about the origin and history of program budgeting as part of the Civil Service Commission's orientation and training courses for the Planning-Programming-Budgeting System (PPBS) which was introduced by the Federal Government in August 1965. The occasion for this can be viewed from two angles: First, the intellectual or scholastic one that claims people do a task better when given an understanding of the background and roots of the process in which they are engaged. The other, and probably the more appropriate one, is to try to deal with comments that have been made from time to time about the Planning-Programming-Budgeting System either as something brand new or something that is specifically designed for application to the military or Defense Department activities.

As I hope to indicate over the next half-hour, the program budget has a rather ancient and hoary origin and it did not start in the Department of Defense. There are two roots of this concept and method: one in the Federal Government itself where program budgeting was introduced as part of the wartime control system by the War Production Board in 1942; the other root—an even longer and older one—is in industry. To be honest with you, I don't really know precisely when or how the program budget was introduced in business.

In 1959, after I had been writing about PPBS for more than five years, I had a visitor who said he had only recently become familiar with my proposals, and on reading the material he thought I'd be interested in his experience along the same lines. He gave me a set of written documents—General Motors' Budget and Finance Procedures for the Year 1924.

The visitor was Donaldson Brown, who had retired as chief financial officer of General Motors and who was until his death a member of the board of directors of DuPont. According to Mr. Brown, by

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the time that DuPont made its investment in General Motors, DuPont was already using something very much like a program budget system. And, this way of planning and budgeting was one of the major innovations in General Motors after the takeover.

Let me start by talking about the part of the origin that identifies to the Federal Government because this is the one in which I was closely involved and with which I therefore have a greater familiarity.

In the early summer of 1940, President Roosevelt created the National Defense Advisory Commission which was to assist our friends or "allies-to-be" in facilitating their war efforts. To do this, we undertook a variety of new or expanded production efforts and a number of new construction projects. In all of this, the building of ships and shipyards and the construction of new factories, one item of demand was common—overhead cranes.

As a result, by late 1940 the first of what was to become our World War II controls was introduced—a limitation order controlling the schedule of distribution and use of overhead cranes. This was followed over the next year and a half by a series of orders that copied the pattern of control of industrial production and distribution that had been used in World War I.

There was a limitation order dealing with aluminum as the aircraft demands made this metal in short supply. There were orders dealing with various alloying materials, as hard steel demands for military equipment increased. There were orders stopping the production of pleasure automobiles to cut back the use of materials like chromium and components such as ball bearings, and so on. The result was that even before the war had started, by the summer of 1941 we had a real traffic jam in our control system.

The military were using authority that had been given them to place priorities for deliveries of finished products such as tanks, aircraft, ships, and the like. The civilian supply agency also was authorized to place priorities on steel, copper, aluminum, and other materials for milk pails, medical and hospital supplies, and other essentials.

There were a great many priorities and these priorities soon started to outstrip the available supply. As a consequence, it became apparent that this way of doing business—separate controls for each situation—was not likely to work. In the early fall of 1941, a scheme which I developed—the Production Requirements Plan—attempted to deal with the priority and allocation problem on an across-the-board basis. Shortly after Pearl Harbor, this was made a mandatory nationwide system.

However, the Production Requirements Plan had been designed as a stopgap measure. That is, recognizing that the military did not know what was required to build their ships and planes and tanks, and did not have a schedule that could identify delivery in appropriate time periods, and did not have a way of effectively controlling the dollar volume of contracts placed, there was one essential need—to identify these fundamentals.

The Production Requirements Plan was designed to identify the material and component requirements for contracts that were being placed by the military, and probably more importantly, to measure the inventories and capacities of America's producing industry. It

was an interim step on the road to a program budget in that it provided the first overall picture of the United States needs and resources for war.

From this we learned that we could not look at one thing at a time, be it airplanes, ships, or stainless steel milk pails on the demand side; or steel, aluminum, overhead cranes, and ball bearings on the supply side. As a consequence, by early 1942, the War Production Board was looking at the total of military requirements and the total of war-essential civilian requirements in terms of a series of identifiable groupings; and, perhaps more significantly, these groups were being studied by the analytical tools then available.

The essential features of the situation can be made rather simple. Although we needed all the airplanes that we could get, all of the airplanes were not that important. At some point, roller bearings for the 2,000th B-17 were less important than the roller bearings for a refrigerator in a municipal hospital. At some point, the 1,000th tank of a certain type was less important than the stainless steel milk pails essential for milk to be supplied to either soldiers or civilians. As a consequence, the War Production Board learned the need for weighing and evaluating, and this led to the introduction in late 1942 of the Controlled Materials Plan.

The Controlled Materials Plan is to my mind the first program budget used in the Federal Government. It usually is not so identified because the budgeting was done in terms of copper, steel, aluminum, and other critical material rather than dollars, and for most people budget is associated with dollars. However, in choosing the media of exchange—copper, steel, and other critical items—we were recognizing that in 1942, dollars were less meaningful than physical resources. Currency could be created by fiat and without restraint, whereas materials of the type labelled as controlling were limited in quantity and their supply could only be increased by a slow, and usually resource-demanding, expansion.

As a consequence, for the balance of World War II—that is, from 1943 through 1945—we effectively controlled the system of production in the United States and the distribution of output from that system through the Controlled Materials Plan, which was the first Federal program budget. I call it a program budget because it had the following characteristics:

I. Identification of major goals.

- United States or allied combat needs
- Essential civilian requirements
- Other essential military or civilian demands
- Aid to friendly nations
- Economic warfare

II. Each major goal was identified in program objectives; for example:

A. United States Military

1. Combat theater equipment and supplies
2. Combat support
3. Zone of interior activities

- III. Program objectives were further defined in program elements, for
1. Combat theater equipment and supplies
 - (a) aircraft
 - (1) (further defined by type and model)
 - (b) tanks
 - (1) (broken down into size and purpose categories)
 - (c) automobiles
 - (1) (identified as trucks, jeeps, personnel vehicles, etc., and trucks further refined into size and use categories)
- IV. Programs crossed service lines so as to identify land, sea, and air forces as well as essential nonmilitary contributions to identified objectives.
- V. There was an extended time horizon. A budget was prepared every three months or quarter and it was projected for 16 periods, that is, the next quarter and the 15 succeeding ones.
- VI. Alternatives were examined and systematic analysis was made of both supply and requirements. Sometimes this meant resources were augmented by stopping production; the outstanding example: gold mining. This provided additional labor and equipment for other mining activities. In other cases, essential needs were met by “freezing” inventories and controlling distribution as was done in the case of passenger automobiles. In every case, the action was the result of analysis.

Our systematic analysis was not necessarily systems analysis in the breadth and depth we now identify to such studies; but under the Controlled Materials Plan we did cost-effectiveness analysis even if it did not have the sophistication which we expect today. However, in terms of the state-of-the-art of the time, I think the analytical and related methodology used in our World War II Controlled Materials Plan can be properly identified as a program budget.

The next steps in the federal development of a program budget took place in the Bureau of Reclamation, the Coast Guard, and some few other government agencies, and at RAND. I shall detail the RAND activities.

Early in its history, RAND decided that the traditional standards for choosing among preferred means of warfare of the future—for example, for aircraft, higher, faster, more payload—were not the only ones and so expanded the criteria into what is now known as *weapons systems analysis*. The first of these studies was completed in 1949 and in it a number of new factors were introduced—e.g., social, political, and economic—so that the study aims went beyond what the specific piece of equipment would do, and added considerations such as demands on the U.S. economy, and impact on the economy of the enemy. With the wide range of considerations in systems analysis, it was de-

terminated that there was only one way to bring this heterogeneous group together, and that was with the common denominator of the dollar.

At that time, RAND looked to the Air Staff for its data, and the dollar data were made available in the traditional form; that is, budget and financial information in terms of equipment, construction, personnel, and the like. Although there had already been some efforts in the Air Staff to develop a means for looking at weapon systems, these had not proceeded very far and as a consequence the traditional budget and financial data were something less than satisfactory for weapons systems analysis as developed at RAND.

If one wanted to do a systems analysis in which there would be a comparison between various types of bombers—for example, the proposed B-47 and B-52 and the existing B-36, B-29, and B-50—the data just were not available. When RAND decided that it would have to engage in a more detailed analysis of the economic requirements of the proposed weapons systems, it became necessary to examine in considerable detail the available sources of information.

After several years, it became apparent that these would not provide the answers if they were maintained in the existing and traditional form. As a consequence, in 1953 there was a RAND publication¹ proposing the first program budget to be applied to the Air Force. It also suggested that the methodology could be extended to the total of military activities.

The Air Force accepted this document with something less than complete enthusiasm, and as a consequence the idea was kicked around for many years. Let me say as an aside that although the Air Force did not endorse the idea, it also did not prohibit, or in any way interfere with, RAND continuing to expose the concept. The consequence was continued study and publication at RAND of ideas which we now associate with the program budget. This led to a culmination in 1960 in two documents—one, *The Economics of Defense in the Nuclear Age*;² the other, *New Tools for Planners and Programmers*³—which were brought to the attention of persons in the incoming Kennedy Administration who generally agreed that this might be one way of facilitating the treatment, analysis, and study of one large segment of the United States budget, namely, the military components.

And, as you know, in 1961 the initial effort was launched in the Defense Department and it has continued since that time. Program budgeting in the Department of Defense has been the subject of various types of criticism. Maybe I'm prejudiced, but to me most of it sounds very complimentary.

Turning again to the historical stream, as indicated at the outset, I really don't know when the DuPont Company came up with the idea of a program budget. However, as indicated earlier, they introduced their concept into General Motors in the very early 1920s. The important thing, I think, from our point of view, is that whether we're thinking of the application in industry or in government, we all have one

¹ Novick, D., *Efficiency and Economy in Government Through New Budgeting and Accounting Procedures*, The RAND Corporation, R-254, December 3, 1953.

² Hitch, Charles J., and Roland N. McKean, *The Economics of Defense in the Nuclear Age*, A RAND Corporation Research Study, Harvard University Press, Cambridge 38, Massachusetts, 1960.

³ Novick, D., *New Tools for Planners and Programmers*, The RAND Corporation, P-2222, December 1960.

common objective in the Planning-Programming-Budgeting process. That is not just to identify resources for administrative purposes *per se* in terms like real estate, equipment, personnel, supplies, and so on.

The PPBS method is to set forth certain major objectives, to define programs essential to these goals, to identify resources to the specific types of objectives and to systematically analyze the alternatives available. I think this may be made more simple by illustrating it in automobile industry terms. For example, at General Motors it means not only dividing up between Chevrolet and Cadillac divisions and the other major lines that General Motors produces. It also means within the Chevrolet line, identification of objectives in terms of price classes, categories of cars that they are trying to sell, and setting up specific programs for each of them. Then they calculate the resources required and the potential profits and losses under various conditions.

Now the word "potential" immediately introduces one of the major factors in the program budgeting system. That is, that we are dealing with uncertainty. In the typical budget proposal, we usually look at a relatively short period of time—that is, one year—and in handling that, we assume that we have complete confidence and knowledge about what will transpire.

As all of you know, the truth of the matter is that even within as short a span of time as a year, things happen and events do not work out exactly as planned. As a consequence, even then there is an element of uncertainty. One of the major features of the system that was introduced in Detroit was the fact that they were not planning just for next year's automobile, and had to deal with uncertainty in terms of four, five, or more years in the future.

In the current time period, next year's model or the automobile for year I is a fixed thing with only a little possibility of change. The article for the year after that or year II, is almost a fixed thing because commitments must be made to long lead-time items as much as 18 months in advance. Even the automobile for year III is fairly well developed at this point in time and they are also planning for automobiles for years IV and V.

In other words, Detroit continuously has five model years in planning, as well as one model in production. And, they look at all of these in terms of all of the possible alternatives with respect to market conditions, the kinds of competition that they will be facing, the changes in income for their customers that can be projected, and the like. And this leads to a broad range of studies or systematic analyses. In addition and on top of this, they are at the same time treating of the capital investment program, because by and large they cannot make capital investments for an automobile more close at hand than year VI. In fact, if a change requiring investment in new plant is to be made for an earlier period of time, they must take into account the tremendous upset and additional costs that will be involved.

I hope that this rather generalized illustration of the way in which automotive planning, programming, and budgeting is done, gives you a better feel for just what is done in the system developed and used in Detroit.

Let me digress a moment, because although I didn't identify it, the concept of systems analysis, which again is closely identified with program budgeting, did not really originate in program budgeting *per se*.

Systems analysis always has been a part of the work of competent engineers and engineering firms. Probably the greatest innovations in systems analysis were initiated in the 1920s in the Bell Laboratories. Actually, in many respects the Bell Lab's method of analysis then and today bears a close resemblance to what we called "weapons systems analysis" in the Defense Department or in other organizations such as RAND.

There is one major distinction and I think it is worth noting. That is, that the engineers (and this includes the Bell Laboratories) oriented their thinking largely, and sometimes exclusively, to the hardware or the equipment considerations.

Although they sometimes introduced economic, social, and political aspects, they treated these in a very primitive way. And I think the great significance of the change that we call weapons systems analysis today is the broadening of both the nature and content of the analysis.

In all of this, quantitative aids are of great importance, and we want to quantify as much as we can. But as has been stated repeatedly by Mr. McNamara; by Mr. Hitch, when he was Assistant Secretary of Defense (Comptroller); by Mr. Enthoven, the first Assistant Secretary of Defense (Systems Analysis); computers and quantitative methods are not decisionmakers. They are, instead, aids to the decision-making process. They are aids in illuminating the issues. Today, I think most of us realize that we are not talking about computers as the decisionmakers in the PPB process. In fact, I think we realize it is "Anything But."

In fact, it is recognized that as important as, and in many cases more important than quantitative considerations, are problems of a qualitative nature for which we do not have numbers. This does not mean that analysis is not possible just because we cannot quantify. On the contrary, there are many ways of analyzing qualitative problems and it is an essential ingredient of this process that we undertake to do a substantial amount of qualitative analysis in addition to the quantitative work.

As you all know, and the reason that we are here is that in August of 1965, President Johnson said that this system which has been so successful in the Defense Department was now to be applied to all the executive offices and agencies of the United States Government. Even though there is a long history of program budgeting, even though it originates outside of the federal establishment, even though there are some 25 years or more of history that we can identify to the activity within the federal establishment, the truth of the matter is that the problem that we are now facing—that is, the application of the PPB concept to new areas of interest—is a new and very difficult one. And, one of the major problems is that of identifying the missions, the objectives, or the goals, not only of the federal establishment as such, but of each of the offices and agencies which make up the total of the executive department.

I think our Planning-Programming-Budgeting System offers all the advantages that President Johnson set forth in his 1965 announcement. It will be up to you and the others who are working on the problem in the federal establishment to give us as a nation the benefit of this new way of doing business.

[Excerpt from testimony May 11, 1966, hearings, "Department of Defense Appropriations for 1967", Subcommittee on Department of Defense, House Committee on Appropriations, 89th Congress, 2d session, part 6]

COST-EFFECTIVENESS STUDIES

By Vice Admiral H. G. Rickover

(Deputy Commander for Nuclear Propulsion, Naval Ship Systems Command; and Director, Division of Naval Reactors, U.S. Atomic Energy Commission)

CHANGE FROM SAIL TO COAL

I suppose, to some people, any rate of transition to nuclear power is an unreasonable rate. It might interest you to know that it took two-thirds of a century for the Navy to shift from sail to steam. In 1814, Robert Fulton designed and built for the U.S. Navy the world's first warship propelled by steam. It was named *Demologus*. Over the next 20 years, the merchant marine built some 700 steam merchantmen. However, during that period the Navy built only one additional steamship.

In 1869—55 years after the *Demologus*—the Navy Department issued a general order requiring all warships to carry a full set of sails. The concern over cost was so great that very specific instructions were written as to when the steam engines could be run and the general order warned naval commanders that:

They must not be surprised, if they fail to carry out the spirit of this order, if the coal consumed is charged to their account.

CHANGE FROM COAL TO OIL

In a later period, there was great reluctance to shift from coal-fired to oil-fired boilers in warships. At the beginning of the 20th Century, it was accepted generally that oil-fired warships offered great military advantages over coal-fired warships, but they were more expensive. It took Sir Winston Churchill's command decision as First Sea Lord to give Britain's Royal Navy the position of world leadership in converting warships from coal to oil. As it later turned out, this was a significant factor in Britain's naval superiority in World War I. The British Admiralty had built oil-burning destroyers as early as 1908, but, as Sir Winston is quoted as saying at the time:

Shocked at the expense, [the Admiralty had] reverted for 2 years to 27-knot coal-burning flotillas. I was too late to stop the last bevy of these inferior vessels, but I gave directions to design the new flotilla to realize 35-knot speed without giving up anything in gunpower, torpedoes, or seaworthiness. I proposed to the board that if the money ran short, we should take 16 of these rather than 20 of the others. Building slow destroyers! One might as well breed slow race horses.

Mr. FLOOD. Even coming from the coal fields, I agree with you. That is going pretty far.

Admiral RICKOVER. Yes, sir.

CHANGE FROM OIL TO NUCLEAR POWER

Mr. Chairman, I agree with the statement in the letter of November 10, 1965, from the Chairman of the House Armed Services Committee to the Secretary of Defense, printed on pages 53 through 55 of the Joint Committee report that:

The argument used against building nuclear-powered warships is the same argument used a decade ago by those in positions of authority who did not want to go to nuclear power in submarines because they cost more, by those in authority a half century ago who did not want to convert from coal to oil for naval warships, and by those a century ago who did not want to shift from sail to steam. The argument against obtaining improved capability in warship propulsion because of its higher cost is just as fallacious today as it was a hundred years ago.

The United States is spending large sums of money to provide quicker military response—such as use of expensive airlift. But when nuclear power is advocated there appears to be a predetermined built-in-bias against it, a bias which has been maintained for many years and which has been overcome slowly and only after actual experience, including war situations, shows the opinions of the cost-effectiveness people to be wrong.

COST EFFECTIVENESS

The cost-effectiveness people have created the illusion that they are capable of relating cost to military effectiveness by scientific analysis. In actual fact, they are just as reluctant to change preconceived opinions as they accuse the military of being. Knowledge of an esoteric mathematical ability does not of itself insure wisdom or judgment. The issue of nuclear power has amply demonstrated this.

Mr. FLOOD. You mean knowledge is not necessarily wisdom. You have to distill it.

Admiral RICKOVER. That is right, sir. Knowledge gives one the potential to acquire wisdom.

CALCULATION OF MILITARY EFFECTIVENESS

The basis for using cost-effectiveness studies as the rationale on which to make a decision is the assumption that the important factors can be expressed in numerical form and that a correct judgment of the situation can then be calculated mathematically. But for most complex situations this is an unrealistic assumption. Frankly, I have no more faith in the ability of the social scientists to quantify military effectiveness than I do in numerologists to calculate the future.

Many people are mesmerized into believing that a study which is based on computer calculations must be correct since it uses the most modern mathematical techniques. They are led to believe that the results are equivalent to scientific proof. This, of course, is just not so.

I daily face difficult scientific and engineering problems, the resolution of which requires melding together experience, intuition, judgment, and experimental testing, as well as the results of complex computer calculations. In my technical work one of the most important issues I face is the determination of those things which are properly subject to numerical analysis and those things which are not. Any mathematical calculation can only produce results within the frame-

work of the assumptions upon which the calculation is based and even within this framework is only as accurate as the numbers assigned to the various factors involved. The calculation results cannot take into consideration factors which are eliminated by the original assumptions. Faulty assumptions will produce faulty answers. Incorrect data will product incorrect results.

Because of the highly developmental nature of naval nuclear propulsion work, we have in our laboratories the most advanced computers available in the world today. To carry out this complex technical work, we utilize the talents of a large number of mathematicians, scientists, and engineers of the first rank. But I want to emphasize the point that whether numerical calculations are done by hand or on a computer which can perform approximately a million operations per second, the numerical answer will be the same—the difference is the length of time it takes to compute the results. No matter how advanced a method of calculation is used, the numerical answer cannot be any more accurate than the assumptions on which the calculation was based and the accuracy of the data available for inputs to the calculation.

In my work, hardly a day goes by without experience in our test programs and operating plants revealing that the results of many of our computer studies are not correct; had we based our engineering decisions solely on the computer study results, our nuclear powerplants would not work.

In my opinion, the ability of the social scientists to calculate numerical values for military effectiveness is even less than our ability to calculate a numerical basis for many of the engineering decisions we are forced to base on judgment, experience, and intuition. To make the correct engineering decisions requires extensive knowledge and experience in engineering. Mathematical ability alone will not suffice.

It is my impression that the Navy's rationale for nuclear propulsion in surface warships is ignored because we do not compute a quantitative value for the increased value of military effectiveness nuclear propulsion provides. We point out the specific military advantages of nuclear propulsion and relate them to specific experience in war. However, we do not provide a calculated numerical value for the increased effectiveness.

In the cost-effectiveness studies performed by the analysts, they compute numerical values for the effectiveness of nuclear power. However, before they make the calculation, they make certain simplifying assumptions in order to be able to do the arithmetic. These assumptions just happen to eliminate from consideration the principal military reasons for wanting nuclear power in the first place. The analysts generally start their calculations with the assumptions that oil for the conventional ships is readily available whenever and wherever it is needed, and that the logistic support forces will not be subject to attack.

Now, if the Navy could be assured that they would not be asked to perform missions where it would be difficult to get oil to our ships, there would be less need for nuclear propulsion. However, the Navy cannot afford to count on such a euphoric situation, since the history of war is replete with examples of major military defeats that were brought about by the inability of military forces to maintain a supply of propulsion fuel to the forces in combat.

With the marked increase in vulnerability of logistic forces that has come about since World War II and with our inability to really count on advanced bases needed to support our worldwide logistic complex in the years ahead, you can see that the assumptions used by the analysts to simplify their calculations may well not be realistic. I doubt that the low numerical values calculated by the analysts for the military effectiveness of nuclear propulsion in surface warships are any more meaningful today than the absurdly low values that were calculated by the analysts in the early 1950's for nuclear submarines.

CALCULATION OF COSTS

One cost-effectiveness study after another has been produced on nuclear propulsion for surface warships in which extensive calculations have been made of the various costs involved. For one set of assumptions nuclear power is more expensive; for another set of assumptions, which considers the cost of providing and protecting logistic support for the conventional force, nuclear-powered ships are shown to be less expensive. Studies which assume the distance to the combat zone and the length of the resupply lines to be short, assume our forces are not subject to attrition and assume that propulsion fuel is readily available, conclude that nuclear propulsion does not offer great advantages. However, other studies show that when distances are great and propulsion fuel is hard to get, nuclear propulsion is much more effective than conventional propulsion. Relative effectiveness in these studies is "measured" by comparing "quantifiable" factors in a prescribed "scenario." Relative costs in these studies are calculated on a peacetime construction and operating cost basis which does not allow for any attrition to our forces.

Even so, numerous cost-effectiveness studies have shown that the overall construction and operating costs of nuclear-powered surface warships are very close to the overall construction and operating costs of conventionally powered ships. The higher initial cost of nuclear ships is counterbalanced by the cost of the very complex propulsion fuel distribution system required for conventional ships. And the nuclear warships have much greater military effectiveness.

Endless hours of many peoples' time have been spent arguing over the assumptions used in the cost calculations, and the study cost results have seesawed back and forth between the nuclear being more expensive and the conventional being more expensive, according to the particular assumptions used in the cost calculations. *Far more emphasis has been placed on determining the cost than on studying the military effectiveness. All factors of military effectiveness for which the analyst cannot calculate a numerical value have automatically been discarded from consideration.*

Frankly, I am amazed that so much effort is being placed on these detailed cost calculations. Many of them are based on unrealities. It has already been established through numerous studies that the overall cost of nuclear propulsion for surface warships is about the same as the overall cost of conventional propulsion. The differences in cost calculated by any of these studies are far less than the errors inherent in the oversimplified assumptions used in the calculations.

The danger of continuing to make these extensive cost analyses of nuclear versus conventional propulsion is that it diverts attention from the real issues that should be considered in making the decision to go or not to go to nuclear propulsion.

UNPREDICTABILITY OF WAR

All wars and all military development should have taught us that:

1. A war, small or large, does not follow a prescribed "scenario" laid out in advance. If we could predict the sequence of events accurately, we could probably avoid the war in the first place. The elder Moltke said: "no plan survives contact with the enemy." Are we not relearning that bitter lesson every day in Vietnam just as we have learned it in every other war since the beginning of man?

2. When a war starts, we fight with what we have. You will recall that all aircraft used in World War II had been designed prior to the war. Also remember that it takes 4 to 5 years to build a large warship.

3. Our weapons are used to the greatest effectiveness possible under the circumstances in which they are employed. This often means using them for an entirely different mission than that for which they were designed. For example, look at the use of B-52's in Vietnam today. *Every major weapon should be designed with the maximum possible inherent flexibility.*

It is the need for flexibility in warships built to operate for 30 years or longer that makes it so obvious we should use nuclear propulsion in every major surface warship we build. You should remember that the ships we are building today are expected to last through part of the 21st century.

DANGEROUS ASSUMPTIONS USED IN STUDIES

Cost effectiveness studies may assume that for the rest of this century we will have adequate advance bases from which to operate our conventional forces. They may assume that we will have no trouble maintaining a logistic supply line at sea. They may assume that our forces will not be subject to attrition. They may assume that we will not need sustained high speed endurance in our warships. They may assume all these things, but they cannot insure them or in fact do anything to bring them about. Cost effectiveness analyses do not give consideration to factors such as these since the "scenarios" are based on the assumption that the advanced bases are there, that there will be no losses to our forces, that there will be no problem in delivering propulsion fuel, etc. Once these assumptions are made, the possibility of these situations arising are removed from the decisionmaking equation.

Perhaps one can gain knowledge that would help make a correct decision on nuclear propulsion by studying at length the cost effectiveness studies on nuclear versus conventional propulsion, which piled on top of each other are several feet thick. My personal belief is that the following statement from the foreword of the recent Joint Committee on Atomic Energy report is more meaningful:

In the early 1950's, the Navy was opposed to building nuclear submarines because their analyst advisers failed to recognize that the increased military effectiveness of nuclear propulsion was worth the extra cost. But, through the initiative taken by Congress, this reluctance was overcome. We now have a total of

99 nuclear submarines authorized and the Department of Defense is requesting authorization for 5 more in the fiscal year 1967 program.

Today we are facing the same problem with regard to nuclear surface warships we faced before with regard to nuclear submarines—the problem of getting analysts to appraise properly the increased military effectiveness of nuclear power. Congress must be alert to assure that the reluctance of the Department of Defense to invest in nuclear-powered surface warships does not cause our Navy to lapse into obsolescence. The United States needs modern warships for its future Navy—warships with the proven advantages of nuclear propulsion.

“Cost effectiveness” studies which have been furnished to the Joint Committee have been cited by the Defense Department to support the contention that the advantages of nuclear propulsion are not particularly significant for surface warships. Review of these studies reveals, however, that they contain a fundamental weakness that makes their conclusions wrong—they are based on false assumptions and do not place proper emphasis on military effectiveness.

These “cost effectiveness” studies were based on—

The assumption that tankers and oilers needed to supply propulsion fuel for oil-fired warships will operate unhampered by the enemy and suffer no losses;

The assumption that the fuel oil needed to run our conventional surface warships will be readily available wherever and whenever needed; and

The assumption that no cost factor need be included in their studies for losses—or protection of our propulsion fuel oil supply lines.

These are dangerous assumptions to use in evaluating weapons of war. The factors of military effectiveness in the protection of our Nation's security must always be dominant over the factors of cost. In southeast Asia today the United States is once again faced with the bitter reality that what counts in war is “military effectiveness”—not “cost effectiveness.”

Following our hearings and thorough study 2 years ago, the Joint Committee on Atomic Energy concluded that—

* * * Each new warship the United States decides to build for our first-line naval striking force should be the best that our technology will allow and should therefore have nuclear propulsion, even if a somewhat higher cost is incurred to pay for the increase in military capability.

Nuclear propulsion has the fundamental advantage of permitting our warships to go any where in the world, to deliver their combat load and to return—all without logistic support. Oil-fired warships must be refueled every few days. This requires a vulnerable, worldwide distribution system to provide fuel oil for conventional ships.

As the number of foreign nuclear submarines increases and as the air-striking capabilities of our potential enemies increase, the difficulty of providing this logistic support in wartime will increase. The basic reason for developing nuclear power for surface warships is to reduce this logistic support—support which will be most difficult, if not impossible under some circumstances, to provide in wartime. Nuclear propulsion in combat ships will free the striking forces of our Navy from the obvious restrictions of reliance on a worldwide propulsion fuel distribution system.

We must plan for times of crisis. It is precisely in such situations that the superior mobility, maneuverability, and reliability of nuclear warships will give the United States an unequalled naval striking force.

The advantages of nuclear propulsion in surface warships are being demonstrated every day by the outstanding performance of the nuclear carrier *Enterprise* and the nuclear frigate *Bainbridge* as they undergo the rigorous test of combat in Vietnam.

I don't believe we can calculate what our future requirements will be. One thing is certain in history, and that is that change depends not on simple mathematical logic, but on a complex chemistry of causes.

NUCLEAR-POWERED SHIPS AS WEAPONS PLATFORMS

I believe the best we can do with our surface ships is to design and build a ship which is a good weapons platform—a platform which can weather the seas, has a good propulsion plant and has a large source of electrical power with adequate margin for future requirements.

Weapons systems are changing so rapidly that between the time Congress authorizes and appropriates for a ship and the time it is built, the weapon system is often obsolete; therefore, we must build the type of ship that is capable of having its weapon system changed in the future. You need the kind of platform that can take different types of weapons systems; if necessary, every 5 or 10 years.

Mr. MAHON. In other words, the weapon system has a relatively short life in comparison to the platform which is the ship?

Admiral RICKOVER. Yes, sir. That is why I advocate building good weapons platforms with suitable provisions for having the weapon system changed in the future if necessary. This can be done. This in my mind is true economy in building naval ships.

You must also have a good propulsion system. The ship must last for 20, 25, or 30 years, so it is highly important when you appropriate large sums of money for a modern warship that there is put into it a good propulsion plant, the one you know is the best. It is foolhardy to install a propulsion plant in a new warship which is not the best you have.

Further, the requirements for electrical power are growing tremendously. The first ship in which I served as a midshipman had a total of 260 kilowatts, supplied by reciprocating engine generators. On the two-reactor carrier we are now designing there will be eight 8,000-kilowatt turbogenerators to take care of present and future electrical requirements. If there is anything in the Navy that is growing, it is the requirement for electrical power. If you don't have a large amount of electrical power available, the ship will not be adequate several years from now. The 64,000 kilowatts of electrical power for the new carrier is about three times the power which was required to propel the battleship *California*. But with nuclear power the ship's range is not reduced by this large block of electrical power. To repeat: the important thing is to get a good platform, get good propulsion, and get a good electrical plant.

This is the point I want to make. If you are thinking 20 to 30 years from now, you cannot afford to put in obsolete equipment.

Building a good platform with a good propulsion system and with adequate electrical power is the cheapest thing we can do. In a few years you can rip out the weapons systems if they become obsolete and install new ones. You still have the good platform, and you can keep on using it over and over again.

Many of the ships in the fleet today have had as much or more than their original cost poured into their weapons systems modernization. This trend is not only continuing; it is accelerating. The initial cost of the nuclear propulsion plant in a new warship is a small fraction of the total cost of the ship over its life. We must not make the decision how to design a ship entirely on an initial cost basis. If we start running the armed services on an initial cost basis, we would no doubt introduce elements into the design and construction of our ships that will ultimately cost us much more money than if the lifetime operating characteristics are also considered initially.

For example, when members of the Joint Committee on Atomic Energy visited the *Enterprise*, they were impressed by the fact that there were many civilian technicians on the ship to work on various parts of the shipboard equipment, such as the radars. There was not

a single civilian technician aboard to work on the nuclear powerplant because we had designed the plant so that the people who operate it can repair and maintain it. It is not only costly to maintain equipment which requires the constant attention of civilian technicians but during war, if the civilian technicians are not available, the ships may not be able to carry out their missions.

If we do not do a good design job, if we do not lay the ship out properly for ease of maintenance and repair, we could well incur costs in the future for maintenance and repair which could have been avoided. Unfortunately, ship maintenance costs are kept in a separate budget and not considered as an initial cost.

I cannot look at it that way in the nuclear powerplant. I would rather pay a little higher initial cost for the plant when the plant is new and there is no radioactivity associated with it. When maintenance is necessary, after the reactor plant has been in operation, there is radioactivity to contend with and that complicates and makes more expensive the otherwise simple jobs. It is the same as buying a suit of clothes or buying a house. You can buy a house that is cheap, but if you are sensible you know the cheap house will require a great deal of maintenance. We must consider the repair and maintenance cost aspects also when we buy a new ship.

COST EFFECTIVENESS ANALYSES

Nuclear power has served to demonstrate the fallibility of expert cost accountants. In so doing, this issue has served a useful purpose. This has resulted in delay in achieving a stronger Navy, but in the long run it may have been worthwhile.

Out of this issue has again been demonstrated the fact that politics is more difficult than physics or cost accounting, and that it is politicians who saw the truth before the cost accountants. The primacy of politics should not again be subordinated to the doctrinaire and unproved claims of specialists—particularly when these specialists are in a position of overall authority and do not encourage or permit contrary views to be voiced or to be asserted.

COST EFFECTIVE VIEW OF HISTORY

The lesson is obvious. I hope that in the future Congress will no longer be as impressed with sociological assertions as it has been in the past. The judgment of politicians is at least as meritorious as the pronouncements of social scientists.

On a cost effectiveness basis the colonists would not have revolted against King George III, nor would John Paul Jones have engaged the *Serapis* with the *Bonhomme Richard*, an inferior ship. The Greeks at Thermopylae and at Salamis would not have stood up to the Persians had they had cost effectiveness people to advise them, or had these cost effectiveness people been in charge. Computer logic would have advised the British to make terms with Hitler in 1940, a course that would have been disastrous to all English-speaking peoples.

Cost effectiveness analyses may be helpful in arriving at an answer if their limitations are understood and if they are used properly. It is the same with computers, no matter how large they are. What a computer tells you depends entirely on the assumptions that have been

ground into the machine. If the assumptions are faulty, then the answer is faulty. And, of course, you must make sure that the computer is capable of answering the specific type of questions which it is asked.

The problem of selecting weapons systems for development, engineering them to completion, introducing them into service, and training the people to operate them requires extensive experience in the field under consideration. Without such experience it is easy to make the mistake of oversimplifying the factors that are taken into consideration and so to reach an incorrect decision.

LIMITATIONS OF ANALYSES

A major difficulty with cost-effectiveness analyses is that the results are limited by the capabilities of the analysts. Considerations which cannot be quantified are necessarily left out of the calculation. These often are the decisive ones, yet only those considerations are included that can be quantified. Since the calculations are extensive and complex, the experienced people in positions of management responsibility do not have the time or the detailed understanding to review them. Judgment as to the weight that should be given to various factors in the analysis is left to the analyst himself, instead of to the judgment of people who have experience in the field that is being analyzed.

How can you analyze vision, foresight, intuition, wisdom? These are not subject to quantitative analysis. Should we then leave them out of our determination of what course of action to take? In my view, many imponderables must be taken into consideration in making any major decision. Consideration must also be given to the capability to implement the decision. Cost-effectiveness analysis is a tool, a limited tool. We must never permit it to be used for the purpose of justifying—by “scientific proof”—a decision which has already been made.

Further, for some studies requested of the military, the nature of the questions establishes the ground rules for the study, such that in effect the conclusions of the study are predetermined.

COST-EFFECTIVENESS STUDIES OF NUCLEAR-POWERED AIRCRAFT CARRIER

I think that cost-effectiveness studies are occasionally used to kill something—to kill it by studying it to death. The use of studies for this purpose is well known in Washington. The question of nuclear propulsion for the carrier *John F. Kennedy* is a good example.

As we discussed earlier today, making the *John F. Kennedy* nuclear powered would have added substantially to the capability of the fleet. However, the decision on this one ship was delayed a year while the Navy attempted to respond to a request to “undertake a comprehensive, quantitative study” of whether “the future Navy will, indeed, make full use of nuclear power.” It was requested that the study “consider the design of the future carrier striking force in the broadest possible context.” Questions were asked such as: How many escort vessels of what type should be included? Should ASW escort be provided in the conventional manner, or should it envision added emphasis on nuclear submarines? How is replenishment of aviation fuel and ordnance to be accomplished? Should the under-

way replenishment ships also be nuclear? How should the Navy be deployed around the world? Would nuclear power speak for a modification of the present concept of the 1st, 2d, 6th, and 7th Fleets? Realizing that we will have a large number of conventionally powered surface vessels in the inventory for some time to come, how should we approach the ultimate design? What are the implications on force size? Would nuclear propulsion allow us to reduce the total number of carriers and/or carrier task forces?

Each time one of these questions was answered, more were asked. The scope of these studies is so vast and vague that all participants could spend their lifetime at it.

As you know, a decision was finally made by the Department of Defense against putting nuclear propulsion in this carrier in order "to avoid further delay" in the construction of the ship. But is it really necessary to engage in cost-effectiveness studies on the whole future of the Navy before we can decide to put nuclear propulsion in a single ship?

Many situations arise where those who have a superior weapon will take an action they would not have taken with a weapon not as good. Factors such as these are not susceptible to computer analysis.

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BARGAINING AND ANALYSIS IN GOVERNMENT

By Henry S. Rowen

(President, The RAND Corporation; former Assistant Director,
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No observant person intimately involved in affairs of Government can fail to be impressed by the contrast between current theories of Government and what actually seems to be going on about him. Part of the discrepancy comes from the complexity of the operations of Government. But much comes from the fact that there have been few systematic attempts to record and analyze actual bureaucratic behavior. Until a great many more behavioral studies have been done, and done with a higher standard of rigor than has been typical so far, we are not likely to make a great deal of progress. (My observations below on Government should not be regarded as inconsistent with this assertion.)

In the absence of such rigorous analysis, the best we have to go on are the more superficial observations and reasoning based on them by participants and spectators of the bureaucratic process.

TWO APPROACHES

The two principal approaches to the operations of Government are what have been called the Hierarchical one and the Bargaining one. The former derives from traditional administrative and economic theories, the latter from pluralist concepts of democratic government. The former has emphasized hierarchies of objectives, lines of authority, division of labor among organizational units, coordination of

policies and programs, and systems efficiency. It is in this tradition that the economics of public expenditures has developed, including in recent years the technique of systems analysis. The bargaining approach is concerned mainly with the fact that individuals and groups with differing values exist, with the power they possess, and with the processes of adjustment among these groups in the workings of government. This approach is rooted in the concept of equity in a democratic society.

In recent years the bargaining view has been very much in the ascendency. For several reasons. It has deep roots in the pluralist tradition, a tradition which is widely and deeply shared in American culture. It seems to be more consistent with the actual workings of government than does the traditional hierarchically oriented administrative theory. The bargaining theorists have, of course, gone further and have not only pointed out that things don't work the way the traditional view would have it, they have adduced strong arguments as to why they shouldn't and can't. Third, important aspects of the theory of public expenditures have come under severe criticism. For example, the conditions to be met for Pareto optimality generally aren't met and the divergences often seem large and difficult or impossible to overcome.

So perhaps the bargaining approach is the only contender of consequence left on the field. I think it is not.

HOW WELL DOES THE PRESENT SYSTEM WORK?

The theory has been developed in its most interesting and recent form by C. E. Lindblom. In his latest book on this subject he asserts that independent, partisan decision makers can be coordinated in several ways in the absence of a central coordinator; that such partisan mutual adjustment is characteristic of the real world; that complex decision making is necessarily fragmented, disjointed and incremental; that having a multiplicity of interacting quasi-independent decision makers promotes rationality; that central decision making doesn't work very well; that partisan mutual adjustment facilitates agreements on values and actions; and that the process promotes consent to democratic government.¹

One comment on this view is that Lindblom has described the way the Government mainly works. The pulling and hauling, adversary dealings, promotion of programs, compromising, marginal adjusting, and related activities are highly visible aspects of governmental behavior from the precinct level on up. It is an important contribution to our understanding of bureaucracy to have the importance of this kind of behavior properly emphasized and to have begun to analyze it systematically.

But if this is not an inaccurate description of the workings of much of the government much of the time, how good are the results of this process, and to the extent they seem not good what can be done to improve things?

If one holds the view that means and ends of government action are indistinguishable and that all of our issues are issues of equity in

¹ C. E. Lindblom, *The Intelligence of Democracy*, New York, The Free Press, 1965.

a pluralistic society, it is difficult to say something meaningful about the goodness or badness of the functioning of government. Presumably the search for objective measures of governmental performance is fruitless. Any program the system produces will do as well as any other and the goodies might as well be distributed one way as another.

This is an extreme view and, I think, not tenable. (The symmetrically opposite, strict hierarchical view is even less tenable.) Not tenable for the following reasons:

Some ends are widely deemed to be better than others. Individuals and groups have preferences, not only on "Who's Right?", but also on "What's Right?". "What's Right?" often commands a high degree of agreement. There are consequences of government action that come pretty near to be objectively "good" or "bad". For example, avoidance of nuclear war, reduction of poverty at home and abroad, providing at least a minimal level of protection from crime and violence, improvement in the status of Negroes. These are widely shared objectives. Although objectives like these are abstractions, and they sometimes conflict with each other and with other objectives, and there are wider differences about ways to accomplish these ends than there is about the ends themselves, these ends do matter. And some actions do better than others at achieving these ends.

That is, efficiency matters also. This assertion might seem trivial. But if means are regarded as ends and if the purpose of the game of government is only income distribution, then why be efficient? One reason is that it has a prominent place in American culture. Another is that if one holds that there are some important objectives, it takes some minimal level of efficiency to get there. Moreover, it may take not only a strong bargaining position but even a degree of efficiency in getting income transferred to the groups deemed worthy of receiving it.

Consider technical efficiency. It seems to make a difference. Some designs of supersonic transports or space vehicles, or sewage treatment plants are better than others in the sense that payload—range or payload—thrust or plant output-input ratios—differ and some designs work better than others. In space, in defense, in transportation, in health, in crime, in flood control, in postal delivery there are many decisions made about which the question of technical efficiency is relevant.

But this is too limited a concept of efficiency. More general is an economic efficiency concept—the least cost combination of factor inputs to accomplish a given objective. Still more general is the measure of both benefits and costs in money terms.

One must be careful, however, to be sure that the same objective is being met by the various means. In the early stages of the manned lunar landing program, the two principal alternatives considered called for an earth-orbiting and a moon-orbiting stage respectively. The object in both cases was to get at least one American to the moon and back alive by 1970. There was little question about the objective being the same. (Even in examples of this kind, some members of our society might prefer one approach based not on technical or social economic criteria but on a preference among manufacturers.)

Clearly there are many cases of a type Lindblom cites where members of society have important differences both among ends and among

the means for achieving given ends. The least cost solution on a high-way *won't* do for many. But, the least cost solution (or at least a relatively low cost solution) is relevant and the partisan mutual adjustment process isn't all that likely to throw it up.

That is, we should not just assume that good (i.e., efficient in one of the senses described above) technical and economic decisions will be made, or even taken into account, by a system operating primarily in a partisan mutual adjustment mode. We should not assume so for several reasons:

(a) Large bureaucracies have remarkable inertia. I use the word "inertia" in the sense used in physics, as the tendency for matter (organizations) to remain at rest, if at rest, or if moving, to keep moving in the same direction. The inner life of organizations and their imperviousness to changes in the external environment is often extraordinary. The celebrated case of the survival of the cavalry for decades past its useful life is a case in point, as is the continued survival of some other governmental anachronisms. The ability of a well-established organization to develop a doctrine, a theory which justifies and defense behavior against outside influences is impressive. The absence of market prices for most of the goods and services produced by government helps to maintain the inertia. So does the restricted nature of the competition that government "firms" also face.

One result is to suppress options, to conceal possibilities that don't conform. Anomalies can exist for very long periods of time with no corrective action being taken.

For example, in our Defense Department we had for many years a situation in which two services were preparing for quite different kinds of wars. Their force structure, their readiness, their logistics, and their ordnance were incompatible. These gaps persisted despite the fact that many people were aware of the problem. But doctrine was too strong. A similar gap existed between our alliance policies abroad and the forces to back up these policies.²

One difficulty with leaving important issues to be thrashed out by the parties that happen to express an interest is that they can argue over the wrong issues. Some years ago there was some debate over the size of the Soviet bomber force versus our own; several years later there was a similar debate over strategic missiles. In both cases, the main issue debated was the number of vehicles on either side; the main real issue was largely undebated: the implications for the vulnerability of the forces.

(b) There are not only wide differences in the bargaining power of the "firms," this bargaining power is not necessarily very highly correlated with the information or the power to take relevant action to accomplish objectives with a high degree of efficiency.

No one can deny the power of the Bureau of Public Roads; one might question the extent to which it has the information to enable it to shape the structure of cities differently than it now does through its urban highway programs or the extent to which it would regard

² Huntington in his book on the Defense Department, *The Common Defense*, contrasts the making of alliance policies and the contingency planning process under relatively strong hierarchical control with the catch-as-catch-can decision making process on military forces. He fails to point out that the ability of the country to support alliance policies and international contingencies is, in fact, strongly dependent on the capability of the forces available. If the system fails to work out this relationship systematically one is not only more likely to waste a lot of money, one is more likely to get into deep trouble.

this as its mission in life. This power may reflect widely shared values or the intensity with which values are felt. But the price in technical and economic diseconomies are often high. In all one uses as a criterion is the pragmatic test of the firm's "sales" (the disputes it wins, the new programs introduced, the old ones sustained, the share of the budget obtained). One hasn't much. And resources wasted often count as much as resources well used on these criteria.

(c) Even where counteravailing power is present, one cannot assert a high probability that the common interest will benefit. If private firms and organized labor are capable of striking bargains which act against the common interest one shouldn't assume that government agencies are not.

Other examples can be cited: We invest quite a lot to move air passengers from airport to airport but have paid little attention to the increasingly significant links in the journey from portal to and from airports. Our maritime policies which have traditionally been worked out via the bargaining mode include an operating subsidy which is structured so as to create a positive incentive to overmanning of ships. Our water resources policies favor expensive means of reducing water pollution over less expensive means. These policies have also produced flood control projects which have generated incentives for people to overbuild in still vulnerable flood plains. In agriculture we pay both to take land out of agricultural production while bringing reclaimed land in. We have a sugar subsidy program which seems to cost three times the net incomes of the sugar producers. We spend ten times on urban roads as on urban mass transit without the balance between these two types of transportation being examined.

It might be held that some of these examples simply illustrate the principle that our political system has decided to transfer income to specific groups, that a politically feasible way has been found to do this, and the fact that apparently contradictory actions are taken by different parts of the government is either evidence of income being transferred to *other* groups or is compensatory action to correct undesirable overall effects of particular subsidies.

This is undoubtedly true—in some cases. But it is my belief, that, on the average, instances of this type are at least as much due to the reasons cited above: bureaucratic inertia, random differences in bargaining power, absence of market forces, unregulated intra-governmental monopolistic practices.

WHAT CAN BE DONE?

Neither model will do. Lindblom is right about the undesirability and infeasibility of a rigidly hierarchical system. But he is, I think, too hopeful about the virtues of the largely bargaining system we have. We need analysis as well.

What do I mean by analysis? For present purposes suffice it to mean an attempt to define objectives, to describe alternative means to these ends, to invent new objectives and new alternative means, to assess benefits and costs, to take account of uncertainties, to quantify what looks useful to quantify, to isolate decisions that can be deferred

from those that can't, to create options. All this may appear ordinary. It is, but it is often difficult to do and it hasn't been attempted much in a systematic way on major public decisions. But it has begun to be done in a significant way with results in the Defense Department that are impressive; I predict that results throughout other parts of government will, in time, be at least as impressive.

There are several necessary conditions for doing better: one is that there exist a structure of adversary relationships, that over a wide range of governmental behavior there exist mechanisms for one group to challenge and debate issues of common interest with other centers. This doesn't work well if left to chance. It requires action from a higher level. This is a familiar problem in the operation of big corporations. It is more an important problem in areas where market mechanisms are weak or absent. Therefore, one subject for systematic analysis is to improve the bargaining phenomena.

Another necessary condition is that there be a system of analysis involving many groups working from many points of view. For no one group can assemble all of the relevant data on a complex issue; values and facts *do* get inter-mixed; ends and means often *do* inter-act; problems must be decomposed for analysis; analysis must be partial; all optimizations are, in some sense, suboptimizations. One can expect, however, through more systematic analysis to narrow the vast areas in which governmental action is uninformed, arbitrary, and based on unenlightened opinion rather than data and analysis. One can create larger conceptual "islands" in which relatively good predictions can be made about the consequences of taking alternative decisions. One can even expect to connect some islands to each other through the development of broader theories. Just as economic theory was extended over time from separate theories on production and consumption and money into a unified macro-theory with major consequences for the conduct of public affairs, so we should expect to develop broader theories of health, of education, of law enforcement. And some of these might even connect. How far can this process continue? Indefinitely. (But I confess my mind boggles at the notion of the unified theory, for example, of postal service, foreign aid, and outer space.) We needn't be concerned about running out of new phenomena. New ones will be identified or become ripe at at least the rate at which old ones are mastered.

Finally, in carrying out analyses what should be done about the absence of conditions for Pareto optimality? Two things. Firstly, try in making analysis, to make corrections that move the results in what seems to be the right direction. Secondly, take some solace from the bargaining viewpoint: our system doesn't mind making interpersonal comparisons and the interactions, over time, of partisan mutual adjusters will see that rough justice gets done.

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THE POLITICAL ECONOMY OF EFFICIENCY: COST-BENEFIT ANALYSIS, SYSTEMS ANALYSIS, AND PROGRAM BUDGETING

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The encroachment of economics upon politics is not difficult to understand. Being political in perspective is viewed as bad; having the perspective of the economist is acclaimed as good. As a discipline, economics has done more with its theory, however inadequate, than has political science. Under some conditions economists can give you some idea of what efficiency requires. It is a rare political scientist who would even concern himself with political rationality. Economists claim to know and work to defend their interests in efficiency: political scientists do not even define their sphere of competence. Thus the market place of ideas is rigged at the start.

There was a day when the meaning of economic efficiency was reasonably clear.

An objective met up with a technician. Efficiency consisted in meeting the objective at the lowest cost or in obtaining the maximum amount of the objective for a specified amount of resources. Let us call this "pure efficiency." The desirability of trying to achieve certain objectives may depend on the cost of achieving them. In this case the analyst (he has graduated from being a mere technician) alters the objective to suit available resources. Let us call this "mixed efficiency." Both pure and mixed efficiency are limited in the sense that they take for granted the existing structure of the political system and work within its boundaries. Yet the economizer, he who values efficiency most dearly, may discover that the most efficient means for accomplishing his ends cannot be secured without altering the machinery for making decisions. He not only alters means and ends (resources and objectives) simultaneously but makes them dependent on changes in political relationships. While he claims no special interest in or expertise concerning the decision apparatus outside of the market place, the economizer pursues efficiency to the heart of the political system. Let us call this "total efficiency." In this vocabulary, then, concepts of efficiency may be pure or mixed, limited or total.

A major purpose of this paper is to take the newest and recently most popular modes of achieving efficiency—cost-benefit analysis, systems analysis, and program budgeting—and show how much more is involved than mere economizing. *Even at the most modest level of cost-benefit analysis, I will try to show that it becomes difficult to maintain pure notions of efficiency. At a higher level, systems analysis is based on a mixed notion of efficiency. And program budgeting at the highest levels leaves pure efficiency far behind its over-reaching grasp into the*

*I am more than ordinarily indebted to the people who have improved this paper through their comments. Win Crowther, John Harsanyi, John Krutilla, Arthur Maas, Arnold Meltzer, Nelson Polsby, William Riker, and Dwight Waldo saved me from errors and contributed insights of their own. The responsibility for what is said is entirely my own.

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structure of the political system. Program budgeting, it turns out, is a form of systems analysis, that is, political systems analysis.

These modes of analysis are neither good for nothing nor good for everything, and one cannot speak of them as wholly good or bad. It is much more useful to try to specify some conditions under which they would or would not be helpful for various purposes. While such a list could not be exhaustive at this stage, nor permanent at any stage (because of advances in the art), it provides a basis for thinking about what these techniques can and cannot do. Another major purpose of this paper, therefore, is to describe cost-benefit and systems analysis and program budgeting as techniques for decision-making. I shall place particular stress upon what seems to me the most characteristic feature of all three modes of analysis: the aids to calculation designed to get around the vast areas of uncertainty where quantitative analysis leaves off and judgment begins.

COST-BENEFIT ANALYSIS

* * * One can view cost-benefit analysis as anything from an infallible means of reaching the new Utopia to a waste of resources in attempting to measure the unmeasurable.¹

The purpose of cost-benefit analysis is to secure an efficient allocation of resources produced by the governmental system in its interaction with the private economy. The nature of efficiency depends on the objectives set up for government. In the field of water resources, where most of the work on cost-benefit analysis has been done, the governmental objective is usually postulated to be an increase in national income. In a crude sense, this means that the costs to whomever may incur them should be less than the benefits to whomever may receive them. The time streams of consumption gained and foregone by a project are its benefits and costs.

The aim of cost-benefit analysis is to maximize "the present value of all benefits less that of all costs, subject to specified restraints."² A long view is taken in that costs are estimated not only for the immediate future but also for the life of the project. A wide view is taken in that indirect consequences for others—variously called externalities, side-effects, spillovers, and repercussion effects—are considered. Ideally, all costs and benefits are evaluated. The usual procedure is to estimate the installation costs of the project and spread them over time, thus making them into something like annual costs. To these costs are added an estimate of annual operating costs. The next step involves estimating the average value of the output by considering the likely number of units produced each year and their probable value in the market place

¹ A. R. Prest and R. Turvey, "Cost-Benefit Analysis: A Survey," *The Economic Journal*, Vol. LXXV, December, 1965, pp. 683-735. I am much indebted to this valuable and discerning survey. I have also relied upon:

Otto Eckstein, "A Survey of the Theory of Public Expenditure Criteria," in *Public Finances: Needs, Sources, and Utilization*, National Bureau of Economic Research (New York, Princeton University Press, 1961), pp. 439-504.

Irving K. Fox and Orris C. Herfindahl, "Attainment of Efficiency in Satisfying Demands for Water Resources," *American Economic Review*, May, 1964, pp. 198-206.

Charles J. Hitch, *On the Choice of Objectives in Systems Studies* (Santa Monica, The RAND Corporation, 1960).

John V. Krutilla, "Is Public Intervention in Water Resources Development Conducive to Economic Efficiency," *Natural Resources Journal*, January, 1966, pp. 60-75.

John V. Krutilla and Otto Eckstein, *Multiple Purpose River Development* (Baltimore, Johns Hopkins Press, 1958).

Roland N. McKean, *Efficiency in Government Through Systems Analysis with Emphasis on Water Resources Development*, (New York, 1958).

² Prest and Turvey, *ibid.*, p. 686.

of the future. Intangible, "secondary," benefits may then be considered. These time streams of costs and benefits are discounted so as to obtain the present value of costs and benefits. Projects whose benefits are greater than costs may then be approved, or the cost-benefit ratios may, with allowance for relative size, be used to rank projects in order of desirability.

Underlying Economic and Political Assumptions

A straightforward description of cost-benefit analysis cannot do justice to the powerful assumptions that underlie it or to the many conditions limiting its usefulness. The assumptions involve value judgments that are not always recognized and, when recognized, are not easily handled in practice. The limiting conditions arise partly out of the assumptions and partly out of severe computational difficulties in estimating costs, and especially benefits. Here I can only indicate some major problems.

Cost-benefit analysis is based on superiority in the market place,³ under competitive conditions and full employment, as the measure of value in society. Any imperfection in the market works against the validity of the results. Unless the same degree of monopoly were found throughout the economy, for example, a governmental body that enjoys monopolistic control of prices or outputs would not necessarily make the same investment decisions as under free competition. A similar difficulty occurs where the size of a project is large in comparison to the economy, as in some developing nations. The project itself then affects the constellation of relative prices and production against which its efficiency is measured. The assumption based on the classical full employment model is also important because it gives prices special significance. Where manpower is not being utilized, projects may be justified in part as putting this unused resource to work.

The economic model on which cost-benefit analysis depends for its validity is based on a political theory. The idea is that in a free society the economy is to serve the individual's consistent preferences revealed and rationally pursued in the market place. Governments are not supposed to dictate preferences nor make decisions.

This individualist theory assumes as valid the current distribution of income. Preferences are valued in the market place where votes are based on disposable income. Governmental action to achieve efficiency, therefore, inevitably carries with it consequences for the distribution of income. Projects of different size and location and composition will transfer income in different amounts to different people. While economists might estimate the redistributive consequences of various projects, they cannot, on efficiency grounds, specify one or another as preferable. How is this serious problem to be handled?

Benefit-cost analysis is a way of trying to promote economic welfare. But whose welfare? No one knows how to deal with interpersonal comparisons of utility. It cannot be assumed that the desirability of rent supplements versus a highway or dam can be measured on a single utility scale. There is no scientific way to compare losses and gains

³ In many important areas of policy such as national defense it is not possible to value the product directly in the market place. Since benefits cannot be valued in the same way as costs, it is necessary to resort to a somewhat different type of analysis. Instead of cost-benefit analysis, therefore, the work is usually called cost-effectiveness or cost-utility analysis.

among different people or to say that the marginal loss of a dollar to one man is somehow equal to the gain of a dollar by another. The question of whose utility function is to prevail (the analyst versus the people involved, the upstream gainers versus the downstream losers, the direct beneficiaries versus the taxpayers, the entire nation or a particular region, and so on) is of prime importance in making public policy.

The literature on welfare economics is notably unable to specify an objective welfare function.⁴ Ideally, actions would benefit everyone and harm no one. As an approximation, the welfare economists views as optimal an action that leaves some people better off and none worse off. If this criterion were applied in political life, it would result in a situation like that of the Polish Diet in which anyone who was damaged could veto legislation. To provide a way out of this impasse, Hicks and Kaldor proposed approval of decisions if the total gain in welfare is such that the winners could compensate the losers. But formal machinery for compensation does not ordinarily exist and most modern economists are highly critical of the major political mechanism for attempting to compensate, namely, log-rolling in Congress on public works projects.⁵ It is a very imperfect mechanism for assuring that losers in one instance become winners in another.

Another way of dealing with income distribution is to accept a criterion laid down by a political body and maximize present benefits less costs subject to this constraint. Or the cost-benefit analyst can present a series of alternatives differing according to the individuals who pay and prices charged. The analyst must not only compute the new inputs and outputs, but also the costs and benefits for each group with whom the public authorities are especially concerned. No wonder this is not often done! Prest and Turvey are uncertain whether such a procedure is actually helpful in practice.⁶

Income redistribution in its most extreme form would result in a complete leveling or equality of incomes. Clearly, this is not what is meant. A more practical meaning might be distributing income to the point where specific groups achieve a certain minimum. It is also possible that the operational meaning of income redistribution may simply be the transfer of some income from some haves to some have nots. Even in the last and most minimal sense of the term it is by no means clear that projects that are inefficient by the usual economic criteria serve to redistribute income in the desired direction. It is possible that some inefficient projects may transfer income from poorer to richer people. Before the claim that certain projects are justified by the effect of distributing income in a specified way can be accepted, an analysis to show that this is what actually happens must be at hand.

⁴ A. Bergson, "A Reformulation of Certain Aspects of Welfare Economics," *Quarterly Journal of Economics*, February, 1938; N. Kaldor, "Welfare Propositions and Interpersonal Comparisons of Utility," *Economic Journal*, 1939, pp. 549-52; J. R. Hicks, "The Valuation of Social Income," *Economica*, 1940, pp. 105-24; J. M. D. Little, *A Critique of Welfare Economics*, (Oxford, 1950); W. J. Baumol, *Welfare Economics and the Theory of the State* (Cambridge, 1952); T. Scitovsky, "A Note on Welfare Propositions in Economics," *Review of Economic Studies*, 1942, pp. 98-110; J. E. Meade, *The Theory of International Economic Policy*, Vol. II: *Trade and Welfare* (New York, 1954).

⁵ For a different view, see James M. Buchanan and Gordon Tullock, *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (Ann Arbor, University of Michigan Press, 1962).

⁶ Prest and Turvey, *op. cit.*, p. 702. For a contrary view, see Arthur Maas, "Benefit-Cost Analysis: Its Relevance to Public Investment Decisions," Vol. LXXX *The Quarterly Journal of Economics*, May, 1966, pp. 208-226.

Since the distribution of income is at stake, it is not surprising that beneficiaries tend to dominate investment decisions in the political arena and steadfastly refuse to pay for what they receive from government tax revenues. They uniformly resist user charges based on benefits received. Fox and Herfindahl estimate that of a total initial investment of three billion for the Corps of Engineers in 1962, taxpayers in general would pay close to two-thirds of the costs.⁷ Here, greater use of the facilities by a larger number of beneficiaries getting something for nothing inflates the estimated benefits which justify the project in the first place. There may be a political rationale for these decisions, but it has not been developed.

In addition to redistributing income, public works projects have a multitude of objectives and consequences. Projects may generate economic growth, alleviate poverty among some people, provide aesthetic enjoyment and opportunities for recreation, improve public health, reduce the risks of natural disaster, alter travel patterns, affect church attendance, change educational opportunities, and more. No single welfare criterion can encompass these diverse objectives. How many of them should be considered? Which are susceptible of quantification? The further one pursues this analysis, the more impassable the thicket.

Limitations in the Utility of Cost-Benefit Analysis

One possible conclusion is that at present certain types of cost-benefit analysis are not meaningful. In reviewing the literature on the calculus of costs and benefits in research and development, for example, Prest and Turvey comment on "the uncertainty and unreliability of cost estimates . . . and . . . the extraordinarily complex nature of the benefits. . . ." ⁸

Another conclusion is that one should be cautious in distinguishing the degree to which projects are amenable to cost-benefit analysis.

* * * When there are many diverse types of benefits from a project and/or many different beneficiaries it is difficult to list them all and to avoid double counting. This is one reason why it is so much easier to apply cost-benefit analysis to a limited purpose development, say, than it is to the research and development aspects of some multi-purpose discovery, such as a new type of plastic material. . . . It is no good expecting those fields in which benefits are widely diffused, and in which there are manifest divergences between accounting and economic costs or benefits, to be as cultivable as others. Nor is it realistic to expect that comparisons between projects in entirely different branches of economic activity are likely to be as meaningful or fruitful as those between projects in the same branch. The technique is more useful in the public-utility area than in the social-services area of government.⁹

If the analysis is to be useful at all, calculations must be simplified.¹⁰ The multiple ramifications of interesting activities can be taken into account only at the cost of introducing fantastic complexities. Prest and Turvey remark of one such attempt, that "This system . . . requires knowledge of all the demand and supply equations in the economy, so is scarcely capable of application by road engineers."¹¹ They suggest omitting consideration where (1) side effects are judged not terribly large or where (2) concern for these effects belongs to another governmental jurisdiction.¹²

⁷ Irving K. Fox and Orris C. Herfindahl, "Attainment of Efficiency in Satisfying Demands for Water Resources," *American Economic Review*, May, 1964, p. 200.

⁸ Prest and Turvey, *op. cit.*, p. 727.

⁹ *Ibid.*, pp. 729, 731.

¹⁰ David Braybrooke and Charles Lindblom, *A Strategy for Decision* (New York, 1963).

¹¹ Prest and Turvey, *op. cit.*, p. 714.

¹² *Ibid.*, p. 705.

If certain costs or benefits are deemed important but cannot be quantified, it is always possible to guess. The increasing use of recreation and aesthetic facilities to justify public works projects in the United States is disapproved by most economists because there can be a vast, but hidden, inflation of these benefits. For example, to attribute the same value to a recreation day on a reservoir located in a desert miles from any substitute source of water as to a day on an artificial lake in the heart of natural lake country is patently wrong. Economists would prefer to see recreation facilities listed in an appendix so that they can be taken into account in some sense, or, alternatively, that the project be presented with and without the recreation facilities, so that a judgment can be made as to whether the additional services are worth the cost.¹³

Economists distinguish between risk, where the precise outcome cannot be predicted but a probability distribution can be specified, and uncertainty, where one does not even know the parameters of the outcomes. The cost-benefit analyst must learn to live with uncertainty, for he can never know whether all relevant objectives have been included and what changes may occur in policy and in technology.

It is easy enough to cut the life of the project below its expected economic life. The interest rate can be raised. Assumptions can be made that costs will be higher and benefits lower than expected. All these methods, essentially conservative, are also highly arbitrary. They can be made somewhat more systematic, however, by sensitivity analysis in which length of life, for instance, is varied over a series of runs so that its impact on the project can be appraised.

Lessening uncertainty by hiking the interest or discount rate leads to greater difficulties, for the dominance of "higher" criteria over economic analysis is apparent in the frustrating problem of choosing the correct interest rate at which to discount the time streams of costs and benefits essential to the enterprise. Only an interest rate can establish the relationship between values at different periods of time. Yet people differ in preferences for the present versus the intermediate or long-run value. Moreover, the interest rate should also measure the opportunity cost of private capital that could be used to produce wealth elsewhere in the economy if it had not been used up in the form of tax income spent on the project under consideration. Is the appropriate rate the very low cost the government charges, the cost of a government corporation like TVA that must pay a somewhat higher rate, the going rate of interest for private firms, or an even higher rate to hedge against an uncertain future? As Otto Eckstein has observed, ". . . the choice of interest rates must remain a value judgment."¹⁴

If the efficiency of a project is insensitive to interest costs, then these costs can vary widely without mattering much. But Fox and Herfindahl discovered that if Corps of Engineer projects raised their in-

¹³ See Jack L. Knetch, "Economics of Including Recreation as a Purpose of Water Resource Projects," *Journal of Farm Economics*, December, 1964, p. 1155. No one living in Berkeley, where "a view" is part of the cost of housing, could believe that aesthetic values are forever going to remain beyond the ingenuity of the quantifier.

There are also costs and benefits, such as the saving and losing of human life, that can be quantified but can only be valued in the market place in a most peculiar (or ghoulsh) sense. See Burton Welsbrod, *The Economics of Public Health; Measuring the Economic Impact of Diseases* (Philadelphia, 1961), for creative attempt to place a market value on human life. Few of us would want to make decisions about public health by use of this criterion, not at least if we were the old person whose future social value contribution is less than his cost to the authorities.

¹⁴ Otto Eckstein, *op. cit.*, p. 460.

terest (or discount) rate from $2\frac{5}{8}$ to 4, 6, or 8 per cent, then 9, 64, and 80 per cent of their projects, respectively, would have had a benefit-cost ratio of less than unity.¹⁵ This single value choice among many has such large consequences that it alone may be decisive.

The Mixed Results of Cost-Benefit Analysis

Although cost-benefit analysis presumably results in efficiency by adding the most to national income, it is shot through with political and social value choices and surrounded by uncertainties and difficulties of computation. Whether the many noneconomic assumptions and consequences actually result in basically changing the nature of a project remains moot. Clearly, we have come a long way from pure efficiency, to verge upon mixed efficiency.

Economic analysts usually agree that all relevant factors (especially nonmarket factors) cannot be squeezed into a single formula. They therefore suggest that the policy maker, in being given the market costs and benefits of alternatives, is, in effect, presented with the market value he is placing on nonmarket factors. The contribution of the analyst is only one input into the decision, but the analyst may find this limited conception of his role unacceptable to others. Policy makers may not want this kind of input; they may want *the* answer, or at least an answer that they can defend on the basis of the analyst's legitimized expertise.

The dependence of cost-benefit analysis on a prior political framework does not mean that it is a useless or trivial exercise. Decisions must be made. If quantifiable economic costs and benefits are not everything, neither would a decision-maker wish to ignore them entirely. The great advantage of cost-benefit analysis, when pursued with integrity, is that some implicit judgments are made explicit and subject to analysis. Yet, for many, the omission of explicit consideration of political factors is a serious deficiency.

The experience of the Soil Conservation Service in lowering certain political costs may prove illuminating. For many years the Service struggled along with eleven major watershed projects involving big dams, great headaches, and little progress. Because the watersheds were confined to a single region, it was exceedingly difficult to generate support in Congress, particularly at appropriations time. The upstream-downstream controversies generated by these projects resulted in less than universal local approval. The SCS found itself in the direct line of fire for determining priorities in use of insufficient funds.

Compare this situation with the breakthrough which occurred when SCS developed the small watershed program. Since each facility is relatively inexpensive, large numbers can be placed throughout the country, markedly increasing political support. Agreement on the local level is facilitated because much less land is flooded and side payments are easier to arrange. A judicious use of cost-benefit analysis, together with ingenious relationships with State governors, places the choice of priorities with the States and yet maintains a reasonable level of consistency by virtue of adherence to national criteria. Errors are easier to correct because the burden of calculation has been drastically reduced and experience may be more easily accumulated with a larger number of small projects.

¹⁵ Fox and Herfindahl, *op. cit.*, p. 202.

Consider the situation in which an agency finds it desirable to achieve a geographical spread of projects in order to establish a wider base of support. Assume (with good reason) that cost-benefit criteria will not permit projects to be established in some states because the value of the land or water is too low. One can say that this is just too bad and observe the agency seeking ways around the restriction by playing up benefits, playing down costs, or attacking the whole benefit-cost concept as inapplicable. Another approach would be to recognize that federalism—meaning, realistically, the distribution of indulgences to State units—represents a political value worth promoting to some extent and that gaining nationwide support is important. From this perspective, a compromise solution would be to except one or two projects in each State or region from meeting the full requirement of the formula, though the projects with the highest benefit-cost ratio would have to be chosen. In return for sacrificing full adherence to the formula in a few instances, one would get enhanced support for it in many others.

Everyone knows, of course, that cost-benefit analysis is not the messiah come to save water resources projects from contamination by the rival forces of ignorance and political corruption. Whenever agencies and their associated interests discover that they cannot do what they want, they may twist prevailing criteria out of shape: Two projects may be joined so that both qualify when one, standing alone, would not. Costs and benefits may be manipulated, or the categories may be so extended that almost any project qualifies. On the other hand, cost-benefit analysis has some “good” political uses that might be stressed more than they have been. The technique gives the responsible official a good reason for turning down projects, with a public-interest explanation the Congressman can use with his constituents and the interest-group leader with his members.

This is not to say that cost-benefit analysis has little utility. Assuming that the method will continue to be improved, and that one accepts the market as the measure of economic value, it can certainly tell decision makers something about what they will be giving up if they follow alternative policies. The use of two analyses, one based on regional and the other on national factors, might result in an appraisal of the economic costs of federalism.

The burden of calculation may be reduced by following cost-benefit analysis for many projects and introducing other values only for a few. To expect, however, that the method itself (which distributes indulgences to some and deprivations to others) would not be subject to manipulation in the political process is to say that we shall be governed by formula and not by men.

Because the cost-benefit formula does not always jibe with political realities—that is, it omits political costs and benefits—we can expect it to be twisted out of shape from time to time. Yet cost-benefit analysis may still be important in getting rid of the worst projects. Avoiding the worst where one can't get the best is no small accomplishment.

SYSTEMS ANALYSIS

The good systems analyst is a “chochem,” a Yiddish word meaning “wise man”, with overtones of “wise guy.” His forte is creativity. Although he sometimes relates means to ends and fits ends to match

means, he ordinarily eschews such pat processes, preferring instead to relate elements imaginatively into new systems that create their own means and ends. He plays new objectives continuously against cost elements until a creative synthesis has been achieved. He looks down upon those who say that they take objectives as given, knowing full well that the apparent solidity of the objective will dissipate during analysis and that, in any case, most people do not know what they want because they do not know what they can get.

Since no one knows how to teach creativity, daring, and nerve, it is not surprising that no one can define what systems analysis is or how it should be practiced. E. S. Quade, who compiled the RAND Corporation lectures on systems analysis, says it "is still largely a form of art" in which it is not possible to lay down "fixed rules which need only be followed with exactness."¹⁶ He examined systems studies to determine ideas and principles common to the good ones, but discovered that "no universally accepted set of ideas existed. It was even difficult to decide which studies should be called good."¹⁷

Systems analysis is derived from operations research, which came into use during World War II when some scientists discovered that they could use simple quantitative analysis to get the most out of existing military equipment. A reasonably clear objective was given, and ways to cut the cost of achieving it could be developed, using essentially statistical models. Operations research today is largely identified with specific techniques: linear programming; Monte Carlo (randomizing) methods; gaming and game theory. While there is no hard and fast division between operations research and systems analysis, a rough separation may perhaps be made. The less that is known about objectives, the more they conflict, the larger the number of elements to be considered, the more uncertain the environment, the more likely it is that the work will be called a systems analysis. In systems analysis there is more judgment and intuition and less reliance on quantitative methods than in operations research.

Systems analysis builds models that abstract from reality but represent the crucial relationships. The systems analyst first decides what questions are relevant to his inquiry, selects certain quantifiable factors, cuts down the list of factors to be dealt with by aggregation and by eliminating the (hopefully) less important ones, and then gives them quantitative relationships with one another within the system he has chosen for analysis. But crucial variables may not be quantifiable. If they can be reduced to numbers, there may be no mathematical function that can express the desired relationship. More important, there may be no single criterion for judging results among conflicting objectives. Most important, the original objectives, if any, may not make sense.

It cannot be emphasized too strongly that a (if not the) distinguishing characteristic of systems analysis is that the objectives are either not known or are subject to change. Systems analysis, Quade tells us, "is associated with that class of problems where the difficulties lie in deciding what ought to be done—not simply how to do it—and honors

¹⁶ E. S. Quade, *Analysis for Military Decisions* (Chicago, 1964), p. 153.

¹⁷ *Ibid.*, p. 149.

go to people who . . . find out what the problem is.”¹⁸ Charles Hitch, the former Comptroller of the Defense Department, insists that:

. . . learning about objectives is one of the chief objects of this kind of analysis. We must learn to look at objectives as critically and as professionally as we look at our models and our other inputs. We may, of course, begin with tentative objectives, but we must expect to modify or replace them as we learn about the systems we are studying—and related systems. The feedback on objectives may in some cases be the most important result of our study. We have never undertaken a major system study at RAND in which we are able to define satisfactory objectives at the beginning of the study.¹⁹

Systems analysts recognize many good reasons for their difficulties in defining problems or objectives. Quade reaches the core: “Objectives are not, in fact, agreed upon. The choice, while ostensibly between alternatives, is really between objectives or ends and nonanalytic methods must be used for a final reconciliation of views.”²⁰ It may be comforting to believe that objectives come to the analyst from on high and can be taken as given, but this easy assumption is all wrong. “For all sorts of good reasons that are not about to change,” says Hitch, “official statements of national objectives (or company objectives) tend to be nonexistent or so vague and literary as to be non-operational.”²¹ Objectives are not only likely to be “thin and rarified,” according to Wohlstetter, but the relevant authorities “are likely to conflict. Among others there will be national differences within an alliance and within the nation, interagency, interservice, and intraservice differences. . . .”²²

Moreover, even shared objectives often conflict with one another. Deterrence of atomic attack might be best served by letting an enemy know that we would respond with an all-out, indiscriminate attack on his population. Defense of our population against death and destruction might not be well served by this strategy,²³ as the Secretary of Defense recognized when he recommended a city-avoidance strategy that might give an enemy some incentive to spare our cities as well. Not only are objectives large in number and in conflict with one another, they are likely to engender serious repercussion effects. Many objectives, like morale and the stability of alliances, are resistant to quantification. What is worth doing depends on whether it can be done at all, how well, and at what cost. Hence, objectives really cannot be taken as given; they must be made up by the analyst. “In fact,” Wohlstetter declares, “we are always in the process of choosing and modifying both means and ends.”²⁴

Future systems analysts are explicitly warned not to let clients determine objectives. A suggestive analogy is drawn with the doctor who would not ignore a patient’s “description of his symptoms, but . . . cannot allow the patient’s self diagnosis to override his own professional judgment.”²⁵ Quade argues that since systems analysis has often resulted in changing the original objectives of the policy-maker, it

¹⁸ *Ibid.*, p. 7.

¹⁹ Charles J. Hitch, *op. cit.*, p. 19.

²⁰ E. S. Quade, *op. cit.*, p. 176.

²¹ Charles J. Hitch, *op. cit.*, pp. 4–5.

²² Albert Wohlstetter, “Analysis and Design of Conflict Systems,” in E. S. Quade, *op. cit.*, p. 121.

²³ See Glenn H. Snyder, *Deterrence and Defense* (Princeton, 1961).

²⁴ Wohlstetter in Quade, *op. cit.*, p. 122.

²⁵ E. S. Quade, *op. cit.*, p. 157. Quade attempts to soften the blow by saying that businessmen and military officers know more about their business than any one else. But the import of the analogy is clear enough.

would be “self-defeating to accept without inquiry” his “view of what the problem is.”²⁶

I have stressed the point that the systems analyst is advised to insist on his own formulation of the problem because it shows so closely that we are dealing with a mixed concept of efficiency.

Adjusting objectives to resources in the present or near future is difficult enough without considering future states of affairs which hold tremendous uncertainty. Constants become variables; little can be taken for granted. The rate of technological progress, an opponent's estimate of your reaction to his latest series of moves based on his reaction to yours, whether or not atomic war will occur, what it will be like, whether we shall have warning, whether the system we are working on will cost anything close to current estimates and whether it will be ready within five years of the due date—on most of these matters, there are no objective probabilities to be calculated.

An effective dealing with uncertainty must be a major goal of systems analysis. Systems analysis is characterized by the aids to calculation it uses, not to conquer, but to circumvent and mitigate some of the pervasive effects of uncertainty. Before a seemingly important factor may be omitted, for example, a sensitivity analysis may be run to determine whether its variation significantly affects the outcome. If there is no good basis for calculating the value of the factor, arbitrary values may be assigned to test for extreme possibilities. Contingency analysis is used to determine how the relative ranking of alternatives holds up under major changes in the environment, say, a new alliance between France and Russia, or alterations in the criteria for judging the alternatives, such as a requirement that a system work well against attacks from space as well as earth. Contingency analysis places a premium on versatility as the analyst seeks a system that will hold up well under various eventualities even though it might be quite as good for any single contingency as an alternative system. Adversary procedures may be used to combat uncertainty. Bending over backwards to provide advantages for low ranking systems and handicaps for high ranking systems is called a *fortiori* analysis. Changing crucial assumptions in order to make the leading alternatives even, so that one can judge whether the assumptions are overly optimistic or pessimistic, is called *break-even analysis*.²⁷ Since all these methods add greatly to the burden of calculation, they must be used with some discretion.

A variety of insurance schemes may also be used to deal with uncertainty. In appraising what an opponent can do, for instance, one can assume the worst, the best, and sheer inertia. In regard to the development of weapons, insurance requires not one flexible weapon but a variety of alternatives pursued with vigor. As development goes on, uncertainty is reduced. Consequently, basic strategic choice involves *determining how worthwhile paying for the additional information* is by developing rival weapons systems to the next stage. The greater the uncertainty of the world, the greater the desirability of having the widest selection of alternative weapons to choose from to meet unexpected threats and opportunities. Alchian and Kessel are so wedded to

²⁶ *Ibid.*, pp. 156-57.

²⁷ Herman Kahn and Irwin Mann, *Techniques of Systems Analysis* (Santa Monica, The RAND Corporation, 1957), believe that “More than any single thing, the skilled use of a *fortiori* and break-even analyses separates the professionals from the amateurs.” They think that convincing others that you have a good solution is as important as coming up with one.

the principle of diversified investment that they “strongly recommend this theorem as a basic part of systems analysis.”²⁸

As a form of calculation, systems analysis represents a merger of quantitative methods and rules of thumb. First, the analyst attempts to solve the problem before he knows a great deal about it. Then he continuously alters his initial solution to get closer to what he intuitively feels ought to be wanted. Means and ends are continuously played off against one another. New objectives are defined, new assumptions made, new models constructed, until a creative amalgam appears that hopefully defines a second best solution, one that is better than others even if not optimal in any sense. In the famous study of the location of military bases conducted by Albert Wohlstetter and his associates at the RAND Corporation, widely acknowledged as a classic example of systems analysis, Wohlstetter writes:

The base study . . . proceeded by a method of successive approximations. It compared forces for their efficiency in carrying a payload between the bases and targets without opposition either by enemy interceptors or enemy bombers. Then, it introduced obstacles successively: first, enemy defenses; then enemy bombardment of our bombers and other elements needed to retaliate. In essence, then, the alternative systems were tested for their first-strike capability and then they were compared for their second-strike capacity. And the programmed system performed in a drastically different way, depending on the order in which the opposing side struck. In the course of analyzing counter-measures and counter-counter-measures, the enemy bombardment turned out to be a dominant problem. This was true even for a very much improved overseas operating base system. The refueling base system was very much less sensitive to strike order. It is only the fact that strike order made such a difference among systems contemplated that gave the first-strike, second-strike distinction an interest. And it was not known in advance of the analysis that few of the programmed bombers would have survived to encounter the problem of penetrating enemy defenses which had previously been taken as the main obstacle. The analysis, then, not only was affected by the objectives considered, it affected them.²⁹

The advantage of a good systems study is that by running the analysis through in theory on paper certain disadvantages of learning from experience may be avoided.

If the complexity of the problems encountered proved difficult in cost-benefit analysis, the burdens of calculation are ordinarily much greater in systems analysis. Many aspects of a problem simply must be put aside. Only a few variables can be considered simultaneously. “Otherwise,” Roland McKean tells us, “the models would become impossibly cumbersome, and . . . the number of calculations to consider would mount in the thousands.”³⁰ Formulas that include everything may appear more satisfactory but those that cannot be reduced “to a single expression are likely to convey no meaning at all. . . .”³¹ Summing up their experience, Hitch and McKean assert that:

. . . analyses must be piecemeal, since it is impossible for a single analysis to cover all problems of choice simultaneously in a large organization. Thus comparisons of alternative courses of action always pertain to a part of the government's (or corporation's) problem. Other parts of the over-all problem are temporarily put aside, possible decisions about some matters being ignored, specific decisions about others being taken for granted. The resulting analyses are intended to provide assistance in finding optimal, or at least good, solutions to sub-

²⁸ Armen A. Alchian and Reuben A. Kessel, *A Proper Role of Systems Analysis* (Santa Monica, RAND Corporation, 1954), p. 9.

²⁹ Albert Wohlstetter in E. S. Quade, *op. cit.*, pp. 125-26.

³⁰ R. N. McKean, “Criteria,” in E. S. Quade, *op. cit.*, p. 83.

³¹ E. S. Quade, *op. cit.*, p. 310.

problems: in the jargon of systems and operations research, they are sub-optimizations.³²

Although admitting that much bad work is carried on and that inordinate love of numbers and machines often get in the way of creative work,³³ practitioners of systems analysis believe in their art. "All of them point out how the use of analysis can provide some of the knowledge needed, how it may sometime serve as a substitute for experience, and, most importantly, how it can work to sharpen intuition."³⁴ Systems analysis can increase explicitness about the assumptions made and about exclusions from the analysis. The claim is that systems analysis can be perfected; sheer intuition or unaided judgment can never be perfect.

Yet there is also wide agreement that systems analysts "do philosophy,"³⁵ that they are advocates of particular policy alternatives. What Schelling calls "the pure role of expert advisor" is not available for the analyst who "must usually formulate the questions themselves for his clients."³⁶ Beyond that, Wohlstetter argues that systems analysts can perform the function of integrating diverse values. New systems can sometimes be found that meet diverse objectives.³⁷ The politician who gains his objectives by inventing policies that also satisfy others, or the leader of a coalition who searches out areas of maximum agreement, performs a kind of informal systems analysis.

All these men, however, work within the existing political structure. While cost-benefit analysis may contain within it implicit changes in existing governmental policies, it poses no direct challenge to the general decision-making machinery of the political system. Program budgeting is a form of systems analysis that attempts to break out of these confines.

PROGRAM BUDGETING

It is always important, and perhaps especially so in economics, to avoid being swept off one's feet by the fashions of the moment.³⁸

So this new system will identify our national goals with precision . . .³⁹

On August 25, 1965, President Johnson announced that he was asking the heads of all Federal agencies to introduce "a very new and revolutionary system" of program budgeting. Staffs of experts set up in each agency would define goals using "modern methods of program analysis." Then the "most effective and the least costly" way to accomplish these goals would be found.⁴⁰

Program budgeting has no standard definition. The general idea is that budgetary decisions should be made by focusing on output categories like governmental goals, objectives, end products or programs instead of inputs like personnel, equipment, and maintenance. As in cost-benefit analysis, to which it owes a great deal, program budget-

³² Charles J. Hitch and Roland N. McKean, *The Economics of Defense in the Nuclear Age* (Cambridge, Harvard University Press, 1961), p. 161.

³³ See Hitch on "Mechanitis—putting . . . machines to work as a substitute for hard thinking." Charles Hitch, "Economics and Operations Research: A Symposium. II," *Review of Economics and Statistics*, August, 1958, p. 204.

³⁴ E. S. Quade, *op. cit.*, p. 12.

³⁵ *Ibid.*, p. 5.

³⁶ T. C. Schelling, "Economics and Operations Research: A Symposium. V. Comment," *Review of Economics and Statistics*, August 1958, p. 222.

³⁷ Albert Wohlstetter in E. S. Quade, *op. cit.*, p. 122.

³⁸ Prest and Turvey, *op. cit.*, p. 684.

³⁹ David Novick, Editor, *Program Budgeting* (Cambridge, Harvard University Press, 1965), p. vi.

⁴⁰ *Ibid.*, p. v.

ing lays stress on estimating the total financial cost of accomplishing objectives. What is variously called cost-effectiveness or cost-utility analysis is employed in order to select "alternative approaches to the achievement of a benefit already determined to be worth achieving."⁴¹

Not everyone would go along with the most far-reaching implications of program budgeting, but the RAND Corporation version, presumably exported from the Defense Department, definitely does include "institutional reorganization to bring relevant administrative functions under the jurisdiction of the authority making the final program decisions." In any event, there would be "information reporting systems and shifts in the power structure to the extent necessary to secure compliance with program decisions by the agencies responsible for their execution."⁴² Sometimes it appears that comprehensiveness—simultaneous and complete examination of all programs and all alternatives to programs every year—is being advocated. Actually, comprehensiveness has been dropped (though not without regret) because "it may be too costly in time, effort, uncertainty, and confusion."⁴³ There exists considerable ambivalence as to whether decisions are implicit in the program categories or merely provide information to improve the judgment of governmental officials.

*Programs are not made in heaven. There is nothing out there that is just waiting to be found. Programs are not natural to the world; they must be imposed on it by men. No one can give instructions for making up programs. There are as many ways to conceive of programs as there are of organizing activity,*⁴⁴ as the comments of the following writers eloquently testify:

It is by no means obvious . . . whether a good program structure should be based on components of specific end objectives (e.g., the accomplishment of certain land reclamation targets), on the principle of cost separation (identifying as a program any activity the costs of which can be readily segregated), on the separation of means and ends (Is education a means or an end in a situation such as skill-retraining courses for workers displaced by automation?), or on some artificially designed pattern that draws from all these and other classification criteria.⁴⁵

Just what categories constitute the most useful programs and program elements is far from obvious . . . If one puts all educational activities into a broad package of educational programs, he cannot simultaneously include school lunch programs or physical education activities in a Health Program, or include defense educational activities (such as the military academies) in the Defense Program. . . . In short, precisely how to achieve a rational and useful structure for a program budget is not yet evident.⁴⁶

In much current discussion it seems to be taken for granted that transportation is a natural program category. But that conclusion is by no means obvious.⁴⁷

A first question one might ask is whether, given their nature, health activities merit a separate, independent status in a program budget. The question arises because these activities often are constituents of, or inputs into, other activities whose purpose or goal orientation is the dominating one. Outlays by the Department of Defense for hospital care, for example, though they assist in main-

⁴¹ Alan Dean, quoted in D. Novick, *ibid.*, p. 311.

⁴² R. N. McKean and N. Anshen in D. Novick, *ibid.*, pp. 286–87. The authors say that this aspect of program budgeting is part of the general view adopted in the book as a whole.

⁴³ Arthur Smithies in *ibid.*, p. 45.

⁴⁴ A look at the classic work by Luther Gulick and Lyndall Urwick, *Papers on the Science of Administration* (New York, Columbia University Press, 1937), reveals considerable similarity between their suggested bases of organization and ways of conceptualizing programs.

⁴⁵ M. Anshen in D. Novick, *op. cit.*, pp. 19–20.

⁴⁶ M. Anshen in *ibid.*, p. 356.

⁴⁷ A. Smithies in *ibid.*, p. 41.

taining the health of one segment of the population, are undertaken on behalf of national defense, and the latter is their justification.⁴⁸

The difficulties with the program concept are illustrated in the space program. A first glance suggests that space projects are ideally suited for program budgeting because they appear as physical systems designed to accomplish different missions. Actually, there is a remarkable degree of interdependence between different missions and objectives—pride, scientific research, space exploration, military uses, etc.—so that it is impossible to apportion costs on a proper basis. Consider the problem of a rocket developed for one mission and useful for others. To apportion costs to each new mission is purely arbitrary. To allocate the cost to the first mission and regard the rocket as a free good for all subsequent missions is ludicrous. The only remotely reasonable alternative—making a separate program out of the rocket itself—does violence to the concept of programs as end products. The difficulty is compounded because the facilities that have multiple uses like boosters and tracking networks tend to be very expensive compared to the items that are specific to a particular mission.⁴⁹ Simple concepts of programs evaporate upon inspection.

Political realities lie behind the failure to devise principles for defining programs. As Melvin Anshen puts it, "The central issue is, of course, nothing less than the definition of the ultimate objectives of the Federal government as they are realized through operational decisions." The arrangement of the programs inevitably affects the specific actions taken to implement them. "Set in this framework," Anshen continues, "the designation of a schedule of programs may be described as building a bridge between a matter of political philosophy (what is government for?) and . . . assigning scarce resources among alternative governmental objectives."⁵⁰

Because program budgeting is a form of systems analysis (and uses a form of cost-benefit analysis), the conditions that hinder or facilitate its use have largely been covered in the previous sections. The simpler the problem, the fewer the interdependencies, the greater the ability to measure the consequences of alternatives on a common scale, the more costs and benefits that are valued in the market place, the better the chances of making effective use of programs. Let us take transportation to illustrate some of the conditions in a specific case.

Investments in transportation are highly interdependent with one another (planes versus cars versus trains versus barges, etc.) and with decisions regarding the regional location of industry and the movements of population. In view of the powerful effects of transportation investment on regional employment, income, and competition with other modes of transport, it becomes necessary to take these factors into account. The partial equilibrium model of efficiency in the narrow sense becomes inappropriate and a general equilibrium model of the economy must be used. The combination of aggregative models at the economy-wide level and inter-region and inter-industry models that this approach requires is staggering. It is precisely the limited and partial character of cost-effectiveness analyses, taking so much for granted and eliminating many variables, that make them easy to work

⁴⁸ Marvin Frankel in *ibid.*, pp. 219–220. I have forborne citing the author who promises exciting discussion of the objectives of American education and ends up with fascinating program categories like primary, secondary, and tertiary education.

⁴⁹ See the excellent chapter by M. A. Margolis and S. M. Barro, *ibid.*, pp. 120–145.

⁵⁰ *Ibid.*, p. 18.

with for empirical purposes. Furthermore, designing a large-scale transportation system involves so close a mixture of political and economic considerations that it is not possible to disentangle them. The Interstate Highway Program, for example, involved complex bargaining among Federal, State, and local governments and reconciliation of many conflicting interests. The development of certain "backward" regions, facilitating the movement of defense supplies, redistribution of income, creating countervailing power against certain monopolies, not to mention the political needs of public officials, were all involved. While cost-utility exercises might help with small segments of the problem, J. R. Meyer concludes that, "Given the complexity of the political and economic decisions involved, and the emphasis on designing a geographically consistent system, it probably would be difficult to improve on the congressional process as a means of developing such a program in an orderly and systematic way."⁵¹

On one condition for effective use—reorganization of the Federal government to centralize authority for wide-ranging programs—proponents of program budgeting are markedly ambivalent. The problem is that responsibility for programs is now scattered throughout the whole Federal establishment and decentralized to State and local authorities as well. In the field of health, for example, expenditures are distributed among at least twelve agencies and six departments outside of Health, Education, and Welfare. A far greater number of organizations are concerned with American activities abroad, with natural resources and with education. The multiple jurisdictions and overlapping responsibilities do violence to the concept of comprehensive and consistent programs. It "causes one to doubt," Marvin Frankel writes, "whether there can exist in the administrative echelons the kind of overall perspective that would seem indispensable if Federal health resources are to be rationally allocated."⁵² To G. A. Steiner it is evident that "The present 'chest of drawers' type of organization cannot for long be compatible with program budgeting."⁵³ W. Z. Hirsch declares that "if we are to have effective program budgeting of natural resources activities, we shall have to provide for new institutional arrangements."⁵⁴ Yet the inevitable resistance to wholesale reorganization would be so great that, if it were deemed essential, it might well doom the enterprise. Hence, the hope is expressed that translation grids or crossover networks could be used to convert program budget decisions back into the usual budget categories in the usual agencies. That is what is done in Defense, but that Department has the advantage of having most of the activities it is concerned with under the Secretary's jurisdiction. Some program analysts believe that this solution will not do.

Recognizing that a conversion scheme is technically feasible, Anshen is aware that there are "deeply frustrating" issues to be resolved. "The heart of the problem is the fact that the program budget in operation should not be a mere statistical game. Great strategic importance will attach to both the definition of program structure and content and the establishment of specific program objectives (including

⁵¹ J. R. Meyer in *ibid.*, p. 170. This paragraph is based on my interpretation of his work.

⁵² M. Frankel, *ibid.*, p. 237.

⁵³ *ibid.*, p. 348.

⁵⁴ *ibid.*, p. 280.

magnitude, timing, and cost)."⁵⁵ The implications of program budgeting, however, go far beyond specific policies.

It will be useful to distinguish between policy politics (which policy will be adopted?), partisan politics (which political party will win office?), and system politics (how will decision structures be set up?). Program budgeting is manifestly concerned with policy politics, and not much with partisan politics, although it could have important consequences for issues that divide the nation's parties. *My contention is that the thrust of program budgeting makes it an integral part of system politics.*

As presently conceived, program budgeting contains an extreme centralizing bias. Power is to be centralized in the Presidency (through the Budget Bureau) at the national level, in superdepartments rather than bureaus within the executive branch, and in the Federal government as a whole instead of State or local governments. Note how W. Z. Hirsch assumes the desirability of national dominance when he writes: "These methods of analysis can guide Federal officials in the responsibility of bringing local education decisions into closer harmony with national objectives."⁵⁶ G. A. Steiner observes that comprehensiveness may be affected by unrestricted Federal grants-in-aid to the states because "such a plan would remove a substantial part of Federal expenditures from a program budgeting system of the Federal government."⁵⁷ Should there be reluctance on the part of State and local officials to employ the new tools, Anshen states "that the Federal government may employ familiar incentives to accelerate this progress."⁵⁸ Summing it up, Hirsch says that "It appears doubtful that a natural resources program budget would have much impact without a good deal of centralization."⁵⁹

Within the great Federal organizations designed to encompass the widest ramifications of basic objectives, there would have to be strong executives. Cutting across the sub-units of the organization, as is the case in the Department of Defense, the program budget could only be put together by the top executive. A more useful tool for increasing his power to control decisions vis-a-vis his subordinates would be hard to find.⁶⁰

Would large-scale program budgeting benefit the Chief Executive? President Johnson's support of program budgeting could in part stem from his desire to appear frugal and also be directed at increasing his control of the executive branch by centralizing decisions in the Bureau of the Budget. In the case of foreign affairs, it is not at all clear whether it would be preferable to emphasize country teams, with the budget made by the State Department to encompass activities of the other Federal agencies abroad, or to let Commerce, Agriculture, Defense, and other agencies include their foreign activities in their own budgets. Program budgeting will unleash great struggles of this kind in Washington. An especially intriguing possibility is that the Bureau of the Budget might prefer to let the various agencies compete, with the Bureau coordinating (that is, controlling) these activities through

⁵⁵ *Ibid.*, pp. 358-59.

⁵⁶ *Ibid.*, p. 208.

⁵⁷ *Ibid.*, p. 347.

⁵⁸ *Ibid.*, p. 365.

⁵⁹ *Ibid.*, p. 280.

⁶⁰ See my comments to this effect in *The Politics of the Budgetary Process* (Boston, 1964), p. 140. For discussion of some political consequences of program budgeting, see pp. 135-142.

a comprehensive foreign affairs program devised only at the Presidential level.

Yet it is not entirely clear that Presidents would welcome all the implications of program budgeting. It is well and good to talk about long-range planning; it is another thing to tie a President's hands by committing him in advance for five years of expenditures. Looking ahead is fine but not if it means that a President cannot negate the most extensive planning efforts on grounds that seem sufficient to him.⁶¹ He may wish to trade some program budgeting for some political support.

In any event, that all decisions ought to be made by the most central person in the most centralized body capable of grabbing hold of them is difficult to justify on scientific grounds. We see what has happened. First pure efficiency was converted to mixed efficiency. Then limited efficiency became unlimited. Yet the qualifications of efficiency experts for political systems analysis are not evident.⁶²

We would be in a much stronger position to predict the consequences of program budgeting if we knew (a) how far toward a genuine program budget the Defense Department has gone and (b) whether the program budget has fulfilled its promise. To the best of my knowledge, not a single study of this important experiment was undertaken (or at least published) before the decision was made to spread it around the land. On the surface, only two of the nine program categories used in the Defense Department appear to be genuine programs in the sense of pointing to end purposes or objectives. Although strategic retaliation and continental defense appear to be distinct programs, it is difficult to separate them conceptually; my guess is that they are, in fact, considered together. The third category—general purpose forces—is presumably designed to deal with (hopefully) limited war anywhere in the world. According to Arthur Smithies, "The threat is not clearly defined and neither are the requirements for meeting it. Clearly this program is of a very different character from the other two and does not lend itself as readily to analysis in terms either of its components or of its specific contribution to defense objectives."⁶³

What about the program called airlift and sealift? These activities support the general purpose forces. Research and development is car-

⁶¹ See William H. Brown and Charles E. Gilbert, *Planning Municipal Investment: A Case Study of Philadelphia* (Philadelphia, University of Pennsylvania Press, 1961), for an excellent discussion of the desire of elected officials to remain free to shift their commitments.

⁶² It may be said that I have failed to distinguish sufficiently between planning, programming, and budgeting. Planning is an orientation that looks ahead by extending costs and benefits or units of effectiveness a number of years into the future. Programming is a general procedure of systems analysis employing cost-effectiveness studies. In this view program budgeting is a mere mechanical translation of the results of high level systems studies into convenient storage in the budgetary format. No doubt systems studies could be done without converting the results into the form of a program budget. This approach may have a lot to be said for it and it appears that it is the one that is generally followed in the Department of Defense in its presentations to Congress. But if the systems studies guide decisions as to the allocation of resources, and the studies are maintained according to particular program categories and are further legitimized by being given status in the budget, it seems most unlikely that programming will be separated from budgeting. One is never sure whether too much or too little is being claimed for program budgeting. If all that program budgeting amounts to is a simple translation of previous systems studies into some convenient form of accounting, it hardly seems that this phenomenon is worth so much fuss. If the program categories in the budget system are meaningful, then they must be much more than a mere translation of previously arrived at decisions. In this case, I think that it is not my task to enlighten the proponents of program budgeting, but it is their task to make themselves clear to others.

⁶³ A. Smithies in Novick, *op. cit.*, p. 37.

ried on presumably to serve other defense objectives, and the same is true for the reserve forces.

No doubt the elements that make up the programs comprise the real action focus of the budget, but these may look less elegant when spread into thousands of elements than they do in nine neat rows. When one hears that hundreds of program elements are up for decision at one time,⁶⁴ he is entitled to some skepticism about how much genuine analysis can go into all of them. Part of the argument for program budgeting was that by thinking ahead and working all year around it would be possible to consider changes as they came up and avoid the usual last minute funk. Both Hitch⁶⁵ and Novick⁶⁶ (the RAND Corporation expert on defense budgeting) report, however, that this has not worked out. The services hesitate to submit changes piecemeal, and the Secretary wants to see what he is getting into before he acts. The vaunted five year plans are still in force but their efficacy in determining yearly decisions remains to be established.

One good operational test would be to know whether the Department's systems analysts actually use the figures from the five year plans in their work or whether they go to the services for the real stuff. Another test would be whether or not the later years of the five year projections turn out to have any future significance, or whether the battle is really over the next year that is to be scooped out as part of the budget. From a distance, it appears that the services have to work much harder to justify what they are doing. Since McNamara's office must approve changes in defense programs, and he can insist on documentation, he is in a strong position to improve thinking at the lower levels. The intensity of conflict within the Defense Department may not have changed, but it may be that the disputants are or will in the future be likely to shout at a much more sophisticated level. How much this is due to McNamara himself, to his insistence on quantitative estimates, or to the analytic advantages of a program budget cannot be determined now. It is clear that a program budget, of which he alone is master, has helped impose his will on the Defense Department.

It should also be said that there are many notable differences between decision-making in defense and domestic policy that would render suspect the transmission of procedures from one realm to the other. The greater organizational unity of Defense, the immensely large amounts of money at stake, the extraordinarily greater risks involved, the inability to share more than minimal values with opponents, the vastly different array of interests and perceptions of the proper roles of the participants, are but a few of the factors involved.

The Armed Services and Appropriations Committees in the defense area, for example, are normally most reluctant to substitute their judgment on defense for that of the President and the Secretary of the Department. They do not conceive it to be their role to make day to day defense policy, and they are apparently unwilling to take on the burden of decision. They therefore accept a budget presentation based on cavernous program categories even though these are so ar-

⁶⁴ See U.S. House Appropriations Committee Subcommittee on Department of Defense Appropriations for Fiscal 1965, 88th Congress, 2nd Session, IV, p. 133. McNamara asserted that some 652 "subject issues" had been submitted to him for the fiscal 1965 budget.

⁶⁵ Charles Hitch, *Decision Making for Defense* (Berkeley, University of California Press, 1965).

⁶⁶ Novick, *op. cit.*, p. 100.

ranged that it is impossible to make a decision on the basis of them. If they were to ask for and to receive the discussion of alternative actions contained in the much smaller program elements on which McNamara bases his decisions, they would be in a position to take the Department of Defense away from its Secretary.

There is no reason whatsoever to believe that a similar restraint would be shown by committees that deal with domestic policies. It is at least possible that the peculiar planning, programming, and budgeting system adopted in defense could not be repeated elsewhere in the federal establishment.

POLITICAL RATIONALITY

Political rationality is the fundamental kind of reason, because it deals with the preservation and improvement of decision structures, and decision structures are the source of all decisions. Unless a decision structure exists, no reasoning and no decisions are possible. . . . There can be no conflict between political rationality and . . . technical, legal, social, or economic rationality, because the solution of political problems makes possible an attack on any other problem, while a serious political deficiency can prevent or undo all other problem solving. . . . Non-political decisions are reached by considering a problem in its own terms, and by evaluating proposals according to how well they solve the problem. The best available proposal should be accepted regardless of who makes it or who opposes it, and a faulty proposal should be rejected or improved no matter who makes it. Compromise is always irrational; the rational procedure is to determine which proposal is the best, and to accept it. In a political decision, on the other hand, action never is based on the merits of a proposal but always on who makes it and who opposes it. Action should be designed to avoid complete identification with any proposal and any point of view, no matter how good or how popular it might be. The best available proposal should never be accepted just because it is best; it should be deferred, objected to, discussed, until major opposition disappears. Compromise is always a rational procedure, even when the compromise is between a good and a bad proposal.⁶⁷

We are witnessing the beginning of significant advances in the art and science of economizing. Having given up the norm of comprehensiveness, economizers are able to join quantitative analysis with aids to calculation of the kind described by Lindblom in his strategy of disjointed incrementalism.⁶⁸

Various devices are employed to simplify calculations. Important values are omitted entirely; others are left to different authorities to whose care they have been entrusted. Here, sensitivity analysis represents an advance because it provides an empirical basis to justify neglect of some values. Means and ends are hopelessly intertwined.

The real choice is between rival policies that encapsulate somewhat different mixes of means and ends. Analysis proceeds incrementally by successive limited approximations. It is serial and remedial as successive attacks are made on problems. Rather than waiting upon experience in the real world, the analyst tries various moves in his model and runs them through to see if they work. When all else fails, the analyst may try an integrative solution reconciling a variety of values to some degree, though meeting none of them completely. He is always ready to settle for the second or third best, provided only that it is better than the going policy. Constrained by diverse limiting

⁶⁷ Paul Diesing, *Reason in Society* (Urbana, 1962), pp. 198, 203-4, 231-32.

⁶⁸ Braybrooke and Lindblom, *op. cit.* See also Lindblom, *The Intelligence of Democracy* (New York, 1965).

assumptions, weakened by deficiencies in technique, rarely able to provide unambiguous measures, the systems, cost-benefit, and program analysis is nonetheless getting better at calculating in the realm of efficiency. Alas, he is an imperialist at heart.

In the literature discussed above there appears several times the proposition that "the program budget is a neutral tool. It has no politics."⁶⁹ In truth, the program budget is suffused with policy politics, makes up a small part of President Johnson's partisan politics, and tends towards system politics. How could men account for so foolish a statement? It must be that they who make it identify program budgeting with something good and beautiful, and politics with another thing bad and ugly. McKean and Anshen speak of politics in terms of "pressure and expedient adjustments," "haphazard acts . . . unresponsive to a planned analysis of the needs of efficient decision design." From the political structure they expect only "resistance and opposition, corresponding to the familiar human disposition to protect established seats of power and procedures made honorable by the mere facts of existence and custom."⁷⁰ In other places we hear of "vested interests," "wasteful duplication," "special interest groups," and the "Parkinson syndrome."⁷¹

Not so long ago less sophisticated advocates of reform ignored the political realm. Now they denigrate it. And, since there must be a structure for decision, it is smuggled in as a mere adjunct of achieving efficiency. Who is to blame if the economic tail wags the political dog? It seems unfair to blame the evangelical economizer for spreading the gospel of efficiency. If economic efficiency turns out to be the one true religion, maybe it is because its prophets could so easily conquer.

It is hard to find men who take up the cause of political rationality, who plead the case for political man, and who are primarily concerned with the laws that enable the political machinery to keep working. One is driven to a philosopher like Paul Diesing to find the case for the political:

. . . the political problem is always basic and prior to the others. . . . This means that any suggested course of action must be evaluated first by its effects on the political structure. A course of action which corrects economic or social deficiencies but increases political difficulties must be rejected, while an action which contributes to political improvement is desirable even if it is not entirely sound from an economic or social standpoint.⁷²

There is hardly a political scientist who would claim half as much. The desire to invent decision structures to facilitate the achievement of economic efficiency does not suggest a full appreciation of their proper role by students of politics.

A major task of the political system is to specify goals or objectives. It is impermissible to treat goals as if they were known in advance. "Goals" may well be the product of interaction among key participants rather than some "deus ex machina" or (to use Bentley's term) some "spook" which posits values in advance of our knowledge of them. Certainly, the operational objectives of the Corps of Engineers in the Water Resources field could hardly be described in terms of developing rivers and harbors.

⁶⁹ M. Anshen in D. Novick, *op. cit.*, p. 370.

⁷⁰ *Ibid.*, p. 289.

⁷¹ *Ibid.*, p. 359.

⁷² Paul Diesing, *op. cit.*, p. 228.

Once the political process becomes a focus of attention, it is evident that the principal participants may not be clear about their goals. What we call goals or objectives may, in large part, be operationally determined by the policies we can agree upon. The mixtures of values found in complex policies may have to be taken in packages, so that policies may determine goals at least as much as general objectives determine policies. In a political situation, then, the need for support assumes central importance. Not simply the economic, but the *political* costs and benefits turn out to be crucial.

A first attempt to specify what is meant by political costs may bring closer an understanding of the range of requirements for political rationality.⁷³ Exchange costs are incurred by a political leader when he needs the support of other people to get a policy adopted. He has to pay for this assistance by using up resources in the form of favors (patronage, logrolling) or coercive moves (threats or acts to veto or remove from office). By supporting a policy and influencing others to do the same, a politician antagonizes some people and may suffer their retaliation. If these hostility costs mount, they may turn into reelection costs—actions that decrease his chances (or those of his friends) of being elected or reelected to office. Election costs, in turn, may become policy costs through inability to command the necessary formal powers to accomplish the desired policy objectives.

In the manner of Neustadt, we may also talk about reputation costs, i.e. not only loss of popularity with segments of the electorate, but also loss of esteem and effectiveness with other participants in the political system and loss of ability to secure policies other than the one immediately under consideration. Those who continually urge a President to go all out—that is, use all his resources on a wide range of issues—rarely stop to consider that the price of success in one area of policy may be defeat in another. If he loses popularity with the electorate, as President Truman did, Congress may destroy almost the whole of his domestic program. If he cracks down on the steel industry, as President Kennedy did, he may find himself constrained to lean over backwards in the future to avoid unremitting hostility from the business community.

A major consequence of incurring exchange and hostility costs may be undesirable power-redistribution effects. The process of getting a policy adopted or implemented may increase the power of various individuals, organizations and social groups, which later will be used against the political leader. The power of some participants may be weakened so that the political leader is unable to enjoy their protection.

The legitimacy of the political system may be threatened by costs that involve the weakening of customary political restraints. Politicians who try to suppress opposition, or who practice election frauds, may find similar tactics being used against them. The choice of a highly controversial policy may raise the costs of civic discord. Although the people involved may not hate the political leader, the fact that they hate each other may lead to consequences contrary to his desires.

The literature of economics usually treats organizations and institutions as if they were costless entities. The standard procedure is to con-

⁷³ I am indebted to John Harsanyi for suggestions about political rationality.

sider rival alternatives (in consideration of price policy or other criteria), calculate the differences in cost and achievement among them, and show that one is more or less efficient than another. This typical way of thinking is sometimes misspecified. If the costs of pursuing a policy are strictly economic and can be calculated directly in the market place, then the procedure should work well. But if the costs include getting one or another organization to change its policies or procedures, then these costs must also be taken into account.⁷⁴ Perhaps there are legal, psychological, or other impediments that make it either impossible or difficult for the required changes to be made. Or the changes may require great effort and result in incurring a variety of other costs. In considering a range of alternatives, one is measuring not only efficiency but also the cost of change.

Studies based on efficiency criteria are much needed and increasingly useful. My quarrel is not with them as such, at all. I have been concerned that a single value, however important, could triumph over other values without explicit consideration being given these others. I would feel much better if political rationality were being pursued with the same vigor and capability as is economic efficiency. In that case I would have fewer qualms about extending efficiency studies into the decision-making apparatus.

My purpose has not been to accuse economizers of doing what comes naturally. Rather, I have sought to emphasize that economic rationality, however laudible in its own sphere, ought not to swallow up political rationality—but will do so, if political rationality continues to lack trained and adept defenders.

⁷⁴ In the field of defense policy, political factors are taken into account to the extent that the studies concentrate on the design of feasible alternatives. In the choice of overseas basing, for example, the question of feasibility in relation to treaties and friendly or unfriendly relationships with other countries is considered. Thus it seems permissible to take into account political considerations originating outside of the country, where differences of opinions and preferences among nations are to some extent accepted as legitimate, but apparently not differences internal to the American policy.

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RESCUING POLICY ANALYSIS FROM PPBS

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INTRODUCTORY NOTE

In the 90th Congress, the Subcommittee on National Security and International Operations conducted the first major congressional inquiry into the planning-programming-budgeting system, and the subcommittee is continuing to monitor the application of program budgeting and analysis in national security affairs. We will seek to bring to the attention of the Congress from time to time informed comment and independent evaluation.

In this connection, we are pleased to be able to reprint this article by Dr. Aaron Wildavsky on the need for improved policy analysis in governmental decision-making. The issues raised by Dr. Wildavsky warrant serious consideration and frank discussion. We are grateful to the author and to the editors of the *Public Administration Review* for their cooperation in giving us permission to publish this article in the record of the subcommittee.

Dr. Wildavsky is Professor and Chairman of the Department of Political Science and Member of the Center for Planning and Development Research at the University of California, Berkeley. Distinguished analyst of budgeting, he is author of *The Politics of the Budgetary Process* (1964) and other recent studies.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

APRIL 8, 1969.

RESCUING POLICY ANALYSIS FROM PPBS

By

Aaron Wildavsky

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Everyone knows that the nation needs better policy analysis. Each area one investigates shows how little is known compared to what is necessary in order to devise adequate policies. In some organizations there are no ways at all of determining the effectiveness of existing programs; organizational survival must be the sole criterion of merit. It is often not possible to determine whether the simplest objectives have been met. If there is a demand for information the cry goes out that what the organization does cannot be measured. Should anyone attempt to tie the organization down to any measure of productivity, the claim is made that there is no truth in numbers. Oftentimes this is another way of saying, "Mind your own business." Sometimes the line taken is that the work is so subtle that it resists any tests. On other occasions the point is made that only those learned in esoteric arts can properly understand what the organization does, and they can barely communicate to the uninitiated. There are men so convinced of the ultimate righteousness of their cause that they cannot imagine why anyone would wish to know how well they are doing in handling our common difficulties. Their activities are literally priceless; vulgar notions of cost and benefit do not apply to them.

Anyone who has weathered this routine comes to value policy analysis. The very idea that there should be some identifiable objectives and that attention should be paid to whether these are achieved seems a great step forward. Devising alternative ways of handling problems and considering the future costs of each solution appear creative in comparison to more haphazard approaches. Yet policy analysis with its emphasis upon originality, imagination, and foresight, cannot be simply described. It is equivalent to what Robert N. Anthony has called strategic planning: ". . . the process of deciding on objectives of the organization, on changes in these objectives, on the resources used to attain these objectives. . . . It connotes big plans, important plans, plans with major consequences."¹ While policy analysis is similar to a broadly conceived version of systems analysis,² Yehezkel Dror has pointed up the boundaries that separate a narrow study from one with larger policy concerns. In policy analysis,

1. Much attention would be paid to the political aspects of public decision-making and public policy-making (instead of ignoring or condescendingly regarding political aspects). . . .

2. A broad conception of decision-making and policy-making would be involved (instead of viewing all decision-making as mainly a resources allocation). . . .

3. A main emphasis would be on creativity and search for new policy alternatives, with explicit attention to encouragement of innovative thinking. . . .

¹ Robert N. Anthony, *Planning and Control Systems: A Framework for Analysis*, (Boston: Harvard University Press, 1965), p. 16.

² Aaron Wildavsky, "The Political Economy of Efficiency," *PUBLIC ADMINISTRATION REVIEW*, Vol. XXVI, No. 4, December 1966, pp. 298-302.

4. There would be extensive reliance on . . . qualitative methods. . . .
5. There would be much more emphasis on futuristic thinking. . . .
6. The approach would be looser and less rigid, but nevertheless systematic, one which would recognize the complexity of means-ends interdependence, the multiplicity of relevant criteria of decision, and the partial and tentative nature of every analysis. . . .³

Policy analysis aims at providing information that contributes to making an agency politically and socially relevant. Policies are goals, objectives, and missions that guide the agency. Analysis evaluates and sifts alternative means and ends in the elusive pursuit of policy recommendations. By getting out of the fire-house environment of day-to-day administration, policy analysis seeks knowledge and opportunities for coping with an uncertain future. Because policy analysis is not concerned with projecting the *status quo*, but with tracing out the consequences of innovative ideas, it is a variant of planning. Complementing the agency's decision process, policy analysis is a tool of social change.

In view of its concern with creativity, it is not surprising that policy analysis is still largely an art form; there are no precise rules about how to do it. The policy analyst seeks to reduce obscurantism by being explicit about problems and solutions, resources and results. The purpose of policy analysis is not to eliminate advocacy but to raise the level of argument among contending interests. If poor people want greater benefits from the government, the answer to their problems may not lie initially in policy analysis but in political organization. Once they have organized themselves, they may want to undertake policy analysis in order to crystallize their own objectives or merely to compete with the analyses put forth by others. The end result, hopefully, would be a higher quality debate and perhaps eventually public choice among better known alternatives.

A belief in the desirability of policy analysis—the sustained application of intelligence and knowledge to social problems—is not enough to insure its success, no more than to want to do good is sufficient to accomplish noble purposes. If grandiose claims are made, if heavy burdens are placed on officials without adequate compensation, if the needs of agency heads are given scant consideration, they will not desire policy analysis. It is clear that those who introduced the PPB system into the federal government in one fell swoop did not undertake a policy analysis on how to introduce policy analysis into the federal government.

In a paper called "The Political Economy of Efficiency,"⁴ written just as PPBS was begun in national government, I argued that it would run up against serious difficulties. There is still no reason to change a single word of what I said then. Indeed, its difficulties have been so overwhelming that there is grave danger that policy analysis will be rejected along with its particular manifestation in PPBS. In this essay I shall assess the damage that the planning-programming-budgeting system has done to the prospects of encouraging policy analysis in American national government. Then I would like to suggest some ways of enabling policy analysis to thrive and prosper.

³ Yehezkel Dror, "Policy Analysts: A New Professional Role in Government Service," *PUBLIC ADMINISTRATION REVIEW*, Vol. XXVII, No. 3, September 1967, pp. 200-201. See also Dror's major work, *Public Policy-Making Reexamined* (San Francisco: Chandler, 1968).

⁴ Aaron Wildavsky, *op. cit.*

WHY DEFENSE WAS A BAD MODEL

A quick way of seeing what went wrong with PPBS is to examine the preconditions for the use of this approach in the Defense Department, from which it was exported throughout the federal government. The immediate origins of PPBS are to be found in The RAND Corporation,⁵ where, after the Second World War, a talented group of analysts devoted years of effort to understanding problems of defense policy. It took five years to come up with the first useful ideas. Thus the first requisite of program budgeting in Defense was a small group of talented people who had spent years developing insights into the special problems of defense strategy and logistics. The second requisite was a common terminology, an ad hoc collection of analytical approaches, and the beginnings of theoretical statements to guide policy analysis. When Secretary of Defense Robert McNamara came into office, he did not have to search for men of talent nor did he have to wait for a body of knowledge to be created. These requisites already existed in some degree. What was further necessary was his ability to understand and to use analytical studies. Thus the third requisite of program budgeting is top leadership that understands policy analysis and is determined to get it and make use of it.

The fourth requisite was the existence of planning and planners. Planning was well accepted at the various levels of the Defense Department with the variety of joint service plans, long-range requirement plans, logistical plans, and more. Military and civilians believed in planning, in coping with uncertainty and in specifying some consequences of policy decisions. The problem as the originators of PPBS saw it was to introduce cost considerations into planning; they wanted to stop blue-sky planning and to integrate planning and budgeting. They wanted to use the program budget to bridge the gap between military planners, who cared about requirements but not about resources, and budget people, who were narrowly concerned with financial costs but not necessarily with effective policies.

Policy analysis is expensive in terms of time, talent, and money. It requires a high degree of creativity in order to imagine new policies and to test them out without requiring actual experience. Policy analysis calls for the creation of systems in which elements are linked to one another and to operational indicators so that costs and effectiveness of alternatives may be systematically compared. There is no way of knowing in advance whether the analysis will prove intellectually satisfying and politically feasible. Policy analysis is facilitated when: (a) goals are easily specified, (b) a large margin of error is allowable, and (c) the cost of the contemplated policy makes large expenditures on analysis worthwhile. That part of defense policy dealing with choices among alternative weapons systems was ideally suited for policy analysis. Since the cost of intercontinental missiles or other weapons systems ran into the billions of dollars, it was easy to justify spending millions on analysis.⁶ The potential effectiveness of weapons like intercontinental missiles could be contemplated so long as one was willing to accept large margins of error. It is not unusual for analysts to assume extreme cases of damage and vulnerability in a

⁵ See David Novick, "Origin and History of Program Budgeting," The RAND Corporation, October 1966, P-3427.

⁶ I once tried to interest a graduate student who had experience with defense problems in doing research in the City of Oakland. He asked the size of Oakland's budget. "Fifty million dollars," I said. "Why, in the Air Force we used to round to that figure," was his reply.

context in which the desire for reducing risk is very great. Hence a goal like assuring sufficient destructive power such that no enemy strike could prevent devastation of one's country may be fuzzy without being unusable. If one accepts a procedure of imagining that possible enemies were to throw three times as much megatonnage as intelligence estimates suggest they have, he need not be overly troubled by doubts about the underlying theory. If one is willing to pay the cost of compensating against the worst, lack of knowledge will not matter so much. The point is not that this is an undesirable analytic procedure, quite the contrary, but the extreme cases were allowed to determine the outcomes.

Inertia

The introduction of new procedures that result in new policies is not easy. Inertia is always a problem. Members of the organization and its clientele groups have vested interests in the policies of the past. Efforts at persuasion must be huge and persistent. But there are conditions that facilitate change. One of these is a rising level of appropriations. If change means that things must be taken away from people in the organization without giving them anything in return, greater resistance may be expected. The ability to replace old rewards with larger new ones helps reduce resistance to change. The fact that defense appropriations were increasing at a fast rate made life much easier for Mr. McNamara. The expected objections of clientele groups, for example, were muted by the fact that defense contractors had lots of work, even if it was not exactly what they expected. Rapid organizational growth may also improve the possibilities for change. The sheer increase in organizational size means that many new people can be hired who are not tied to the old ways. And speedy promotion may help convince members that the recommended changes are desirable.

The deeper change goes into the bowels of the organization, the more difficult it is to achieve. The more change can be limited to central management, the greater the possibility for carrying it out. The changes introduced in the Defense Department did not, for the most part, require acceptance at the lower levels. Consider a proposed change in the organization of fighting units that would drastically reduce the traditional heavy support facilities for ground forces. Such a change is not easily manipulated from Washington. But the choice of one weapons system over another is much more amenable to central control. The kinds of problems for which program budgeting was most useful also turned out to be problems that could be dealt with largely at the top of the organization. The program budget group that McNamara established had to fight with generals in Washington but not with master sergeants in supply. Anyone who knows the Army knows what battle they would rather be engaged in fighting.

The ability of an organization to secure rapid change depends, of course, on the degree of its autonomy from the environment. I have argued elsewhere⁷ that the President of the United States has much more control over America's foreign policy than over its domestic policy. In almost any area of domestic policy there is a well-entrenched structure of interests. In foreign and defense policy, excluding such essentially internal concerns as the National Guard, the territory within the American political system is not nearly so well defended; there are far fewer political fortifications, mines, and boobytraps.

⁷ Aaron Wildavsky, "The Two Presidencies," *Trans-action*, Vol. IV, No. 2, December 1966, pp. 7-14.

Personnel

Experienced personnel may be a barrier to change. They know something about the consequences of what they are doing. They may have tried a variety of alternatives and can point to reasons why each one will not work. If I may recall my low-level Army experience (I entered as a private first class and was never once demoted), the usual reply to a question about the efficacy of present practice was, "Have you ever been in combat, son?" But the most dramatic changes introduced in the Pentagon had to do with questions of avoiding or limiting nuclear war, in which no one had a claim to experience and in which the basic purpose of analysis is to make certain that we do not have to learn from experience. If the system fails, the game is over. And since McNamara's men possessed a body of doctrines on defense policy, they had an enormous advantage over regular military who were for a long time unable to defend themselves properly in the new field.⁸

The new policy analysts did not accept the currency of military experience. In their view, naked judgment was not a satisfactory answer to why a policy should be adopted. The Army might know the fire-power of an infantry division, but fire-power was not "effectiveness." Competition among the services for appropriations, however, was favorable to PPBS. There was a defense budget that covered virtually all of the Department's subject matter. There were defense missions in which trade-offs could be made between the services. Resources could actually be diverted if the analysis "proved" a particular service was right. Programs could easily be developed because of the facile identification of program with weapons systems and force units. Once the military learned the jargon, they were willing to play the game for an extra division or carrier. So long as dollar losses in one program were more than made up by gains in another, the pain of policy analysis was considerably eased.

The favorable conditions for the limited use of program budgeting in the Department of Defense do not exist in most domestic agencies. There are no large groups of talented policy analysts expert in agency problems outside of the federal government. These nonexistent men cannot, therefore, be made available to the agencies. (The time has passed when eighth-rate systems engineers in aerospace industries are expected to solve basic social problems overnight.) Most agencies had few planners and even less experience in planning. There is no body of knowledge waiting to be applied to policy areas such as welfare and crime. A basic reason for wanting more policy analysis is to help create knowledge where little now exists. There are only a few agencies in which top managers want systematic policy analysis and are able to understand quantitative studies. Goals are not easily specified for most domestic agencies. Nor do they usually have handy equivalents for programs like expensive weapons systems. What Thomas Schelling has so pungently observed about the Department of State—it does not control a large part of the budget devoted to foreign policy—is true for the domestic departments and their lack of coverage as well.⁹

⁸ For further argument along these lines see my article, "The Practical Consequences of the Theoretical Study of Defense Policy," *PUBLIC ADMINISTRATION REVIEW*, Vol. XXV, No. 1, March 1965, pp. 90-103.

⁹ Thomas C. Schelling, "PPBS and Foreign Affairs," memorandum prepared at the request of the Subcommittee on National Security and International Operations of the Committee on Government Operations, U.S. Senate, 90th Congress, First Session, 1968.

Except for a few individual programs like the proposals for income supplements or assessing the desirability of a supersonic transport, the cost of most domestic policies does not rise into the billions of dollars. Congress and interested publics are not disposed to allow large margins of error. Instead of increasing, the availability of federal funds began declining soon after the introduction of program budgeting. A higher level of conflict was inevitable, especially since the acceptance of proposed changes required the acquiescence of all sorts of people and institutions in the farflung reaches of the agencies. Social workers, city officials, police chiefs, welfare mothers, field officers, and numerous others were involved in the policies. Program budgeting on the domestic side takes place in a context in which there is both less autonomy from the environment and a great deal more first-hand experience by subordinates. On these grounds alone no one should have been surprised that program budgeting in the domestic agencies did not proceed as rapidly or with as much ostensible success as in the Defense Department.¹⁰

NO ONE CAN DO PPBS

In past writings I argued that program budgeting would run up against severe political difficulties. While most of these arguments have been conceded, I have been told that in a better world, without the vulgar intrusion of political factors (such as the consent of the governed), PPBS would perform its wonders as advertised. Now it is clear that for the narrow purpose of predicting why program budgeting would not work there was no need to mention political problems at all. It would have been sufficient to say that the wholesale introduction of PPBS presented insuperable difficulties of calculation. All the obstacles previously mentioned, such as lack of talent, theory, and data, may be summed up in a single statement: *no one knows how to do program budgeting*. Another way of putting it would be to say that many know what program budgeting should be like in general, but no one knows what it should be in any particular case. Program budgeting cannot be stated in operational terms. There is no agreement on what the words mean, let alone an ability to show another person what should be done. The reason for the difficulty is that telling an agency to adopt program budgeting means telling it to find better policies and there is no formula for doing that. One can (and should) talk about measuring effectiveness, estimating costs, and comparing alternatives, but that is a far cry from being able to take the creative leap of formulating a better policy.

Pattern of Events

On the basis of numerous discussions with would-be practitioners of program budgeting at the federal level, I think I can describe the usual pattern of events. The instructions come down from the Bureau

¹⁰ Dr. Alain Enthoven, who played a leading role in introducing systems analysis to the Defense Department, has observed that: "The major changes in strategy, the step-up in production of Minutemen and Polaris and the build-up in our non-nuclear forces including the increase in the Army, the tactical air forces, and the air lift . . . were being phased in at the same time that PPBS was being phased in. . . . We speeded up the Polaris and Minuteman programs because we believed that it was terribly important to have an invulnerable retaliatory force. We built up the Army Land Forces because we believed it was necessary to have more land forces for limited non-nuclear wars. We speeded up the development of anti-guerrilla forces or special forces because we believed that was necessary for counter-insurgency. Those things would have happened with or without PPBS. PPBS does not make the strategy." Subcommittee on National Security and International Operations of the Committee on Government Operations, U.S. Senate, *Hearings, Planning-Programming-Budgeting*, 90th Congress, First Session, Part 2, Sept. 27 and Oct. 18, 1967, p. 295.

of the Budget. You must have a program budget. Agency personnel hit the panic button. They just do not know how to do what they have been asked to do. They turn, if they can, to the pitifully small band of refugees from the Pentagon who have come to light the way. But these defense intellectuals do not know much about the policy area in which they are working. That takes time. Yet something must quickly come out of all this. So they produce a vast amount of inchoate information characterized by premature quantification of irrelevant items. Neither the agency head nor the examiners in the Bureau of the Budget can comprehend the material submitted to them. Its very bulk inhibits understanding. It is useless to the Director of the Budget in making his decisions. In an effort to be helpful, the program analysis unit at the Budget Bureau says something like, "Nice try, fellows; we appreciate all that effort. But you have not quite got the idea of program budgeting yet. Remember, you must clarify goals, define objectives, relate these to quantitative indicators, project costs into the future. Please send a new submission based on this understanding."

Another furious effort takes place. They do it in Defense, so it must be possible. Incredible amounts of overtime are put in. Ultimately, under severe time pressure, even more data is accumulated. No one will be able to say that agency personnel did not try hard. The new presentation makes a little more sense to some people and a little less to others. It just does not hang together as a presentation of agency policies. There are more encouraging words from the Budget Bureau and another sermon about specifying alternative ways of meeting agency objectives, though not, of course, taking the old objectives for granted. By this time agency personnel are desperate. "We would love to do it," they say, "but we cannot figure out the right way. You experts in the Budget Bureau should show us how to do it." Silence. The word from on high is that the Bureau of the Budget does not interfere with agency operations; it is the agency's task to set up its own budget. After a while, cynicism reigns supreme.

PPBS must be tremendously inefficient. It resembles nothing so much as a Rube Goldberg apparatus in which the operations performed bear little relation to the output achieved. The data inputs into PPBS are huge and its policy output is tiny. All over the federal government the story is the same: if you ask what good has PPBS done, those who have something favorable to say invariably cite the same one or two policy analyses. At one time I began to wonder if the oil shale study¹¹ in the Interior Department and the maternal and child health care program¹² in Health, Education, and Welfare were all that had ever come out of the programming effort.

The orders to expand PPBS did not say, "Let us do more policy analysis than we have in the past." What it said was, "Let us make believe we can do policy analysis on everything." Instead of focusing attention on areas of policy amenable to study, the PPBS apparatus requires information on *all* agency policies.

Program Structure

The fixation on program structure is the most pernicious aspect of PPBS. Once PPBS is adopted, it becomes necessary to have a program structure that provides a complete list of organization objectives and

¹¹ *Prospects For Oil Shale Development* (Washington, D.C.: Department of the Interior, May 1968).

¹² The study is presented in Joint Economic Committee, Congress of the United States, *Hearings, The Planning-Programming-Budgeting System: Progress and Potentials*, 90th Congress, First Session, September 1967, pp. 10-45.

supplies information on the attainment of each one. In the absence of analytic studies for all or even a large part of an agency's operations, the structure turns out to be a sham that piles up meaningless data under vague categories.¹³ It hides rather than clarifies. It suggests comparisons among categories for which there is no factual or analytical basis. Examination of a department's program structure convinces everyone acquainted with it that policy analysis is just another bad way of masquerading behind old confusions. A mere recitation of some program categories from the Department of Agriculture—Communities of Tomorrow, Science in the Service of Man, Expanding Dimensions for Living—makes the point better than any comment.

Even if the agency head does understand a data-reduction-summation of the program budget, he still cannot use the structure to make decisions, because it is too hard to adjust the elaborate apparatus. Although the system dredges up information under numerous headings, it says next to nothing about the impact of one program on another. There is data but no causal analysis. Hence the agency head is at once oversupplied with masses of numbers and undersupplied with propositions about the impact of any action he might undertake. He cannot tell, because no one knows, what the marginal change he is considering would mean for the rest of his operation. Incremental changes at the Bureau of the Budget at the agency level are made in terms of the old budget categories. Since the program structure is meant to be part of the budget, however, it must be taken as a statement of current policy and it necessarily emerges as a product of organizational compromise. The program structure, therefore, does not embody a focus on central policy concerns. More likely, it is a haphazard arrangement that reflects the desire to manipulate external support and to pursue internal power aspirations. Being neither program nor budget, program structure is useless. It is the Potemkin Village of modern administration. The fact that generating bits of random data for the program structure takes valuable time away from more constructive concerns also harms policy analysis. The whole point of policy analysis is to show that what had been done intuitively in the past may be done better through sustained application of intelligence. The adoption of meaningless program structures, and their perversion into slogans for supporting existing policies, does not—to say the least—advance the cause of policy analysis.

Gorham Testimony

I do not mean to suggest that the introduction of PPBS has not led to some accomplishments. Before we consider the significance of these accomplishments, however, it is essential that we understand what PPBS has manifestly *not* done. One could hardly have a better witness on this subject than William Gorham, formerly Assistant Secretary

¹³ Similar difficulties under similar conditions evidently occur in the business world. It is worth citing Anthony's comments: "Strategic planning [that is, policy analysis] is essentially *irregular*. Problems, opportunities, and 'bright ideas' do not arise according to some set timetable; they have to be dealt with whenever they happen to be perceived. . . . Failure to appreciate the distinction between regular and irregular processes can result in trouble of the following type. A company with a well-developed budgeting process decides to formalize its strategic planning. It prepares a set of forms and accompanying procedures, and has the operating units submit their long-range plans on these forms on one certain date each year. The plans are then supposed to be reviewed and approved in a meeting similar to a budget review meeting. Such a procedure does not work. . . . There simply is not time enough in an annual review meeting for a careful consideration of a whole batch of strategic proposals. . . . It is important that next year's operating budget be examined and approved as an entity so as to ensure that the several pieces are consonant with one another. . . . Except for very general checklists of essential considerations, the strategic planning process follows no prescribed format or timetable. Each problem is sufficiently different from other problems so that each must be approached differently." *Planning and Control Systems, op. cit.*, pp. 38-39.

(Program Coordination), Department of Health, Education, and Welfare, and now head of the Urban Institute, who is widely acknowledged to be an outstanding practitioner of program budgeting.

At the highest level of generality, it is clear that PPBS does not help in making choices between vast national goals such as health and defense, nor is PPBS useful in making tradeoffs between more closely related areas of policy such as health, education, and welfare. In his testimony before the Joint Economic Committee, Gorham put the matter bluntly:

Let me hasten to point out that we have not attempted any grandiose cost-benefit analyses designed to reveal whether the total benefits from an additional million dollars spent on health programs would be higher or lower than that from an additional million spent on education or welfare. If I was ever naive enough to think this sort of analysis possible, I no longer am. The benefits of health, education, and welfare programs are diverse and often intangible. They affect different age groups and different regions of the population over different periods of time. No amount of analysis is going to tell us whether the Nation benefits more from sending a slum child to pre-school, providing medical care to an old man or enabling a disabled housewife to resume her normal activities. The "grand decisions"—how much health, how much education, how much welfare, and which groups in the population shall benefit—are questions of value judgments and politics. The analyst cannot make much contribution to their resolution.¹⁴

It turns out that it is extremely difficult to get consensus on goals within a single area of policy. As a result, the policy analysts attempt to find objectives that are more clearly operational and more widely acceptable. Gorham speaks with the voice of experience when he says:

Let me give you an example. Education. What we want our kids to be as a result of going to school is the level of objective which is the proper and the broadest one. But we want our children to be different sorts of people. We want them to be capable of different sorts of things. We have, in other words, a plurality of opinions about what we want our schools to turn out. So you drop down a level and you talk about objectives in terms of educational attainment—years of school completed and certain objective measures of quality. Here you move in education from sort of fuzzy objectives, but very important, about what it is that you want the schools to be doing, to the more concrete, less controversial, more easily to get agreed upon objectives having to do with such things as educational attainment, percentage of children going to college, etc.

I think the same thing is true in health and in social services, that at the very highest level objective, where in theory you would really like to say something, the difficulty of getting and finding a national consensus is so great that you drop down to something which is more easily and readily accepted as objectives.¹⁵

What can actually be done, according to Gorham, are analytic studies of narrowly defined areas of policy. "The less grand decisions," Gorham testified, "those among alternative programs with the same or similar objectives within health—can be substantially illuminated by good analysis. It is this type of analysis which we have undertaken at the Department of Health, Education, and Welfare."¹⁶ Gorham gives as examples disease control programs and improvements in the health of children. If this type of project analysis is what can be done under PPBS, a serious question is raised: Why go through all the rigamarole in order to accomplish a few discrete studies of important problems?

¹⁴ *Hearings, The Planning-Programming-Budgeting System: Progress and Potentials, op. cit.*, p. 5.

¹⁵ *Ibid.*, pp. 80-81. One might think that a way out of the dilemma could be had by adopting a number of goals for an area of policy. When Committee Chairman William Proxmire suggested that more goals should be specified, Gorham replied, "I would like to be the one to give the first goal. The first one in is always in the best shape. The more goals you have, essentially the less useful any one is, because the conflict among them becomes so sharp" (p. 83).

¹⁶ *Ibid.*, p. 8.

A five-year budget conceived in the hodgepodge terms of the program structure serves no purpose.¹⁷ Since actual budget decisions are made in terms of the old categories and policy analysis may take place outside of the program structure, there is no need to institutionalize empty labels. If a policy analysis has been completed, there is no reason why it cannot be submitted as part of the justification of estimates to the Bureau of the Budget and to Congress. For the few program memoranda that an agency might submit, changes could be detailed in terms of traditional budget categories. Problems of program structure would be turned over to the agency's policy analysts who would experiment with different ways of lending intellectual coherence to the agency's programs. There would be no need to foist the latest failure on a skeptical world. Nor would there be battles over the costs of altering a program structure that has achieved, if not a common framework, at least the virtue of familiarity. The difference is that stability of categories in the traditional budget has real value for control¹⁸ while the embodiment of contradictions in the program structure violates its essential purpose.

INCENTIVES FOR POLICY ANALYSIS

PPBS discredits policy analysis. To collect vast amounts of random data is hardly a serious analysis of public policy. The conclusion is obvious. The shotgun marriage between policy analysis and budgeting should be annulled. Attempts to describe the total agency program in program memoranda should be abandoned. It is hard enough to do a good job of policy analysis, as most agency people now realize, without having to meet arbitrary and fixed deadlines imposed by the budget process.¹⁹ There is no way of telling whether an analysis will be successful. There is, therefore, no point in insisting that half-baked analyses be submitted every year because of a misguided desire to cover the entire agency program. The Budget Bureau itself has recently recognized the difficulty by requiring agencies to present extensive memoranda only when major policy issues have been identified. It is easier and more honest just to take the program structure out of the budget.

The thrust of the argument thus far, however, forces us to confront a major difficulty. Policy analysis and budgeting were presumably connected in order to see that high quality analysis did not languish in limbo but was translated into action through the critical budget process. Removing policy analysis from the annual budget cycle might increase its intellectual content at the expense of its practical

¹⁷ Anthony again supplies a useful comparison from private firms that makes a similar point: "An increasing number of businesses make profit and balance sheet projections for several years ahead, a process which has come to be known by the name 'long-range planning.' . . . A five-year plan usually is a projection of the costs and revenues that are anticipated under policies and programs *already approved*, rather than a device for consideration of, and decision on, new policies and programs. The five-year plan reflects strategic decisions already taken; it is not the essence of the process of making new decisions. . . . In some companies, the so-called five-year plan is nothing more than a mechanical extrapolation of current data, with no reflection of management decisions and judgment; such an exercise is virtually worthless" (*Planning and Control System, op. cit.*, pp. 57-58).

¹⁸ An excellent discussion of different purposes of budgeting and stages of budgetary development is found in Allen Schick, "The Road to PPB: The Stages of Budget Reform," *PUBLIC ADMINISTRATION REVIEW*, Vol. XXVI, No. 4, December 1966, pp. 243-258.

¹⁹ In another paper ("Toward A Radical Incrementalism," Washington, D.C.: American Enterprise Institute for Public Policy Research, December 1965.) I have proposed that policy analysis would be facilitated by abolishing the annual budget cycle. One of the great weaknesses of governmental policy making is that policies are formulated a good two years before funds become available. Given the difficulties of devising policies in the first place, the time lag wreaks havoc with the best analysis. Since no one seems disposed to consider this alternative seriously, I mention it merely in passing as a change that would fit in with what has been suggested.

impact. While formal program structures should go—PPBS actually inhibits the prospects for obtaining good analysis that is worth translating into public policy—they should be replaced with a strong incentive to make policy analysis count in yearly budgetary decisions. I am therefore proposing a substitute for PPBS that maintains whatever incentive it provided for introducing the results of policy analysis into the real world without encouraging the debilitating effects.

The submission of program memoranda supported by policy analysis should be made a requirement for major dollar changes in an agency's budget. The Bureau of the Budget should insist that this requirement be met by every agency. Agency heads, therefore, would have to require it of subunits. The sequence could operate as follows:

1. Secretary of agency and top policy analysts review major issues and legislation and set up a study menu for several years. Additions and deletions are made periodically.

2. Policy analysts set up studies which take anywhere from six to 24 months.

3. As a study is completed for a major issue area, it is submitted to the Secretary of the agency for review and approval.

4. If approved, the implications of the study's recommendations are translated into budgetary terms for submission as a program memorandum in support of the agency's fiscal year budget.

No one imagines that a mechanical requirement would in and of itself compel serious consideration of policy matters. No procedure should be reified as if it had a life of its own apart from the people who must implement it. This conclusion is as true for my suggestion as for PPBS. We must therefore consider ways and means of increasing the demand for and supply of policy analysis.

Increasing Demand and Supply

The first requirement of effective policy analysis is that top management want it. No matter how trite this criterion sounds, it has often been violated, as Frederick C. Mosher's splendid study of program budgeting in foreign affairs reveals.²⁰ The inevitable difficulties of shaking loose information and breaking up old habits will prove to be insuperable obstacles without steady support from high agency officials. If they do not want it, the best thing to do is concentrate efforts in another agency. Placing the best people in a few agencies also makes it more likely that a critical mass of talent will be able to achieve a creative response to emerging policy problems.

Policy analysis should be geared to the direct requirements of top management. This means that analysis should be limited to a few major issues. Since there will only be a few studies every year, the Secretary should have time to consider and understand each one. The analytical staff should be flexible enough to work on his priority interests. Consequently, one of the arguments by which program budgeting has been oversold has to be abandoned. Policy analysis will not normally identify programs of low priority. Top management is not interested in them. They would receive no benefit from getting supporters of these programs angry at them. Instead, agency heads want to know how to deal with emergent problems. Practitioners of policy analysis understand these considerations quite well. Harry

²⁰ Frederick C. Mosher, "Program Budgeting in Foreign Affairs: Some Reflections," memorandum prepared at the request of the Subcommittee on National Security and International Operations of the Committee on Government Operations, U.S. Senate, 90th Congress, Second Session, 1968.

Shooshan, Deputy Undersecretary for Programs, Department of the Interior, presents a perceptive analysis:

. . . We have tried to more heavily relate our PPB work and our analytical work to the new program thrusts, and major issues, not because it is easier to talk about new programs, but rather, there is a good question of judgment, on how much time one should spend on ongoing programs that are pretty well set. So you restate its mission and you put it in PPB wrapping and what have you really accomplished?

There are going to be new program proposals, new thrusts of doing something in certain areas. Let's relate our analyses to that and get the alternatives documented as well as we can for the decision-makers. So it is a combination of on the one hand it being difficult to identify low priorities in a manner that really means something and on the other hand, it is the fact of what have we really accomplished by simply putting old programs in new wrappings when new programs really should get the emphasis right now in terms of what are the decisions now before, in my case, the Secretary of the Interior, in terms of what should he know before he makes decisions relative to where he is attempting to go. If I can relate PPB to the decisions on his desk today and the near future, I can sell him and in turn, our own Department on the contribution that we can make.²¹

The implications of Shooshan's point go beyond making policy analysis more desirable by having it meet the needs of top management. The subjects for policy analysis ought to be chosen precisely for their critical-fluid-emergent character. These are the places where society is hurting. These are the areas in which there are opportunities for marginal gains. Indeed, a major role for top management is scanning the political horizon for targets of opportunity. Yet the characteristics of these new problems run counter to the criteria for selection that PPBS currently enforces, since they are identified by ambiguity concerning goals, lack of data upon which to project accurate estimates of costs and consequences, and pervasive uncertainty concerning the range of possible changes in program.

There would be a much larger demand for policy analysis if it were supplied in ways that would meet the needs of high level officials. Let us consider the example of the President of the United States. He can certainly use policy analysis to help make better decisions. Substantial policy studies would give him and his staff leverage against the bureaucracy. Knowledge is power. Indeed, command of a particular field would enable Presidents to exert greater control over the agenda for public decision and would give them advantages in competition with all sorts of rivals. Presidents could use perhaps a dozen major policy studies per year of their most immediate concerns. If even a few of these turn out well, the President may be motivated to make use of them. Contrast this with the present inundation of the Executive Office by endless streams of program "books," summaries, and memoranda that nobody ever looks at.

What is true of the President is also true for important executives in the agencies. Policy-oriented executives will want to get better analysis. Executives wishing to increase their resource base will be interested in independent sources of information and advice. Those who would exert power need objectives to fight for. It is neither fashionable nor efficient to appear to seek power for its own sake. In polite society the drive is masked and given a noble face when it can be attached to grand policy concerns that bring benefits to others as well as to power seekers. The way to gain the attention of leaders is not to flood them with trivia but to provide examples of the best

²¹ *Hearings, The Planning-Programming-Budgeting System: Progress and Potentials, op. cit.*; pp. 77-78.

kind of work that can be done. The last years of the Johnson Administration witnessed a proliferation of secret commissions to recommend new policies. The department secretary often became just another special pleader. If they have any interest in curbing this development, secretaries may find that producing their own policy analyses allow them to say that outside intervention is not the only or the best way to generate new policies.

Congressional Demand

If strategically located Congressmen demanded more policy analysis, there is little doubt that we would get it. What can be done to make them want more of it? The answer does not lie in surrounding them with large staffs so that they lose their manifestly political functions and become more like bureaucrats. Nor does the answer lie in telling Congressmen to keep away from small administrative questions in favor of larger policy concerns. For many Congressmen get into the larger questions only by feeling their way through the smaller details.²² A threat to deprive Congressmen of the traditional line-item appropriations data through which they exert their control of agency affairs also does not appear to be a good way of making Congressmen desire policy analysis.

Policy analysis must be made relevant to what Congressmen want. Some legislators desire to sponsor new policies and they are one clientele for analysis. For other Congressmen, however, policy is a bargainable product that emerges from their interactions with their fellows. These members must be appealed to in a different way. They often have a sense of institutional loyalty and pride. They know that Congress is a rare institution in this world—a legislative body that actually has some control over public policy. They are aware that the development of new knowledge and new techniques may freeze them out of many of the more serious decisions. Policy analysis should be proposed to these men as an enhancement of the power of Congress as an institution. The purpose of analysis would be, in its simplest form, to enable Congressmen to ask good questions and to evaluate answers. Oftentimes it is hardest for a layman to recognize the significant questions implicit in an area of policy. Are there other and better questions to be asked, other and better policies to be pursued?

A Congress that takes seriously its policy role should be encouraged to contract for policy analysis that would stress different views of what the critical questions are in a particular area of policy. Each major committee or subcommittee should be encouraged to hire a man trained in policy analysis for a limited period, perhaps two years. His task would be to solicit policy studies, evaluate presentations made by government agencies, and keep Congressmen informed about what are considered the important questions. In the past, chairmen have not always paid attention to the quality of committee staffs. Following the lead of the Joint Economic Committee, seminars might be held for a couple of weeks before each session. At these seminars discussions would take place between agency personnel, committee staff, and the academics or other experts who have produced the latest policy analysis. If all went well, Congressmen would emerge with a better idea of the range of issues and of somewhat different ways of tackling the

²² "Toward A Radical Incrementalism," *op. cit.*, pp. 27-29.

problems, and the policy analysts would emerge with a better grasp of the priorities of these legislators.

Suppliers of Policy Analysis

Thus far we have dealt solely with the incentive structure of the consumers who ought to want policy analysis—agency heads, Presidents, Congressmen. Little has been said about the incentive structure of the suppliers who ought to provide it—analysts, consultants, academics. Our premise has been that the supply of policy analysis would be a function of the demand. Now, the relationships between supply and demand have long been troublesome in economics because it is so difficult to sort out the mutual interactions. Upon being asked whether demand created supply or supply created demand, the great economist Marshall was reported to have said that it was like asking which blade of the scissors cuts the paper. There is no doubt, however, that changes in the conditions and quality of supply would have important effects on the demand for policy analysis.

Disengaging policy analysis from PPBS would help build the supply of policy analysis by:

1. Decreasing the rewards for mindless quantification for its own sake. There would be no requests from the Bureau of the Budget for such information and no premium for supplying it.

2. Increasing the rewards for analysts who might try the risky business of tackling a major policy problem that was obviously not going to be considered because everyone was too busy playing with the program structure. Gresham's Law operates here: programmed work drives out unprogrammed activity, makework drives out analysis.

One way of increasing the supply of policy analysis would be to improve the training of people who work directly in the various areas of policy. Instead of taking people trained in policy analysis and having them learn about a particular policy area, the people in that area would be capable of doing policy analysis. Three-day or three-month courses will not do for that purpose. A year, and possibly two years, would be required. Since it is unlikely that the best people can be made available for so long a period, it is necessary to think in terms of education at an earlier period in their lives. There is a great need for schools of public policy in which technical training is combined with broader views of the social context of public policy. Although no one knows how to teach "creativity," it is possible to expose students to the range of subjects out of which a creative approach to public policy could come.

Another way of increasing the supply of policy analysis would be to locate it in an organizational context in which it has prestige and its practitioners are given time to do good work. Having the policy analysis unit report directly to the secretary or agency head would show that it is meant to be taken seriously.²³ But then it is bound to get involved in day-to-day concerns of the agency head, thus creating a classic dilemma.

²³ When Charles Hitch was Controller of the Defense Department, the policy analysis unit reported directly to him, as did the budget unit. One reported result is that the policy unit was able to do its work without being drawn into the daily concerns of the budget men. When policy analysis (called systems analysis) was given separate status, with its own assistant secretary, there was apparently a much greater tendency for its members to insist upon control of immediate budgetary decisions. Hence the distinction between longer-run policy analysis and shorter-run budgeting tended to be obscured. It would be interesting to know whether the participants saw it in this way. Optimal placement of a policy analysis unit is bound to be a source of difficulty and a subject of controversy.

Tactics

The effective use of a policy analysis unit cannot be specified in advance for all agencies. There are certain tensions in its functions that may be mitigated on a case-by-case basis but cannot be resolved once and for all. Serious policy analysis requires months, if not years, of effort. A unit that spends its time solely on substantial policy analysis would soon find itself isolated from the operational concerns of the agency. There would be inordinate temptations on the part of its members to go where the action is. Before long, the policy unit might become more immediately relevant at the expense of its long-term impact. The frantic nature of day-to-day emergencies drives out the necessary time and quiet for serious study and reflection. What can be done? One tactic is for the policy unit to consider itself an educational as well as an action group. Its task should be to encourage analysis on the part of other elements of the organization. It should undertake nothing it can get subunits to do. The role of the policy unit would then be one of advising subunits and evaluating their output.

A second tactic would be to contract out for studies that are expected to take the longest period of time. The third tactic is the most difficult, because it calls for a balancing act. Immediate usefulness to top management may be secured by working on problems with short lead times while attempting to retain perhaps half of the available time for genuine policy analysis. To the degree that serious policy analysis enters into the life of the organization and proves its worth, it will be easier to justify its requirements in terms of release from everyday concerns. Yet the demand for services of the analysts is certain to increase. Failures in policy analysis, on the other hand, are likely to give the personnel involved more time for reflection than they would prefer. Like headquarters-field relationships, line and staff responsibilities, and functional versus hierarchical command, the problems of the policy unit are inherent in its situation and can only be temporarily resolved.

These comments on incentives for increasing the supply and demand for policy analysis are plainly inadequate. They are meant merely to suggest that there is a problem and to indicate how one might go about resolving it. We do not really know how to make policy analysis fit in with the career requirements of Congressmen, nor can we contribute much beside proverbial wisdom to the structure and operation of policy analysis units. There are, however, opportunities for learning that have not yet been used. One of the benefits flowing from the experience with PPBS is that it has thrown up a small number of policy analyses that practitioners consider to be good. We need to know what makes some live in the world and others remain unused. Aside from an impressive manuscript by Clay Thomas Whitehead,²⁴ however, in which two recent policy analyses in defense are studied, there has been no effort to determine what this experience has to teach us. Despite the confident talk about policy analysis (here and elsewhere), a great deal of work remains to be done on what is considered "good" and why. The pioneering work by Charles E. Lindblom should not be wrongly interpreted as being anti-analysis, but as a seminal effort to understand what we do when we try to grapple with social problems.

²⁴ Clay Thomas Whitehead, "Uses and Abuses of Systems Analysis," The RAND Corporation, September 1967.

Reexamination

Critical aspects of policy analysis need to be reexamined. The field cries out for a study of "coordination" as profound and subtle as Martin Landau's forthcoming essay on "Redundancy."²⁵ That most elemental problem of political theory—the proper role of the government versus that of the individual—should be subject to a radical critique.²⁶ The fact that cost-benefit analysis began with water resource projects in which the contribution to national income was the key question has guided thought away from other areas of policy for which this criterion would be inappropriate. There are policies for which the willingness of citizens to support the activity should help determine the outcome. There are other policies in which presently unquantifiable benefits, like pleasure in seeing others better off or reduction of anxiety following a visible decrease in social hostility, should be controlling. Although social invention is incredibly difficult, the way is open for new concepts of the role of government to liberate our thoughts and guide our actions.

In many ways the times are propitious for policy analysis. The New Deal era of legislation has ended and has not yet been replaced by a stable structure of issues. People do not know where they stand today in the same way they knew how they felt about Medicare or private versus public electric power. The old welfare state policies have disenchanted former supporters as well as further enraged their opponents. Men have worked for 20 years to get massive education bills through Congress only to discover that the results have not lived up to their expectations; it takes a lot more to improve education for the deprived than anyone had thought. There is now a receptivity to new ideas that did not exist a decade ago. There is a willingness to consider new policies and try new ways. Whether or not there is sufficient creativity in us to devise better policies remains to be seen. If we are serious about improving public policy, we will go beyond the fashionable pretense of PPBS to show others what the best policy analysis can achieve.

²⁵ See Martin Landau, "Redundancy," *PUBLIC ADMINISTRATION REVIEW*, scheduled for publication in Volume XXIX, No. 4, July/August 1969.

²⁶ For a fine example of original thought on this question, see Paul Feldman, "Benefits and the Role of Government in a Market Economy," Institute For Defense Analyses, Research Paper, February 1968, p. 477.

PLANNING-PROGRAMMING-BUDGETING

DEFENSE ANALYSIS: TWO EXAMPLES

SUBMITTED BY THE

SUBCOMMITTEE ON NATIONAL SECURITY AND
INTERNATIONAL OPERATIONS

(Pursuant to S. Res. 24, 91st Cong.)

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INTRODUCTORY NOTE

Following on the subcommittee's earlier inquiry into the planning-programming-budgeting system, we are continuing to monitor the application of program budgeting and analysis in national security affairs. We intend to bring to the attention of the Congress from time to time pertinent new materials.

Analysis, of course, varies greatly in quality. One often wishes that advisers with different points of view would confront each other directly and in public so that hidden or unstated assumptions could be revealed and the different modes of analysis explored.

Such a direct confrontation did take place at recent hearings of the Senate Armed Services Committee during debate on ballistic missile defense. On one side, Professor George Rathjens of M.I.T. and, on the other side, Professor Albert Wohlstetter of the University of Chicago appeared before the committee in open session and addressed many of the same points. Their testimony provides an unusual chance to deepen one's understanding of what defense analysis is like.

The purpose of this publication is to make these analyses and the subsequent exchange of letters in *The New York Times* readily available in convenient form.

HENRY M. JACKSON,
*Chairman, Subcommittee on National Security
and International Operations.*

SEPTEMBER 10, 1969.

A basic issue in the ABM debate was the extent of the vulnerability of the American land-based Minuteman ICBM's to Soviet SS-9 attack in the period of the mid-1970's. Proponents of ABM argued that by the mid-1970's, unless we continue to make appropriate decisions to meet technological change, the ability of a very large part of our Minuteman force to strike back would be put in question. The opponents of ABM argued that the Soviet Union would be able to destroy only a smaller proportion of our Minutemen and that a sufficient number would be left to strike back and inflict unacceptable damage.

The accuracy of calculations on the SS-9 threat to Minuteman became of central importance in Senate consideration of the ABM.

The conflicting analyses of Dr. George W. Rathjens, Visiting Professor of Political Science, M.I.T., and Dr. Albert Wohlstetter, University Professor, University of Chicago, dealt with this and certain related points.

STATEMENT OF DR. GEORGE W. RATHJENS TO THE SENATE
COMMITTEE ON ARMED SERVICES, APRIL 23, 1969*

(Excerpt)

I welcome the opportunity, and am honored, to appear before you to comment on the question of our deployment of an anti-ballistic missile defense system. . . .

In considering defense of our strategic retaliatory forces two questions must be asked:

1. Are they likely to be so vulnerable to preemptive attack in the near future that a decision must be made now to remedy that vulnerability?

2. If so, is the deployment of the proposed SAFEGUARD ABM defense for MINUTEMAN the preferred way of dealing with the problem?

The Administration's decision implies an affirmative answer to both questions. In my judgment the answer is almost certainly negative.

Our strategic forces now have the capability to deliver over four thousand nuclear warheads against an adversary. Less than one tenth of that force could, according to former Secretary of Defense McNamara, destroy over 75% of the industry and 30% of the population of the Soviet Union, the latter figure being almost certainly a low estimate since it is based on immediate and easily calculable fatalities with those that are delayed and difficult to quantify being neglected. During the time when SAFEGUARD is being deployed the number of warheads our strategic force can deliver will be increased to ten thousand or so assuming implementation of present plans to replace large fractions of our MINUTEMAN and POLARIS force with new missiles carrying several warheads each.

While these new warheads will each be of lower yield than those they replace, they will nevertheless be very much more powerful than those that destroyed Hiroshima and Nagasaki. The net effect of these changes is that our capability for inflicting damage on an adversary will go up sharply during the next few years. Even without adding to this the fact that we also have several thousand nuclear warheads in Europe, some of which could be delivered by tactical forces against the USSR, a preemptive strike against us in the mid-70's would seem like madness on the part of the Soviet leadership unless they could have extremely high confidence of being able to destroy at least 95%, and more likely 98%, of our retaliatory force.

This implies an ability to destroy nearly simultaneously our ICBM and our POLARIS forces, a requirement that could be met only if the Soviet Union were to develop very large numbers of highly accurate missiles and an extremely effective anti-submarine warfare capability. In this connection it is to be noted that we are probably ahead

*From hearings, "Authorization for Military Procurement, Research and Development, Fiscal Year 1970, and Reserve Strength," Senate Committee on Armed Services, 91st Congress, 1st session, part 2.

of the USSR in all of the relevant technologies: the development of MIRV's, the attainment of very high accuracies with our missiles, and in ASW developments. Yet even if the Soviet SS-9 missile force were to grow as rapidly as the Defense Department's most worrisome projections, even if the Soviet Union were to develop and employ MIRV's with those missiles and even if they achieved accuracies as good as we apparently expect with our MIRV forces (according to figures released in late 1967 by former Deputy Secretary of Defense Nitze), a quarter of our MINUTEMAN force could be expected to survive a Soviet preemptive SS-9 attack. That quarter would alone be more than enough to inflict unacceptable damage on the USSR. The possibility of the Soviet Union attaining an ASW capability that would imperil our POLARIS force is even more remote. Despite our superiority in ASW there is no reason to believe that even we will have really effective ASW capabilities during the next few years. (If there were any real basis for hope we would presumably be expanding our forces when in fact the Nixon Administration budget involves a cut of \$105 million for attack submarines.)

In addition to means of destroying our ICBM's and SLBM's, the Soviet Union would also have to have a highly effective air defense including capability to cope with improved air-to-surface missiles if it were to rationally consider a preemptive attack against us. This follows because of the impossibility of coordinating a preemptive strike against all our retaliatory forces, and because of the possibility that some of our aircraft may be airborne at the time of attack. If an adversary were to time an attack so that our ICBM's and bomber bases would be struck at the same time, early warning of the attack against our ICBM's would permit us to launch at least 40 percent of the bomber fleet. If an attempt were made to strike the bomber bases by surprise using FOB's or SLBM's, then we would have at least 20 minutes after destruction of the bombers during which to launch our ICBM's. Thus, a coordinated attack that would knock out ICBM's, SLBM's, and bombers would appear to be impossible.

From the Soviet point of view an effective first strike is an even more difficult undertaking than the above implies. While we have designed our ICBM force so that it can "ride out" an attack against it, Soviet decision makers could never be sure that the force would not be launched before their weapons actually detonated.

Thus, the determination that action is now needed to cope with a potential mid-70 threat to our retaliatory capability seems decidedly premature. I know of no basis for believing that the concatenation of events required to place our retaliatory forces in peril by the mid-70's is even a remote possibility.

But, however tenuous the basis for the argument, the Administration has clearly decided that our retaliatory capability may be threatened in the mid-70's, and that action is now required to insure that it will not be. If indeed such an essential element of American strength as our retaliatory posture may be in jeopardy, I would suggest that defense of MINUTEMAN using SAFEGUARD is hardly a high confidence solution.

There is, as I am sure you are aware, substantial doubt in the scientific community about whether such a complex system as SAFEGUARD can be counted on to function reliably, particularly consider-

ing that it will never be possible to test it in an environment that even remotely simulates that in which it will have to operate. Experience with far less complex systems reinforces those doubts. Recollection of our experience with our ICBM programs should certainly give us pause.

Despite the fact that the requirements for reliable performance in the case of a defense of ICBM's may not be as high as for defense of cities, it seems to me that the Administration is asking great forbearance on the part of the American public when it attempts to persuade them that our retaliatory capability is in jeopardy, and then offers as a solution to the problem a system in which they can have no more confidence than in SAFEGUARD.

However, even if SAFEGUARD could be counted on with high confidence to perform exactly in conformance with specifications, there would still be reason to doubt that it would be a good solution to the question of possible MINUTEMAN vulnerability. . . .

Appendix: Defending MINUTEMAN Missiles With the SAFEGUARD System

I

The Administration has stated that the total cost of Phase I of its SAFEGUARD plan will be 2.1 billion dollars. Two ICBM sites at Great Falls, Montana, and Grand Forks, North Dakota, will be defended.

It is unlikely that either will have more than 75 SPRINT missiles considering that the Administration has announced that the number of SPRINTS would not be increased significantly over the earlier plan, and that all twelve SAFEGUARD sites are now to have SPRINT defenses.

If one assumes accuracy for Soviet SS-9 missiles comparable to that expected for U.S. MIRV programs, an optimum Soviet attack would employ MIRV warheads in the yield range near one megaton and each Soviet SS-9 missile could carry several of these. Several such warheads would have to be targeted on each MINUTEMAN to have a reasonable chance of destroying it, but one such warhead could easily destroy the missile site radar.

The defense would have to assume that the radar would be targeted in any attack, and it would have to be defended. If the defense assumes its interceptors will work perfectly it might allocate only one to each Soviet reentry vehicle that might destroy the radar. More reasonably the defense might allocate at least two SPRINTS to attempt intercept of each incoming reentry vehicle. To exhaust the defenses in these circumstances the Russians would have to allocate at most 200 reentry vehicles to attack the two MSR's. If they did so they would be able to destroy some 40 fewer MINUTEMAN than if there had been no defense.

Thus, the defense will have saved that number of MINUTEMAN for a cost of \$2.1 billion, or at a cost of 50 million per MINUTEMAN saved.

There are many reasons why this estimate is likely to be much too low.

1) If some of the SPRINTS are deployed too far away from the MSR to defend it, or if there are fewer than 75 SPRINTS per base, the

costs per MINUTEMAN saved could go up sharply—perhaps several-fold.

2) If the offense could count on at least two SPRINTS being allocated to attack each reentry vehicle targeted against the radar, and it probably could, it would have to allocate only half as many reentry vehicles to radar attack to exhaust the defenses, the effect being to double the cost per MINUTEMAN saved.

3) If the adversary warheads did not have a kill probability of one against the MINUTEMAN (or the radar), the number of MINUTEMAN saved will be decreased assuming, as is likely, that at least some warheads that would have gone wide of their marks would nevertheless have been intercepted.

4) If, after review, the Administration should decide to terminate the program after completing only the Montana and North Dakota bases, then all of the development and production tooling costs would have to be written off against just the two sites.

5) While we might hope that the Administration's \$2.1 billion cost estimate is correct, costs of similar programs have generally escalated upon implementation. (Note also that the \$2.1 billion figure does not include AEC costs for SAFEGUARD.)

Considering these reasons, the 50 million dollar figure above should be multiplied—perhaps by a factor of three to ten. Obviously then, an estimate of 50 to 100 million dollars per MINUTEMAN saved is very conservative.

Two arguments can be made against the foregoing line of reasoning:

1) It can be said that the discussion neglects the effects of SPARTAN missiles in degrading an adversary attack. On technical grounds this seems like a reasonable approximation. While the offense would of course have to allocate some effort to insuring penetration of SPARTAN defenses, it would hardly be enough to change significantly the above estimates. In any case, the Administration can scarcely argue otherwise since, in claiming as it has that the Soviet Union need not react to a nationwide SPARTAN defense by improving its offensive forces, it has implicitly acknowledged SPARTAN's inutility as a defense against a sophisticated attack.

2) It can be argued that the discussion fails to consider the bonus effect implicit in the fact that the sites at Grand Forks and Malstrom would offer protection of population against Chinese attack. It is probably reasonable to neglect this considering that the relatively small cities in this area, particularly in the area protected by the Malstrom site, would be unlikely to be hit by the Chinese. This would be particularly so if only the Phase I program were implemented in view of the fact that they could as easily attack other far more populous targets which would not be defended at all.

II

For the Soviet Union to have a capability to destroy 90% of the MINUTEMAN force in a preemptive attack using a MIRVed SS-9 force, about 850 missiles would be required (assuming accuracies similar to those we expect and reliabilities of about 75%). For the capability to be achieved by January 1975 requires production at the rate of about one missile every three days. Assuming 4 or 5 MIRV's per missile, from about 20 to 50 missiles would be needed to exhaust 150

SPRINT interceptors, the number depending on the reliability of the offensive missile and the number of SPRINTS to be used against each attacking reentry vehicle. With a production rate of one ICBM every three days, from two to five months' production would suffice to neutralize the SAFEGUARD Phase I deployments. If the offense chose to use somewhat smaller yield reentry vehicles for radar attack than would be optimal for ICBM attack the production time would be further reduced.

STATEMENT OF DR. ALBERT WOHLSTETTER TO THE SENATE
COMMITTEE ON ARMED SERVICES, APRIL 23, 1969*

(Excerpt)

I appreciate the honor of testifying before this Committee on the role of an anti-ballistic missile system in the 1970's. . . .

Understanding of the complex problems of designing a protected and responsible nuclear strategic force has grown slowly among scientists as well as laymen, civilians as well as soldiers, Democrats as well as Republicans. But it has grown, and I think decisively. The United States has designed and deployed a second strike force capable of riding out an attack; and there have been large improvements in protecting responsible command.

This was accomplished not by merely expanding nuclear bombardment forces, but in essence by shifting to forces with protection against the changing threat. The stereotype repeated throughout the 1960's that our security has declined while our strategic force grew at an accelerating rate is grossly wrong on both counts.

In the past some key programs increased the protected second strike capacity of the force, while cutting at the same time billions of dollars from the spending projected, and our security is much greater in the 1960's, since we have protected and made more responsive our strategic force.

In the 1970's, unless we continue to make appropriate decisions to meet technological change, once again the viability of a large part of our second strike force will be put in question. Several related innovations, but in particular the development of a rocket booster carrying many reentry vehicles each aimed precisely at a different target (MIRV's), raise once again the possibility of attack ratios favoring the attacker. One reentry vehicle may kill a booster carrying several. One booster can carry the means of destroying many boosters.

Raising a question about the future second strike capacity of any part of our strategic force implies nothing about the present intentions of an adversary to strike first or even to be able in the future effectively to strike first. The recent debate on whether the SS-9 is a "first strike weapon" or whether the Russians intend it to be seems beside the point. If by maintaining our second strike capability we can make the risks of striking very great, this can affect an adversary's intentions favorably to ourselves.

*From hearings, "Authorization for Military Procurement, Research and Development, Fiscal Year 1970, and Reserve Strength," Senate Committee on Armed Services, 91st Congress, 1st session, part 2.

It can deter him even in a crisis, like the one over missiles in Cuba, when the alternative to striking may look bad, but not, if we are careful, as bad as striking. Moreover, we ought not to talk of "first strike weapons" and "second strike weapons" as if this could be settled simply by looking at the weapons on one side.

Whether or not a weapons system can preclude substantial retaliation will depend on many uncertain future performance characteristics of the forces on both sides. The test of whether one has a responsible second strike capability is whether one can, under nuclear attack, preserve vehicles, decision centers and the flow of communications among them, whether one can transmit the order to retaliate and penetrate adversary defenses to reach targets.

If we were unwilling even to entertain the hypothesis of a first strike, we would do nothing to protect any part of our strategic forces or its control centers by making them mobile or hard or by ABM. Some leading scientists who oppose currently deploying ABM say they will favor it for the defense of MINUTEMAN when precise MIRV's and the related offense technologies are likely to be available to the Russians. That calendar date, and not present Soviet intent, is then a major substantive issue for these opponents. And their position recognizes that we want to maintain the second strike capacity—not of just one, but of all major vehicles types in our strategic force: MINUTEMAN, bombers, and POSEIDON.

In designing a second strike force, there are excellent reasons for making it a substantial mixture of vehicles of several quite different types: land as well as sea based, manned as well as unmanned, each with its own mode of protection. Such systems have differing limitations, are subject to varied and independent uncertainties, require distinct modes of attack and, if each type is protected, greatly complicate the attack. It is a serious matter, then, if a large part of this mixture is badly affected by changing adversary forces and technologies. The forces deployed and the state of the art available to the Russians will influence other parts of our strategic force than MINUTEMAN silos. And ABM has a role to play, for example, in protecting the important fixed elements of a mobile force, including the politically responsible command centers. Preserving command, control and communications is always hard, and particularly so for mobile sea-based systems.

My remarks, however, center, so far as the second strike function of ABM is concerned, on the problem of protecting MINUTEMAN. We have good cause to preserve the second strike capability of so large a proportion of our strategic force. Even if it were true that the United States needed only a few strategic vehicles surviving, buying and paying for the operation of a great many that had become vulnerable to attack would be a very poor way to obtain those few surviving. There are safer and cheaper ways of getting a force of a given size than to buy a much larger one, most of which is susceptible to annihilation.

How does the planned timing of our ABM deployment compare to the date when it is reasonably likely that Russian offense technology could badly worsen the effectiveness of our projected MINUTEMAN III? The first point to note is that the proposed SAFEGUARD deployment has very extended leadtimes. It can stretch out further if continuing review of intelligence suggests it may, but the shortest

schedule calls for completing this program early in 1976. If, as ABM opponents stress in other connections, there is likely to be a substantial shakedown period, we are talking of 1977 or later. If, as has been suggested, we delay decision for another year or more and then proceed to design and develop an entirely new ABM, we are talking of the 1980's.

Second, predicting exact calendar dates at which technologies will be available to adversaries and what their strategic significance will be is very hard, and we are not very good at it. Moreover, we have erred not only on the side of overestimating Russian capabilities, but often by underestimating them. At earlier dates we were surprised by the rapid Soviet achievement of the A-bomb, the H-bomb, advanced jet engines, long-range turbo-prop bombers, airborne intercept radars, and large-scale fissile-material production. And scientists have been surprised; not only military men.¹

Third, the public discussion has not stressed how sensitively the accuracy of attack affects the viability of the hardened force attacked. Accuracy affects the number of weapons required to destroy a hard target very much more than the bomb yield or the overpressure resistance of the target. Roughly speaking, for such targets, improving accuracy by a factor of slightly more than two is the same as increasing bomb yield tenfold and serves essentially to offset a tenfold increase in overpressure resistance.

I have tried with some effort to reconstruct various numerical proofs recently presented or distributed to the Congress that purport to show our MINUTEMAN will be quite safe without any extra protection; these proofs depend heavily on optimistic estimates of limitations in Russian delivery accuracies, reliabilities, and associated offense capabilities and sometimes on very poor offense tactics. Suppose, however, that by 1976 when SAFEGUARD is deployed, or by 1977 when it may be shaken down, the Russians have:

- (1) Accuracies like those of the systems we are deploying now.
- (2) Overall reliabilities currently attributable to them.
- (3) Methods familiar to us for using extensive and timely information as to which missiles have failed so that others can replace them, the technique known as shoot-look-shoot.
- (4) Continued production of SS-9 boosters at past rates.
- (5) Modest numbers of MIRV's per booster (e.g., the three five-megaton reentry vehicles stated by Secretary Laird for the SS-9).

Then the percentage of the MINUTEMAN force that would be destroyed, if undefended, comes to about 95 percent.

These results are based on quite moderate assumptions about Russian capabilities. Better accuracies, for example, may be expected in the late 1970's, and higher degrees of MIRVing. Reliabilities of

¹ We have not been very good at predicting our own or our adversary's technologies. These matters are intrinsically uncertain. Eminent scientists at the end of the 1940's predicted that fusion weapons would be infeasible, and if feasible undeliverable, and if delivered of no strategic significance, since they thought (erroneously) they could be used only against cities. (Some of those who then thought the threat of fusion bombs against cities neither moral nor important strategically now take it to be both.) In February 1953 an important scientific study group expected the Soviets would have no ICBM's before the late 1960's—a prediction plainly in error by the end of the year. Writing in October 1964 some scientists opposing ABM were quite sure that no technological surprises could substantially change the operational effectiveness of intercontinental delivery systems, and thus entirely missed the major strategic potential of precisely aimed MIRV's, a concept that was at that very time emerging in the classified literature. These were able and informed men. But exact prediction on these matters defies confident assertion.

any given offense missile system improve with use. Do those who favor a hardpoint defense but would postpone a start really consider these Russian capabilities I have outlined "extremely implausible"? Or at all implausible?

There is a striking inconsistency in the way ABM opponents treat the Chinese and the Russians. In contemplating the possibility of a Russian offense against our MINUTEMAN, they assume Russians who cannot by 1976 or 1977—20 years after Sputnik—do what we know how to do now. When considering the ability of the Chinese to penetrate an ABM defense, they attribute to them penetration systems that cost us many billions of dollars, a dozen years of trials and many failures to develop—and they assume this frequently for first-generation Chinese missiles.

These are rather backward Russians and very advanced Chinese. Moreover, since in the Russian case we are considering a potential threat to our second-strike capability and we want this to be highly reliable, we want particularly to avoid underestimating the threat. But we should undertake a modest defense of population if it works in the expected case, even if on extremely pessimistic assumptions it might not. Here again it seems to me the ABM critics get things exactly backwards. . . .

The major components of the SAFEGUARD system have received elaborate study and testing. Ideas for brand new ABM systems to defend hard points that I am familiar with are not serious competitors in this time period. We should start deploying the system now on the schedule suggested and we should expect, as in the case of every other offense and defense system, that we shall learn a great deal from operational experience, make some changes and retrofits. This seems to me a sound way to supplement the protection of the MINUTEMAN in a period when we can expect it to be endangered. . . .

**SUPPLEMENTARY STATEMENT BY DR. ALBERT WOHLSTETTER
MAY 23, 1969***

MAY 23, 1969.

HON. JOHN STENNIS,
*Senate Armed Services Committee,
U.S. Senate, Washington, D.C.*

DEAR SENATOR STENNIS: I was very honored to appear before your Committee on April 23, and I appreciate the invitation you extended to me and other witnesses to submit supplementary statements. I am transmitting with this letter both an unclassified supplemental and a classified one relating the former to intelligence estimates and certain other classified matters.

Sincerely yours,

ALBERT WOHLSTETTER,
Professor, University of Chicago.

*Printed in hearings, "Authorization for Military Procurement, Research and Development, Fiscal Year 1970, and Reserve Strength," Senate Committee on Armed Services, 91st Congress, 1st session, part 2.

SUPPLEMENT ON PURPORTED PROOFS THAT THE MINUTEMAN WILL BE SAFE WITHOUT FURTHER PROTECTION

In preparing my testimony for the Senate Armed Services Committee on the role of ABM in the 1970s, I undertook to review and test my past views on the subject and once again to form my own independent judgment. I therefore did not rely on calculations of either the government or its critics. I took the relevant classified and public data and performed my own analysis.

The kind of analysis involved in obtaining a protected and responsible strategic force has been my principal concern for eighteen years starting with the study that gave rise to the first-strike/second-strike distinction and to a good many other concepts and modes of protecting and controlling strategic forces cited by both sides in the present debate. The ABM has other functions that I support, but my testimony in the space available focussed on its role in defending Minuteman. As I stressed there, these are complex and intrinsically uncertain matters. Where scientists differ on them, laymen may be tempted simply to throw up their hands and choose to rely on the authority of those scientists they favor. I feel, however, that the substantive differences among the scientists, if carefully explained, are quite accessible to the members of this Committee and that such careful explanation can help them form their own judgment as to which conclusions are sound.

ON THE SAFETY OF MINUTEMAN

In my statement to the Senate Armed Services Committee on April 23, I said, "I have tried to reconstruct various numerical proofs recently presented or distributed to the Congress that purport to show our Minuteman will be safe without any extra protection; these proofs depend heavily on optimistic estimates of limitations in Russian delivery accuracies, reliabilities, associated offense capabilities, and sometimes on poor offense tactics." In response to questions from members of the Committee, I illustrated several troubles with these attempted proofs of the safety of Minuteman, but there was no time to explain their defects adequately. I would like to try to do that now, and to comment specifically on the calculations of Dr. Rathjens, Dr. Lapp, and of the Federation of American Scientists. Some of the comments, particularly those of Dr. Lapp, bear also on some unevicenced statements on this subject by Prof. Chayes and Dr. Panofsky, and more recently, by Dr. Wiesner and Dr. Steven Weinberg.

Though my own calculations were based on classified as well as public data, my summary of results, like that of Dr. Rathjens, was unclassified and so are the comments I am about to make. This will prevent explicit specification of some of the numbers assumed by Dr. Rathjens and by myself and inevitably it forces some roundaboutness of expression. I am able to state, for example, that Dr. Rathjens and I assume the same accuracy for the Russian SS-9 in the mid- and late 1970's. I can say that the SS-9 is now expected (and, before the Nixon administration, was expected) to achieve that accuracy years in advance of this late time period. And I can say, as Dr. Rathjens did, that the accuracy we have assumed for the Russians, in this late time period, is essentially the same as that estimated for our own MIRV carrying missiles,

namely Poseidon and Minuteman III.¹ But I cannot say what that accuracy is.

I am, therefore, submitting a classified statement in which the essential numerical assumptions are explicit and related to intelligence estimates. However, even without the classified statement, some essential defects of the calculations of Dr. Rathjens, Dr. Lapp, and the Federation of American Scientists can be made clear.

Dr. Rathjens' calculations

Dr. Rathjens has stated "Even if the Soviet SS-9 missile force were to grow as rapidly as the Defense Department's most worrisome projections, even if the Soviet Union were to develop and employ MIRVs with those missiles and even if they achieved accuracies as good as we apparently expect with our MIRV forces (according to figures released in late 1967 by former Deputy Secretary of Defense Nitze), a quarter of our Minuteman force could be expected to survive a Soviet preemptive SS-9 attack. That quarter alone would be more than enough to inflict unacceptable damage on the USSR."²

My own parallel calculations for the mid- and late 1970s, using what I described as moderate assumptions, show about 5% surviving. What explains the difference? Since Dr. Rathjens and I compared notes on April 22, I am able to fix quite precisely where we agreed and where we differed.

Our assumptions agreed in the accuracy assumed for the SS-9, in the overall reliability rate, in the number of SS-9 boosters (500) and in the use of several independently aimed reentry vehicles in each booster. Our assumptions differed on three key points: in the degree of blast resistance assumed for our Minuteman silos, in the yield of the Russian reentry vehicles, and in the use or non-use by the Russians of substantial information about what missiles are unready at launch or fail in early stages.

On the first point, I have explained that Dr. Rathjens assumed that Minuteman silos were two-thirds more blast resistant than I did, and two-thirds more blast resistant than they are officially estimated to be. He derived his assumption by reading several points off an unclassified chart showing the probability of a Minuteman silo being destroyed as a function of accuracy for various bomb yields. Then by using standard rules for weapons effects he inferred the overpressure resistance of Minuteman silos. However, the curves on the unclassified chart cannot be correctly read to imply the overpressure resistance Dr. Rathjens infers. His reading of the curves was in error.

Second, I assumed three 5-megaton reentry vehicles for each SS-9, as in Secretary Laird's public statements. Dr. Rathjens assumed four 1-megaton reentry vehicles. More than four reentry vehicles can be fitted on the SS-9, if the payload is only one megaton. However, the three 5-megaton reentry vehicles, given the accuracy we both assume, and given the actual blast resistance of the Minuteman, do enough for the attacker. Using his lower Russian bomb yield and his overestimated Minuteman blast resistance, Dr. Rathjens derived a probability

¹ Poseidon and Minuteman III have been test flown and are in the process of deployment. (The first of these should be operational in about a year and a half.)

² Testimony of April 23 before the Senate Armed Services Committee. See also his testimony of March 28, Part 1, p. 359 of *Strategic and Foreign Policy Implications of ABM Systems*. Hearing before a subcommittee of the Senate Committee on Foreign Relations.

of about 60 percent that one arriving Russian reentry vehicle would destroy one Minuteman silo. If he had used the officially estimated 5-megaton reentry vehicle and the actual blast resistance of the Minuteman silo, the probability would have been nearly 99%. If he had used three 5-megaton reentry vehicles per booster for the SS-9 and the correct estimate for blast resistance, he would have found only 16%, instead of 25% of the Minuteman force surviving. Alternatively, if he had used the classified estimates of the number of 1-megaton reentry vehicles that can be fitted on an SS-9 booster, his calculations would have shown about 7.3 percent surviving. The combined significance of these first two points of difference between Dr. Rathjens and myself is then considerable.

The third point of difference between our calculations is that Dr. Rathjens assumes that the Russians would have to salvo all of their missiles with no information as to which had been unready or failed in time to be discovered, or at any rate with no use of such information. However, it is familiar that better methods are available and are of considerable utility for an offense that wants to assure a very high percentage of destruction of the force attacked. Most missiles that are counted as "unreliable" (excluded from the figure of overall reliability) are either not ready for launch or fail at launch, and this information can be made available immediately. A substantial additional fraction that fail do so at burnout, and information as to whether burnout velocity is within expected tolerances can also be made quickly available. For radio-guided missiles this is almost automatic, but inertial systems can also radio this information back, as the telemetering in missile flight test program shows. Later flight information is also feasible. While some fraction of the failures will remain unknown, a large proportion can be known. Therefore, instead of salvoing all extra missiles blindly, to make up for all unreadiness and all failures without knowing where they occur, one can reprogram some extra missiles to replace the large proportion of known failures. Using a current planning factor for the proportion of the unreliable missiles that cannot be replaced on the basis of timely information, the calculations using three 5-megaton reentry vehicles show considerably greater destruction. Instead of 16 percent surviving, the approximate 5 percent survival that I mentioned in my statement results. Such techniques of using substantial timely information as to which missiles cannot be relied on are less important for cases where smaller yields and larger numbers of reentry vehicles per booster are used. For the 1-megaton multiple reentry vehicle case I have referred to, the expected number of Minuteman surviving reduces from approximately 7.3 percent without using such techniques to 5 percent using them.

A table follows summarizing differences between Dr. Rathjens and my calculations:

CALCULATIONS ON THE VULNERABILITY OF THE MINUTEMAN FORCE IN THE LATE 1970s IF NO EXTRA PROTECTION

Difference Between Assumptions Used by Dr. Rathjens and Myself

	Assumption	Difference
Number of SS-9s.....	Same (500).....	
Overall reliability.....	Same.....	
Accuracy.....	Same.....	
Minuteman blast resistance.....	{ Dr. Rathjens'.....	2½ higher than official estimate. Official estimate. 4 reentry vehicles at 1 MT (less than SS-9 capability).
	{ Mine.....	
SS-9 payload.....	{ Dr. Rathjens'.....	3 at 5 MT (SS-9 capability). Not used.
	{ Mine.....	
Use of partial information on missile mal- functions.....	{ Dr. Rathjens'.....	Used.
	{ Mine.....	

Effect of assumptions on Minuteman survivability

	Percent of Minuteman surviving
Dr. Rathjens' result.....	25
Adjust for correct Minuteman blast resistance and three 5 MT MIRV per SS-9.....	16
Alternative adjust for correct Minuteman blast resistance and number of 1 MT MIRV warheads the SS-9 is capable of carrying.....	7.3
Using correct Minuteman blast resistance, either three 5 MT MIRV per SS-9, or the correct number of 1 MT warheads per SS-9, and informa- tion as to missile malfunctions.....	5

Dr. Lapp's calculations

Dr. Ralph Lapp's calculations were not presented at a Senate hearing. However, one set of his calculations was presented as a two-page appendix to his statement called "The Case Against Missile Defense," and they were featured in front page stories early in April in leading newspapers, describing Dr. Lapp as science advisor to the Senate opposition. These calculations attacking the credibility of a threat to Minuteman themselves apparently achieved widespread credence. They contain several grave errors, some of which have been pointed out independently by myself on April 23rd before the Senate Armed Services Committee, by Dr. Lawrence O'Neill before the House Armed Services Committee, and by Professor Eugene Wigner before the American Physical Society on April 29th. Yet these statements pointing out Dr. Lapp's errors have received little or no newspaper notice. It is therefore worth reviewing Dr. Lapp's calculations, particularly so since one of his most blatant errors appears to have been adopted uncritically by some of the other witnesses before the Committee, specifically Professor Chayes and Dr. Panofsky.³

Dr. Lapp states that his calculations are based on "maximum values" for Soviet capabilities. He shows 76% of the Minuteman surviving, compared to Dr. Rathjens' 25% and my 5%. Moreover, he has several assumptions that agree with my own:

- (1) Three 5-megaton reentry vehicles per SS-9; and
- (2) An accuracy estimate derived, like Dr. Rathjens', from public indications of the great precision of our Poseidon or Minuteman MIRV's.

His combined assumptions about the yield and accuracy of an SS-9 reentry vehicle and the blast resistance of the Minuteman result in

³ It is an error that is repeated also in *ABM—An Evaluation of the Decision To Deploy an Antibalistic Missile System*, edited by Abram Chayes and Jerome B. Wiesner, April 1969.

very high probabilities that a single arriving reentry vehicle will destroy a Minuteman silo.

He suggests that $2\frac{1}{2}$ warheads of 5-megaton power with a half nautical mile inaccuracy or CEP⁴ are needed to destroy a 200 psi target with a 95% probability, and 1.1 warheads would have that probability if the CEP were a quarter of a nautical mile. In fact, using standard methods of calculation, at a half mile inaccuracy, two warheads would yield a 96% destruction probability and at a quarter of a mile inaccuracy one warhead would have a more than 99% probability of destroying a 200 psi target. Either Dr. Lapp's calculations are based on some rather exotic and unspecified method, or they are in error. But in any case it is apparent that, even using his methods, he derives a very high single shot kill probability, roughly comparable to my own.

How then does Dr. Lapp's Minuteman force, faced by supposedly "maximum" Russian capabilities come out so much better than even Dr. Rathjens' Minuteman force? First, Dr. Lapp assumes a much smaller number of SS-9s than Dr. Rathjens and I. He assumes 333 SS-9s. This is hardly a maximum force. It is less than the number that would be produced at past rates by continuing production into the relevant 1976-77 time period. At three reentry vehicles per booster, Dr. Lapp's assumption would give the Russians about 1000 reentry vehicles.

Second, he assumes that the Russians would use only $\frac{3}{4}$ of their SS-9 force, that is, about 250 SS-9s (or 750 reentry vehicles). This extraordinary failure to use a fourth of the force most adapted to the purpose of destroying Minuteman is attributed to a supposed universal rule that military strategists always keep forces in reserve. This may or may not be true for tank battles or aircraft attacks in a conventional war. (The June 1967 war in the Middle East suggests it is not a sound generalization even about attacks with aircraft at the start of a non-nuclear war.) But for a nuclear first-strike? Dr. Lapp does not say for what these SS-9s would be reserved. Moreover, Dr. Lapp forgets that the Soviet Union has a great many intercontinental missiles besides the SS-9 and exceeding the SS-9 in numbers by a large amount. These missiles would seem to furnish a reserve that might satisfy a military strategist.

Third, he assumes overall reliabilities that are quite a bit lower than the reliabilities that Dr. Rathjens and I assumed, also lower than those attributed to the SS-9. As a result of the three assumptions, Dr. Lapp's Russians would have substantially less than half as many reliable arriving reentry vehicles as our thousand Minuteman silos. More than half the Minutemen force would then be untouched by SS-9 reentry vehicles.

Finally, Dr. Lapp makes an assumption that is plainly absurd. He supposes that even though each warhead has a very high probability of destroying a single silo, "any military realist" would fire two of his outnumbered attacking reentry vehicles at each silo that is attacked.

⁴ CEP is the acronym for "Circular Error, Probable," a commonly used measure of the inaccuracy of weapon systems. In repeated firings, 50% of the weapons would miss their targets by less than the CEP (or median miss distance) and 50% would miss by more than the CEP. A frequent misinterpretation assumes that all weapons miss their targets by a distance equal to the CEP—which is like assuming that all students score at the 50th percentile on an exam.

A nautical mile is 6,080 feet. It, rather than a statute mile, is a standard dimension for measuring CEP or median miss distance.

This would leave $\frac{3}{4}$ of the silos untouched. But if each warhead has a 99% probability of destroying a single silo, firing two at one silo would merely increase the probability of destroying that specific silo to 99.99% but would make it quite certain that a silo that could have been destroyed will go unscathed. If a more sensible tactic were followed, namely to fire each of the two missiles at a different silo, there would be a probability of 98% of destroying both silos and a probability of 99.99% that at least one of the two would be destroyed. (This latter is the same probability that Dr. Lapp would have achieved against the specific one that he was aiming at.) In short, Dr. Lapp's tactic would greatly reduce the expected level of destruction achieved by the attack, and it would not increase the probability of achieving some minimum level of destruction. I know of no military realist who would regard Dr. Lapp's tactic as a sensible one for the attacker. I must agree with Dr. Wigner that Dr. Lapp has presumed that his adversary would be unbelievably stupid.

It should be observed that the absurdity of the tactic is not dependent on the roughly 99% single shot kill probability implicit in Dr. Lapp's accuracy, yield and resistance assumptions. If one were to use a 95% single shot destruction probability, the point is equally obvious. In this latter case, an adversary who assigned one missile to each of two targets would have a better than 90% chance of getting them both and a probability of 99 and $\frac{3}{4}$ % of getting one; and he could get no better than a 99 and $\frac{3}{4}$ % probability of getting at least one silo if he sent both missiles against one silo. In the latter case, however, he could destroy at *most* one silo.

Prof. Chayes and Dr. Panofsky have made statements suggesting they also accept the principle of sending at least two missiles to each silo.

Prof. Chayes in his statement to the Committee on April 23: ". . . it is agreed that the attacker would need at the very minimum 2,000 accurate warheads—two for every one of our silos—before being able to think about a first strike."

Prof. Panofsky in his statement to the Committee on April 22: "Moreover, an attacker would have to compensate for the limited reliability of his force by targeting at least two and possibly more warheads against each of the 1,000 Minuteman silos."

The reasoning behind these two statements is less explicit than Dr. Lapp's. Dr. Panofsky is talking about compensating for unreliability rather than inaccuracy, but it seems plain that no such universal rule makes sense.

Dr. Lapp has a second set of calculations published on May 4, 1969 in the *New York Times Magazine*. There he assumes the Russians may have 500 rather than 333 SS-9s. Since he again assumes three reentry vehicles per booster, this makes a total of 1500 reentry vehicles per booster. He apparently avoids the obviously bad strategies of reserving a quarter of the force, and then using the remainder to attack only half the targets they are capable of destroying with high probability. Nonetheless, once again his calculations show very high survival rates: "500 to 750 operable Minuteman." With these changed assumptions, how does the outcome continue to remain so favorable to Minuteman's survival?

Dr. Lapp has made some other changes. He has reduced the yield of the SS-9 reentry vehicles by 20%, increased his estimate of the hard-

ness of the Minuteman by 50%, and most important, he now uses very large inaccuracies for the SS-9, 3600 feet in one case and 5500 feet in the other. The latter great inaccuracy assures him his 750 operable Minuteman surviving. But there is no justification for assuming such great inaccuracies in the mid-and late 1970s. One of the few constants in Dr. Lapp's various calculations appears to be his conclusion.

Calculations of Dr. Steven Weinberg and Dr. Jerome Wiesner in ABM: An Evaluation of the Decision to Employ an Anti-Ballistic Missile System edited by Abram Chayes and Jerome Wiesner, 1969.

Dr. Weinberg and Dr. Wiesner present variants of the same calculation to show the safety of the Minuteman force. Dr. Weinberg supposes that at least 2100 reliable arriving reentry vehicles "with megaton yield and high accuracy" would be needed to destroy all but 42 of our 1050 ICBM silos. He appears to assume an 80% single shot kill probability. Dr. Weinberg doesn't indicate the exact blast resistance, yield, and inaccuracy assumptions that go into his 80% hypothetical kill probability and the testimony of Deputy Secretary Packard that he cites in that connection offers no basis for such a determination. Mr. Packard there shows for three different bomb yields a spectrum of probabilities varying from less than 10% to 100% as accuracy varies from a mile or so down below one-tenth of a mile. Mr. Packard does not say what the accuracy of any SS-9 reentry vehicles is expected to be so that no specific single shot kill probability can be inferred from his testimony.

Dr. Wiesner assumes 500 reliable SS-9s, each carrying 3 MIRVs; or more exactly 1500 reliable MIRVs. And he also assumes an 80% kill probability for each arriving reentry vehicle. He justifies this with the statement that a 5-megaton reentry vehicle would have to be used and that "at best the MIRV guidance system will be accurate enough to give only a 0.8 kill probability for the unit." One can read directly from Deputy Secretary Packard's chart that Dr. Wiesner is thus implying that accuracies less than about 2,400 feet are not possible in the time period in question. Dr. Wiesner has given no technical argument to support this assertion; it is at variance with expected accuracies for our own MIRV systems, and it is at variance with the accuracy that the intelligence community *for sometime* has expected the SS-9 to achieve years before the late 1970s time period; and with the accuracy assumed by Dr. Rathjens. At the 5-megaton yield and with the expected SS-9 accuracy the single shot kill probability for each reliable arriving reentry vehicle would be very much higher than 80% as I have already pointed out elsewhere.

If Dr. Wiesner had used three 5 megaton reentry vehicles, the expected accuracy of the SS-9s and, furthermore, had incorporated expected reliabilities his calculation would have shown only 63 out of 1100 hard targets surviving, that is 5.7%. Or if he had used the expected accuracy and reliabilities and the number of 1 megaton vehicles deliverable by the SS-9, he would have arrived at substantially the same result: 68 out of 1100 surviving.

There are a number of less critical flaws in Dr. Weinberg's and Dr. Wiesner's calculations. The essential, however, is that they both assume combinations of accuracy, yield and number of reentry vehicles per booster that are less effective than intelligence expects (and for sometime has expected) of the SS-9.

Calculations of the Federation of American Scientists, March 8, 1969

These calculations of the FAS were published nearly a week before the President's decision on the Safeguard system was announced. The FAS statement was intended to refute in advance the need for extra protection of the Minuteman force. However, the calculations it presents are basically irrelevant since they use only the Russian force "at the present time", and they assume larger inaccuracies than intelligence attributes to the Russians' SS-9s for the later time period. They do not use MIRVs and in fact, according to their author, they do not use the SS-9 at all.

In my statement on April 23rd, I said that the many confident assertions current that Minuteman will be safe without extra protection in the late 1970s are unjustified. These supplementary comments have illustrated and analysed some essential flaws in these assertions: they depend on erroneous estimates about the blast resistance of our own forces or wishful estimates about Russian lacks either in accuracy or in other capabilities or in competent tactics in that time period; they do not, as they claim, use "the most worrisome projections" and the "maximum capabilities" for Russian forces. In fact even my own calculations showing that the Minuteman will be vulnerable if extra protection is not provided do not use "maximum" Russian capabilities. Greater accuracies, for example, are quite feasible in the late 1970s for the Russians. I have used the CEP attributed to the SS-9 in the early 1970s. If the SS-9's CEP should be 250 ft. smaller than that estimate, then only 400 SS-9s using megaton range reentry vehicles would destroy about 95% of the Minuteman force. Or with the larger force even greater percentages of the Minuteman force could be destroyed if we do nothing to supplement its protection. As I emphasized in my statement on April 23, the expected vulnerability of a hardened force is extremely sensitive to the accuracy of the force attacking. The accuracy assumed by Dr. Rathjens and myself is not only attributed to the SS-9 in the early 1970s, it is also the accuracy we estimate for our own MIRVs. Programs for achieving still greater accuracies, for some of our MIRVs have been drawn up though not funded.

I have focused on the problem of protecting Minuteman, because as I have stressed, we need a mixed force and have good reason to preserve the second-strike capability of so large a proportion of our strategic force. Even if it were true that the United States needed only a few strategic vehicles surviving, buying and paying for the operation of a great many that have become vulnerable to attack would be a very poor way to obtain those few surviving. There are safer and cheaper ways of getting a force of a given size than to buy a much larger one, most of which is susceptible to annihilation. To maintain a force, most of which could then be used only in a first strike hardly contributes to stability.

It is sometimes said that such analyses of the potential vulnerability of Minuteman are like the talk of the bomber gap in the early 1950s and the missile gap at the end of the 1950s. Nothing could be further from the truth. Most of those who talked of bomber gaps and missile gaps raised these possibilities to argue for expanding the number of our own bombers or missiles to close the gap. They thought of the problem as one of matching first-strike forces. But how to maintain a second-strike force cannot be adequately understood in these terms.

Whether or not we have it depends, as I have said, not simply on the relative size of two opposing forces, but on a great many characteristics of the attacking force and of the force attacked and its protection. It is the opponents of ABM today who, rather than defend the offense, would simply expand it. Moreover, many of these same opponents of the ABM were among the chief propounders of the missile and bomber gaps in the past; some scientists are now willing to state that they helped "create the myth of the missile gap." My own record on this matter is quite clear. Throughout the 1950s I pointed out the essential irrelevance of matching first strike forces and of all the gap theories that flowed from such matching. For example, in 1956 I wrote:

"Exaggerated estimates of Russian force size, for example, might be used directly to suggest emulation. But we have already made clear that determining who has the best or second best Air Force in being in advance of attack by simply matching numbers or quality is not to the point. Those who assert that we may have fewer and perhaps inferior planes than the enemy and still have a deterrent force must also recognize that we may have more and even better vehicles and yet have inadequate deterrence." *Protecting U.S. Power to Strike Back in the 1950s and 1960s.* (Sept. 1, 1956.)

The propensity simply to list Russian and American pre-attack forces measured in various arbitrary ways continues to be exhibited on both sides of the present debate. On one side, first strike capabilities are sometimes matched against adversary cities in discussions of "over kill." On the other side, first strike forces of Russia and the United States are sometimes matched against each other to show "superiority" or "inferiority" or "parity" or the like. My point is quite different. Foreseeable technical change in the 1970s compels sober thought about improving the protection of crucial elements in our strategic force. Such change can affect our second strike capacity. In that connection, I have centered my discussion on the protection of the Minuteman, but the problem of protecting our bombers is also important and even more we must improve our protection of the national political command vital to the control of sea as well as land-based strategic forces.

EXCHANGE OF LETTERS BETWEEN DR. GEORGE W. RATHJENS AND DR. ALBERT WOHLSTETTER, *THE NEW YORK TIMES*, JUNE 15, 1969

Dr. Rathjens' Letter

To the Editor:

You recently carried a story* about Albert Wohlstetter's criticisms of an estimate I made that 25 per cent of our Minuteman force could be expected to survive a pre-emptive attack by a Soviet SS-9 missile force in the mid-1970's. Mr. Wohlstetter is reported to claim that the "correct" number is 5 per cent.

I have dealt with Mr. Wohlstetter's criticisms in a classified letter, but also feel I should comment on them publicly.

First, there is the question of whether I used the right "hardness" for Minuteman silos in my calculation. I used a chart released by

*Story in *The New York Times*, May 26, 1969, based on May 23 Supplementary Statement by Dr. Wohlstetter to the Senate Armed Services Committee.

Deputy Secretary of Defense Packard and data made available by former Deputy Secretary of Defense Nitze on Nov. 8, 1967.

One cannot determine unambiguously either the hardness of a Minuteman silo or the accuracy we expect with MIRV's from this data. However, by using both releases one can derive a probability for a Minuteman silo being destroyed without knowing the exact hardness. This I did. Any error in estimation of hardness is irrelevant because it is offset by a compensating difference in estimation of accuracy.

PLAUSIBLE THREAT

Second, it is alleged that I made an error in assuming four one-megaton [MT] warheads per SS-9 missile rather than three five-MT warheads as Mr. Wohlstetter assumed. My statement for Senator Albert Gore's subcommittee was prepared before anyone had suggested that the Soviet Union could employ the latter option with the SS-9. I saw no reason to change it, since I continue to regard a payload of less than three five-MT warheads as a plausible threat and because the difference is small compared with the following more important points.

The major difference between Mr. Wohlstetter's analysis and mine is with respect to the extent to which the Russians could retarget some of their missiles to take account of failures of others.

Mr. Wohlstetter has assumed perfect information would be available to them about missile launch failures, failures during powered flight, and failures in separation and guidance of the individual warheads, and that they would be able to use that information with the high confidence required to make a pre-emptive attack a rational choice. I have assumed they would not be able to obtain and use information about such failures in a timely fashion. This accounts for most of the difference in our estimates of Minuteman survival.

There are five far more important points to be made.

There is no hard evidence that the Russians are determined to build a capability to effectively attack our ICBM's.

If they wish to do so, they can build such a capability by the mid-1970's.

If they do so, implementation of the Safeguard plan could be offset by a very small additional Russian effort. Even an expanded Safeguard system would be less satisfactory than other alternatives for strengthening our retaliatory capabilities.

Even if the Russians built the capability to destroy our Minuteman force, pre-emptive attack by them would be madness unless they could discount completely the possibility that we might launch some Minutemen before the arrival of their ICBM's, and unless they could be highly confident of also destroying the other components of our retaliatory strength essentially simultaneously, a possibility that is all but incredible.

The most effective means of insuring the continued viability of the Minuteman force is early agreement to stop MIRV testing and to preclude a large build-up in Soviet ICBM strength. Negotiations to achieve these ends clearly merit higher priority than the deployment of Safeguard.

GEORGE W. RATHJENS,
Cambridge, Mass., June 5, 1969.

Dr. Wohlstetter's Letter*To the Editor:*

Responsible scientists like Drs. Bethe and Ruina, who feel we can delay starting ABM to protect Minuteman, testify that "any one . . . system, bombers, Polaris, Minuteman, has its own vulnerability;" that we need all three; that a threat to Minuteman concerns us gravely. One key issue then is whether that threat will develop by 1976 or 1977 when at the earliest Safeguard will be shaken down—or whether it is safe to wait years for a better ABM.

A disparate variety of calculations by Drs. Rathjens, Weinberg, Wiesner, and Lapp purport to show that it is safe to wait, that an attack by 500 Russian SS-9 missiles would leave untouched anywhere from one-fourth to three-quarters of our Minutemen.

They claim to square with official intelligence. Such confident inferences by scientists carry great authority and ought to be made with the utmost professional care. But despite their widely publicized claims, it is they (not those who would start ABM) who are careless of pre- as well as post-Nixon intelligence, and quite casual in their calculation.

They attribute to an SS-9 in the late 1970's poorer combinations of bomb yield, number of MIRVs, and accuracy than intelligence expects in the early 1970's; and compound these errors by presuming poor Russian tactics or higher blast resistance than designed.

BASIS FOR CALCULATION

In a note to me on his calculations, Dr. Rathjens assumed our silo could resist overpressures two-thirds higher than its design performance; and derived a probability some three-fourths too high that it could survive a 1-MT burst. He bases his probability calculations on doubtfully relevant 1967 testimony about U.S. attacks on adversary silos of unspecified hardness with a range of destruction probabilities. Dr. Rathjens applies the low end of this range to late 1970 SS-9's attacking our silos—which hardly fits a proof that "the most worrisome projections" leave us nothing to worry about. The other end of the range yields roughly the appropriate lower survival probability.

Dr. Rathjens assumes only four one-MT MIRVs in the late 1970's SS-9. But (a) more than four one-MT MIRVs were attributed by pre-Nixon intelligence to the SS-9 in the early 1970s; and (b) an alternative of three 5-MT MIRVs is now public. 500 SS-9s equipped with either of these MIRV options could destroy about 95 percent of Minuteman if the Russians use well-established techniques for reprogramming missiles to replace known failures. Using no reprogramming at all, the 1-MT MIRV force would destroy 92 or 93 per cent of Minuteman. The ability of the five-MT force to destroy 95 per cent of Minuteman presumes only half the failures after launch are replaced—a figure well within the state of the art.

Even limiting the use of information to missile malfunctions before or during launch, the five-MT MIRV force would leave only 8 or 9 per cent surviving. These numbers are intrinsically uncertain—sensitive especially to changing accuracy.

400 SS-9s with one-MT MIRVs and accuracies better by only 250 feet would destroy more Minutemen than 500 with the accuracy expected in the early 1970's.

Dr. Rathjens' belief that variants of Safeguard help retaliation less than available alternatives is based on estimates of costs of these alternatives which I find as casual as his calculations on the threat to Minuteman.

Finally, unlike him, I don't believe a stable, monitorable agreement to limit strategic offense and defense would freeze ABM at zero. ABM can counter improvements in offense accuracy unlikely to be monitored; and can protect population against smaller powers that violate or do not sign the agreement. I doubt the Russians would accept a total ban on ABM.

ALBERT WOHLSTETTER,
University of Chicago, Los Angeles, June 11, 1969.

LETTER BY DR. GEORGE W. RATHJENS TO *THE NEW YORK TIMES*,
JUNE 22, 1969

To the Editor:

In your issue of June 15 you published a letter from me regarding Safeguard and a rebuttal by Albert Wohlstetter imputing to me assumptions and statements I did not make.

Mr. Wohlstetter implies that my calculations were meant to apply to the late 1970's. They were not, as perusal of my letter and Congressional statements will show. All references by me are to the mid-1970's or in one case specifically to 1975. I have never denied that by the late 1970's the Soviet Union could, if it wished, have a capability to destroy nearly all of our Minuteman force in a pre-emptive attack.

He states that, in using information released by former Deputy Secretary Nitze regarding MIRV effectiveness against hardened missile sites, I used the low end of Mr. Nitze's estimates. I did not. Had I done so I would have calculated 30 per cent survival for our Minuteman force. I used the median of the two values given by Mr. Nitze.

Mr. Wohlstetter charges me with having used "casual" cost estimates in my analysis. No cost estimates appeared in my letter. The only relevant figure in testimony by me was a marginal cost for Minuteman procurement of \$4 million per missile, a figure consistent with testimony provided by various Defense officials over the last years.

He implies that I believe a "stable, monitorable agreement to limit strategic offense and defense would freeze ABM at zero." I have neither said nor implied any such thing. I have said that I believe nationwide ABM deployment by either side would be a serious impediment to reaching an arms limitation agreement.

The quality of the debate regarding Safeguard would be improved if Mr. Wohlstetter would try to make his case by arguing its merits and by rebutting his opponents' analyses, not by misrepresenting their views. In doing the latter, he imposes on The Times, its readers, and the nation.

GEORGE W. RATHJENS,
Cambridge, Mass., June 16, 1969.

LETTER BY DR. ALBERT WOHLSTETTER TO *THE NEW YORK TIMES*,
JUNE 29, 1969

To the Editor:

Space permits only brief reply to George W. Rathjens's defense of his calculations that 25 per cent of Minuteman would survive an attack by 500 SS-9's.

One key point: his results, no matter how derived, simply do not jibe with the designed blast resistance of Minuteman silos and pre-Nixon intelligence estimates of SS-9 performance by 1972.

He says he used the median rather than the lower of Deputy Defense Secretary Nitze's two hypothetical kill probabilities. But he wrote me earlier that he assumed a .6 probability for a one-megaton [MT] weapon against a Minuteman silo. The lower of Mr. Nitze's two probabilities, not their median, scales to .61 at one-MT using the familiar cube root approximation; and even higher—to .69—using more exact methods.

Mr. Rathjens erred in stating his assumptions; or in his inference from this doubtfully relevant 1967 hypothetical; or both. The gist of the matter is that with expected MIRV performance 500 SS-9's could destroy some 95 per cent of Minuteman.

Safeguard will not be deployed until 1976, or shaken down until 1977. It is plainly directed at a threat in the late nineteen-seventies. For Mr. Rathjens to suggest that his calculations don't apply after 1975 is to suggest they don't apply at all.

One alternative to Safeguard is to expand Minuteman. Mr. Rathjens cites a \$4-million cost for a Minuteman. The relevant marginal systems costs are twice that or more.

The Defense Department was much criticized for omitting the incremental cost of ABM warheads—which made a difference of a few percent. For Minuteman, Mr. Rathjens appears to leave out silos, initial personnel training, training equipment, spares, land purchase and much else. On the other hand, the ABM costs he cites include land purchased, construction, all hardware investment, and initial training, and are a phase of a program serving several functions besides the defense of Minuteman.

These are only some of the flaws. To say that Mr. Rathjens's costs are casual, as I do, is to be courteous.

I should think the quality of the debate on this complex issue might improve if less time were spent in propagating quick analyses and more in improving their quality, if we used the authority of science less and its methods more.

ALBERT WOHLSTETTER,
University of Chicago, Chicago, June 25, 1969.

