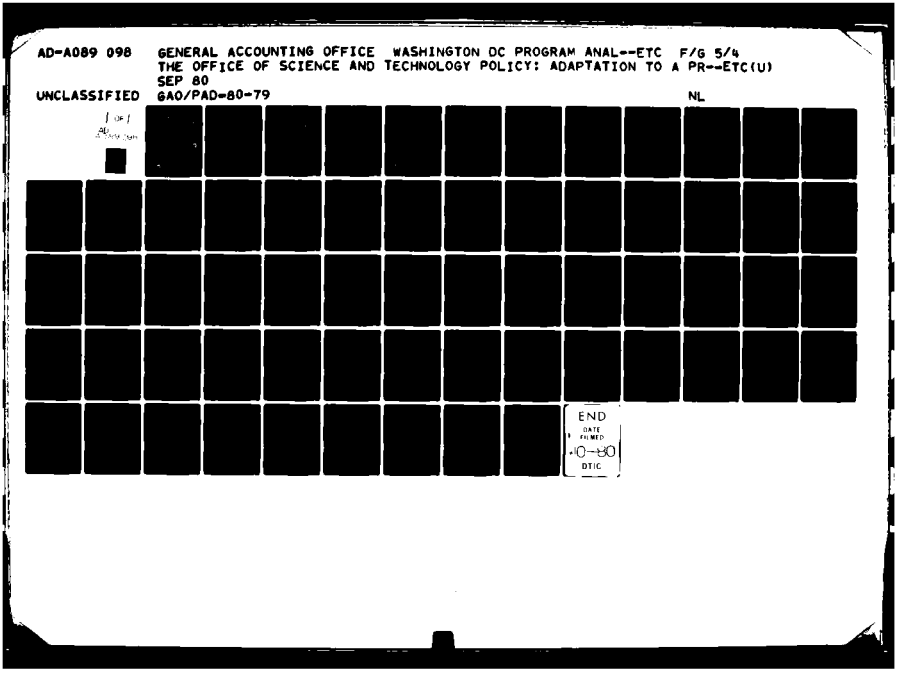
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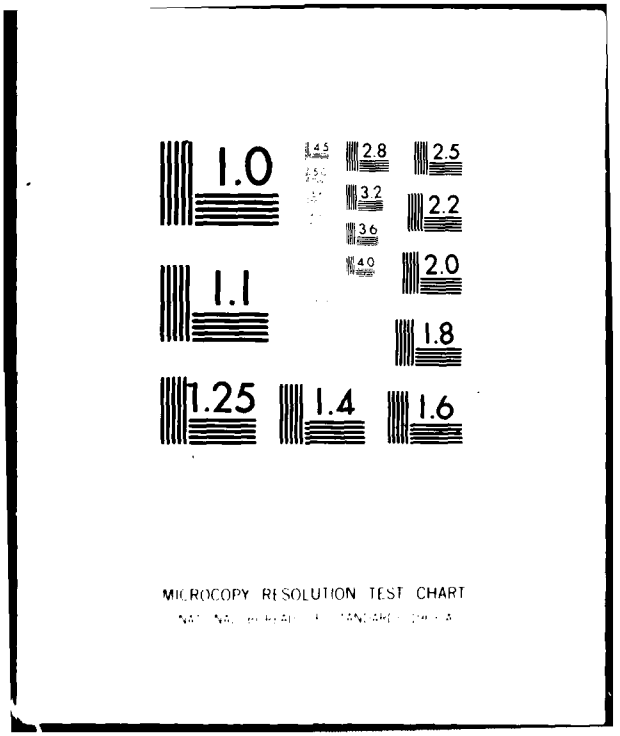
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REPORT BY THE

# Comptroller General

OF THE UNITED STATES



(6)

# The Office Of Science And Technology Policy: Adaptation To A President's Operating Style May Conflict With Congressionally Mandated Assignments

GAO recommends that OSTP either perform a comprehensive study of the Federal role in science and technology, as originally mandated to the President's Committee on Science and Technology, or suggest legislation for the Congress to relieve OSTP of the mandate.

OSTP's approach to strategic planning emphasizes topical or mission issues. OSTP does not consider it feasible to do comprehensive strategic planning within the current policy-making environment. Notwithstanding the constraints on OSTP, its Director should establish a formal means for identifying emerging issues and suggesting priorities. The Congress should consider mechanisms alternative to OSTP for identifying such emerging issues and examining OSTP's work agenda. The Congress should consider whether OSTP gives enough attention to the interactions among topical strategies for science and technology and to Federal policies intrinsic to the governance and support of science and technology.



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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-199498



The Honorable Adlai E. Stevenson
Chairman, Subcommittee on Science
Technology, and Space
Committee on Commerce, Science, and
Transportation
United States Senate

Dear Mr. Chairman:

This report on the Office of Science and Technology Policy (OSTP) was done at your request. In this report, we develop a profile of OSTP, describe OSTP's compliance with the legislated mandate of Title III in Public Law 94-282 for a study on Federal organization and management of science and technology policy, and discuss the extent to which OSTP is involved in strategic planning for science and technology. We include a number of recommendations to OSTP, and raise several issues for congressional consideration.

The subject studied in this report is of concern to many legislators. Accordingly, as arranged with your office, we are sending this report to several other interested congressional committees.

Copies are also being sent to the Director, Office of Science and Technology Policy; the Director, Office of Management and Budget; the Director of the National Science Foundation; and the Chairman of the National Science Board.

Sincerely yours,

Comptroller General
of the United States

A

REPORT BY THE
COMPTROLLER GENERAL
OF THE UNITED STATES

# THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY: ADAPTATION TO A PRESIDENT'S OPERATING STYLE MAY CONFLICT WITH CONGRESSIONALLY MANDATED ASSIGNMENTS

## D I G E S T


The Chairman of the Subcommittee on Science, Technology, and Space of the Senate Committee on Commerce, Science, and Transportation asked GAO to study the Office of Science and Technology Policy (OSTP). The request has two parts. The first is to examine the extent to which OSTP has studied the thirteen issues on Federal organization and management of science and technology policy (listed on pp. 11 and 12). This study was originally assigned to the President's Committee on Science and Technology under Title III of Public Law 94-282 but was transferred to OSTP under Reorganization Plan Number 1 of 1977, as implemented by Executive Order 12039. The second part of the request asks GAO to determine the extent to which OSTP is involved in strategic planning for science and technology.


### PROFILE OF OSTP

In this Administration, top officials of OSTP believe that the broad legislative mandate for OSTP cannot be met fully under present conditions and operating styles within the Executive Office of the President. OSTP management and staff also believe that all their work must be tied to the existing policymaking process in the Executive Office of the President, because they have no independent control over any portion of the U.S. policymaking system.

OSTP interprets its environment as requiring it to be continually active--initiating its own work and then fostering implementation of its recommendations, many of which demonstrate a strategic perspective. OSTP is perhaps most active in its extensive collaboration with the Office of Management and Budget in the research and development budget process.

## THE THIRTEEN ISSUES IN TITLE III

GAO found that OSTP does not intend to prepare the mandated comprehensive survey report (p. 14). GAO believes that transferring this assignment to OSTP placed a large burden on OSTP because this significantly increased its responsibilities without increasing its resources. The mandate requires a comprehensive study, the preparation of which was intended to be the sole responsibility of an independent committee of nationally known senior individuals. Under present circumstances, the small and active OSTP has produced no comprehensive report but a list of its many activities, categorized according to the thirteen areas listed in Title III.

## STRATEGIC PLANNING FOR SCIENCE AND TECHNOLOGY

GAO found that the OSTP staff attempts to give a strategic perspective to considerations of topical or mission issues (such as energy and space). OSTP believes that it is not feasible to do more comprehensive strategic planning and remain effective in the Executive Office of the President. OSTP seldom studies the relationships of issues in the whole context of science and technology in society; instead, it usually focuses on a particular mission issue in isolation from its interactions with other national concerns. OSTP also gives lower priority to issues intrinsic to the governance and support of science and technology (pp. 16-23).



Many constraints--including OSTP's small size and its perceptions of the operating style of the President and the President's senior advisors--inhibit OSTP's further involvement in comprehensive strategic planning. GAO believes, however, that within existing constraints OSTP can establish a systematic and formal mechanism for identifying long-range emerging issues and for providing a detached perspective in screening outside proposals for OSTP's agenda (p. 27).

Under Reorganization Plan Number 1 of 1977 and the subsequent implementation by Executive Order 12039, formal responsibility for the Annual Report and the Five-Year Outlook was transferred from the Director of OSTP to the Director of the

National Science Foundation (NSF). However, GAO believes that the Director of OSTP remains the principal spokesperson for the Administration's views and strategies with regard to science and technology. Therefore, even though the Director of NSF has formal responsibility for the preparation of the Annual Report and the Five-Year Outlook, the Director of OSTP will be perceived as responsible for the contents of these reports. GAO found that NSF believes it has received too little guidance from OSTP in preparing the Annual Report and the Five-Year Outlook (p. 21). Both OSTP and NSF are taking steps to improve communication in planning and preparing these reports.

## RECOMMENDATIONS TO THE DIRECTOR OF OSTP

GAO recommends that the Director of OSTP:

--prepare the comprehensive report originally mandated by Title III of Public Law 94-282 or suggest legislation for the Congress to relieve the Office of this mandate.

--establish some formal mechanism for providing a detached view of issues for its agenda. The mechanism should help OSTP identify emerging issues, screen the many external suggestions for OSTP's work, examine interrelationships among issues, and suggest priorities.

--take greater initiative in selecting issues for the Annual Report and the Five-Year Outlook.

## ISSUES FOR CONGRESSIONAL CONSIDERATION

Is a comprehensive survey of the Federal role in science and technology, under the Title III mandate, still needed? If so, what mechanisms alternative to OSTP could undertake it?

Should some other mechanism be established to identify and rank emerging issues pertaining to science and technology? Such mechanisms might assist the Congress to critically examine selection of priorities for OSTP's agenda and the analysis of issues included in the Five-Year Outlook.

Tear Sheet

Does OSTP sufficiently balance its mission-related work by giving enough attention to (1) the interactions and trade-offs among topical or mission-based strategies involving science and technology and (2) Federal policies designed for the governance and support of science and technology?

How can the Congress and the OSTP Director best identify and resolve concerns about the Director's choices of operating style? Is the OSTP legislative mandate too comprehensive? What other means might fulfill congressional needs for information and analysis not provided by OSTP?

## AGENCY COMMENTS

OSTP comments to GAO's draft report may be separated into two categories. OSTP is in general disagreement with GAO's view that OSTP has not fulfilled its broad legislative mandate. OSTP believes that its many activities and full integration into the policy process of the Executive Office of the President fulfill its mandate. While GAO agrees that this integration fulfills a large part of OSTP's responsibilities, OSTP has not complied with the statutory requirement that was transferred to it to produce the Science, Engineering, and Technology Survey. The second category of OSTP comments pertain to specific statements in the draft report that OSTP disagreed with or believed to be misleading. GAO's complete response to the OSTP comments, as well as references to where potentially misinterpreted wording has been changed, is contained in appendix IV.

Appendix V contains comments from the Director of NSF and GAO's response.

# Contents

## ABBREVIATIONS

| | |
|---|---|
| DOE | Department of Energy |
| FCCSET | Federal Coordinating Council for Science, Engineering, and Technology |
| ISETAP | Intergovernmental Science, Engineering, and Technology Advisory Panel |
| NAS | National Academy of Sciences |
| NSF | National Science Foundation |
| OMB | Office of Management and Budget |
| OSTP | Office of Science and Technology Policy |
| PCST | President's Committee on Science and Technology |
| PSAC | President's Science Advisory Committee |

## CHAPTER 1

## INTRODUCTION

The Subcommittee on Science, Technology, and Space of the Committee on Commerce, Science, and Transportation is responsible for overseeing that the National Science and Technology Policy, Organization, and Priorities Act of 1976 (Public Law 94-282) is properly implemented. Accordingly, Senator Adlai Stevenson, Chairman of the Subcommittee, asked GAO to review two activities of the Office of Science and Technology Policy (OSTP), whose charge is to implement the the act. His request asked us to determine:

"1. The extent to which OSTP has covered the thirteen areas assigned for study to the President's Committee on Science and Technology by Title III of Public Law 94-282. Although the President's Committee was abolished by the first Reorganization Plan of 1977, the Subcommittee is interested in determining if these thirteen areas have been studied.

"2. The extent to which OSTP is involved in strategic planning for U.S. science and technology. Please include in your evaluation any OSTP involvement in drafting the Annual Report, the Five-Year Outlook, and any other relevant work. This aspect of your study would be particularly useful if it could identify the constraints on OSTP in conducting this form of planning."

In our study, we address both questions. To respond to the first, we obtained OSTP's view of the President's Committee on Science and Technology (PCST) and the mandate to prepare a thirteen-area survey, transferred to OSTP from PCST by Executive Order 12039. We also investigated the extent to which PCST had completed the work assigned to it before it was abolished in 1977, and we obtained a list of OSTP activities related to the thirteen issue areas of Title III, which will be found in appendix II.

To address Senator Stevenson's second question, we obtained OSTP's own view of its role in strategic planning, as illustrated by examples of its work. Then we analyzed this self-characterization in the context of a composite definition of Government strategic planning for science and

technology. We derived the context by synthesizing a variety of others' perceptions.

We interviewed many key figures associated with Federal science and technology policy. We held extensive discussions with top management, including the Director and the entire professional staff of OSTP (except for OSTP staff connected directly to ISETAP, the Intergovernmental Science, Engineering, and Technology Advisory Panel), and we spoke with several members of the former PCST, including its Executive Director. (See appendix III for the list of questions discussed with OSTP staff.) We conducted interviews with the Director and Deputy Director of the National Science Foundation (NSF), the Assistant Director of the NSF Directorate for Science, Technology, and International Affairs, and other senior officials and professional staff members at NSF responsible for the Annual Report and the Five-Year Outlook. We also interviewed several members of the National Academy of Sciences who helped prepare the Five-Year Outlook.

Because of OSTP's relation to the Executive Office of the President and other agencies, we interviewed officials within several divisions of the Office of Management and Budget who are responsible for agency research and development budgets and for screening agency submissions for the Five-Year Outlook. We talked at length with several present and former members of the Executive Office of the President, with several former members of the President's Science Advisory Committee, and with other experts from the science and technology policy community.

Finally, we augmented our interviews with information from speeches, congressional testimony, a report by the Congressional Research Service of the Library of Congress,1/ and other literature. Four consultants helped us design our study and review our draft report.

We restricted ourselves as much as possible to the two objectives set by Senator Stevenson. We did not attempt, for example, to assess the competence of OSTP or to judge the technical merit of any OSTP effort. We did not review the content of the science and technology annual reports or the Five-Year Outlook. We did not examine the role of either the Federal Coordinating Council for Science, Engineering,

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1/ Dorothy M. Bates, Implementation of the National Science and Technology Policy, Organization and Priorities Act of 1976 (P.L. 94-282): A Two-Year Status Report, Congressional Research Service, August 30, 1978.

and Technology or ISETAP--the two adjuncts to OSTP. We did not examine OSTP's classified work in national security.

In chapter 2, then, we present our perception of OSTP's self-characterization as a profile of its organization, operating philosophy, and agenda. This is background for the two study objectives. In chapter 3, we discuss the extent to which OSTP has fulfilled the requirement of the survey mandate in Title III of Public Law 94-282 and Executive Order 12039. In chapter 4, we describe OSTP's approach to strategic planning activities and briefly discuss approaches OSTP has not taken. Finally, in chapter 5, we summarize the issues that we believe merit further consideration.

## CHAPTER 2

## A PROFILE OF OSTP

### BACKGROUND

A science and technology advisory body has existed in one version or another within the Executive Office of the President since World War II. By Executive Order in 1973, President Richard Nixon abolished the one then current. In May 1976, the Congress passed the National Science and Technology Policy, Organization, and Priorities Act (Public Law 94-282), establishing the Office of Science and Technology Policy (OSTP). Its Director is authorized to serve as scientific and technical advisor to the President on major policies, plans, programs, and organization of the Federal Government. The Director is charged additionally with establishing and heading an Intergovernmental Science, Engineering, and Technology Advisory Panel (ISETAP), whose purpose is to identify and define State, regional, and local problems that science and technology can help solve.

Title III of the act calls for a President's Committee on Science and Technology (PCST). Composed of qualified individuals from the industrial, scientific, and academic communities, PCST was charged with completing, within 2 years, a comprehensive survey of Federal science, engineering, and technology objectives, policies, programs, and organization. Reorganization Plan Number 1 of 1977, as implemented by Executive Order 12039, abolished PCST, transferring its reporting functions to OSTP while the Office of Management and Budget (OMB) was delegated responsibility for issues of reorganization and Federal and State liaison. The Executive order required, further, that OSTP advise OMB in fulfilling its assignment. The congressionally approved reorganization plan and subsequent Executive order resulted in several other changes in the duties of OSTP and its Director.

Title IV of the act establishes a Federal Coordinating Council for Science, Engineering, and Technology (FCCSET), whose purpose is to recommend ways of effectively planning Federal scientific programs that involve more than one agency and, at the same time, to identify research areas that require additional emphasis.

### ORGANIZATION

OSTP's professional staff number about fifteen, excluding individuals assigned primarily to ISETAP, and it has a budget of about $3 million. Dr. Frank Press is the current

Director and President Carter's Science Advisor. Within his office are two additional senior professionals, the Executive Officer and the Assistant to the Director.

The three major groups in OSTP each consist of six or seven professional staff members and a few secretaries. Each group is responsible for one of the following sets of policy issues: (1) national security and international and space affairs, (2) human resources and social and economic services, and (3) natural resources and commercial services. Issues that cut across organizational lines, like remote sensing of natural resources from space, are handled jointly. Individual staff members appear to be highly knowledgeable, with a wide range of expertise.

OSTP supplements its small size in several ways. It employs a few specially trained people detailed from outside OSTP to work on particular issues. It employs a number of part-time consultants, and it commissions ad hoc panels and committees for specific studies. These may contain scientific or technical experts and individuals with broad governmental policy vision.

By supplementing its staff in this way, OSTP can address more issues, but it is also more free to deal with day-to-day events and immediate Presidential needs. OSTP states, moreover, that advice from the industrial and academic communities helps it complete specific assignments and identify potential issues for its agenda. According to Dr. Press, these "mini-PSAC's" perform many functions of the original PSAC panels. OSTP has rejected establishing a formal and institutional advisory committee, partly because it has access to these mini-PSAC's and consultants.

OSTP obtains additional resources by means of contract studies. It may commission the National Research Council, technical societies, or private consulting firms to undertake special assignments, if it finds that it lacks sufficient expertise on any issue.

Finally, OSTP works regularly with various offices within the National Science Foundation (NSF). Members from both organizations often contribute time and effort cooperatively. In other instances, NSF may be asked to assume full responsibility for completing particular studies.

## PHILOSOPHY

For his 1977 nomination hearings before the Senate Committee on Commerce, Science, and Transportation, Dr. Frank

Press wrote that the President's Science Advisor "operates in a political world * * * his work is of government primarily, not the work of science itself." He added that "generally * * * we look upon science and technology * * * as a means of accomplishing societal goals."1/ Over the past 3 years, the predominant attributes of this consistently applied philosophy have become that:

- o the science and technology components of national issues are studied as they relate to present Government missions or known problems or issues and

- o efforts are made to see that this country invests in a strong science and technology enterprise to achieve national goals and maintain international competitiveness.

The science and technology components of national issues are determined primarily by Government missions in energy, space, agriculture, and so on. Accordingly, OSTP asks: What do we need from science and technology to fulfill these missions, and how do we get it? This contrasts with inquiry about what science and technology offer and how this can be used. In addition, OSTP considers a few not yet fully defined issues to determine whether they are serious enough to warrant attention and action by various people at high Government levels.

The second attribute of OSTP's philosophy is the belief that the United States must support research and development strongly and consistently, particularly basic research, as an investment for the future, not just another year-to-year discretionary expense. The purpose of investment is to support continued economic vitality, international competitiveness, and contributions toward achieving society's objectives. Government support of research and development takes several forms, including policies that help fund universities and regulatory, tax, and patent policies that affect industrial innovation as well as assessments of future needs in education and human resources. Many issues under this "support" attribute are called "crosscutting" issues, because they transcend established Government missions.

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1/ Nominations April-May: Hearings Before the Senate Comm. on Commerce, Science, and Transportation, 95th Cong., 1st Sess. 42 (1977).

In other words, the crosscutting issues relate to "stewardship of science" or "policies for science," whereas the science and technology components of Government missions are addressed as "science and technology for national policy goals." OSTP believes making policy for science is important but secondary to the uses of science and technology for national policy. Stewardship of science itself serves the broader national interest.

Realizing pragmatically that they do not independently control a part of the Administration's policymaking process, the present OSTP staff identify and take advantage of key access points to decisionmaking within the Executive Office of the President. On any given issue, OSTP may not be involved in the entire sequence of activity leading to a decision, whether participating in the budget process or in some phase of study and recommendation by standing and ad hoc interagency panels. For example, OSTP played a major role in initiating the Domestic Policy Review on Industrial Innovation and in reviewing the resultant conclusions and recommendations but OSTP played only a limited role in the actual study. OSTP claims to have influenced a broad range of similar long-term and strategic issues. Early in 1979, Dr. Press wrote: "we are an integral part of the White House team and find ourselves at the heart of the Administration's decision process on scientific and technological issues."1/

OSTP tries to provide the President and other Executive offices with timely advice and analysis, and it tries to gear almost all its activities to some form of implementation. Obviously, this operating philosophy does not leave room for comprehensive study, analysis, or reporting. Dr. Press believes that if it engaged primarily in thinking about science and technology, simply analyzing and writing reports about it, OSTP would cease to exist, at least in the Executive Office of the President.

But what about the Annual Report, the Five-Year Outlook, the Science, Engineering, and Technology Survey, or any comprehensive evaluation or strategic planning document on science and technology? Although such documents are viewed as having some importance as communications to the Congress and the public, OSTP does not see its operations as consonant

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1/ House Comm. on Science and Technology, National Science and Technology Policy Issues, 1979, Part I, A Compendium of Papers, 96th Cong., 1st Sess. 3 (1979).

with the effort necessary to produce them. Any study done by OSTP, therefore, either responds to a request from the Executive Office of the President or anticipates an issue requiring a high-level decision. This is consistent with OSTP's emphasis on working directly with existing Government missions.

Perhaps the keystone of OSTP activities is that it recognizes the importance of the budget process, as we shall see in chapter 4. In addition to its interest in the funding of research and development in support of agency missions, OSTP participates in OMB's reorganization studies as they relate to science and technology. We were told, for example, that OSTP had been involved in the formation of the Office of Energy Research in the Department of Energy as well as in reorganizing the Nuclear Regulatory Commission. OSTP watches over research and development in the agencies chiefly by means of its activity with OMB.

Dr. Press believes that, except for interagency programs and selected problems, OSTP should generally stay out of planning by agencies for their own missions. Dr. Press told us, however, that he is stepping in to help strengthen strategic planning in some agencies in which it is weak.

## AGENDA

The key words in OSTP's agenda are "professional judgment," exercised in a dynamic environment of new and changing issues. From one-third to one-half of OSTP's work is assigned by the President, including Presidential approval of OSTP proposals. The remaining work is initiated from perceptions by Dr. Press and his staff of the urgent influx of influence, advice, and complaints from others within the Executive Office of the President, department and agency heads, congressional leaders and staff, industrial and university leaders, members of the science and technology community, and the general public. They feel they have neither need nor time to crank up a formal mechanism that systematically churns out lists of additional issues.

All this translates, in our view, into a very fluid operation for a relatively small staff. They have many meetings and make many personal contacts without rigid requirements for documenting time or effort spent on individual projects. We were told that Dr. Press participates in the daily White House Senior Staff meetings and that he also convenes a daily meeting of the OSTP senior staff. The staffs of the OSTP groups meet frequently, as do the entire OSTP professional staff. Suggestions for OSTP work come from every

level. Dr. Press allows the groups a fair amount of discretion in beginning minor efforts, but he is consulted before work is begun that might require significant resources or lengthy involvement.

## CHAPTER 3

## MEETING THE PCST/SURVEY MANDATE

### BACKGROUND

Title III of the National Science and Technology Policy, Organization, and Priorities Act of 1976 established the President's Committee on Science and Technology (PCST) and directed it to conduct a comprehensive survey of the Federal science and technology effort. The survey was to be prepared by the ten members of the Committee who had been appointed by President Gerald Ford in October 1976. These were nationally known figures from public offices, universities, industry, and research facilities. PCST was to study broad issues in the organization and management of science and technology policy and to report its conclusions and recommendations to the President within 2 years. The President was required to transmit the report with his comments to the Congress.

PCST was not permitted to complete its task, however. In Executive Order 12039, implementing the first Reorganization Plan of 1977, President Jimmy Carter abolished the Committee and transferred all its reporting requirements to OSTP, while OMB was delegated responsibility for issues of reorganization and Federal and State liaison. The Executive order required, further, that OSTP advise and aid OMB in fulfilling its assignment. Although OSTP has not fully complied with the legislative mandate, it has taken some pertinent actions, as we shall see.

Some people we interviewed compared PCST to the Baker and Ramo panels established by President Ford in 1975, but these had little similarity to PCST and were convened specifically to help OSTP establish its agenda. Many others likened PCST to the President's Science Advisory Committee (PSAC). They believe that, in addition to producing a report, PCST was created to carry on continuing advisory discussion and analysis of crucial issues, the more important of the two tasks according to several people we spoke to. Some of them also believe that PCST was intended to build bridges between Government and the independent science and technology community.

The most important of significant differences between PCST and PSAC, however, is that PCST had a predetermined, legislated agenda of issues to examine and a report to complete within a specified time, after which it would have continued to exist only if the President had wanted it to. According to the legislative history of Title III of Public Law 94-282, PCST was established to study many of the same

issues covered in Science and Public Policy, a five-volume report by John R. Steelman in 1947. The Congress considered the survey report necessary because no comprehensive study of the direction of Federal science and technology policy had been made in 30 years.

Section 303(a) of the act mandated PCST to do the following specific things:

> "* * * survey, examine, and analyze the overall context of the Federal science, engineering, and technology effort including missions, goals, personnel, funding, organization, facilities, and activities in general, taking adequate account of the interests of individuals and groups that may be affected by Federal scientific, engineering, and technical programs, including, as appropriate, consultation with such individuals and groups. In carrying out its functions under this section, the Committee shall, among other things, consider needs for--
>
> "(1) organizational reform, including institutional realinement designed to place Federal agencies whose missions are primarily or solely devoted to scientific and technological research and development, and those agencies primarily or solely concerned with fuels, energy, and materials, within a single cabinet-level department;
> (2) improvements in existing systems for handling scientific and technical information on a Government-wide basis, including consideration of the appropriate role to be played by the private sector in the dissemination of such information;
> (3) improved technology assessment in the executive branch of the Federal Government;
> (4) improved methods for effecting technology innovation, transfer, and use;
> (5) stimulating more effective Federal-State and Federal-industry liaison and cooperation in science and technology, including the formation of Federal-State mechanisms for the mutual pursuit of this goal;
> (6) reduction and simplification of Federal regulations and administrative practices and procedures which may have the effect of retarding technological innovation or opportunities for its utilization;
> (7) a broader base for support of basic research;

(8) ways of strengthening the Nation's academic institutions' capabilities for research and education in science and technology;

(9) ways and means of effectively integrating scientific and technological factors into our national and international policies;

(10) technology designed to meet community and individual needs;

(11) maintenance of adequate scientific and technological manpower with regard to both quality and quantity;

(12) improved systems for planning and analysis of the Federal science and technology programs; and

(13) long-range study, analysis, and planning in regard to the application of science and technology to major national problems or concerns."

## PCST ACCOMPLISHMENTS

President Ford appointed the PCST in the fall of 1976. Between November 1976 and February 1977, it held three meetings, during which it more clearly defined the thirteen topics specified in the legislation and developed an approach for fulfilling its charter. The thirteen topics identified a specific agenda. According to its former Executive Director, PCST intended to assess the magnitude of each topic and to recommend actions to the Federal Government, expecting to produce a report that would cover all the issues and their interactions.

PCST's last official act, however, was to record the results of its work as of the middle of April 1977. For most of the assigned topics, this report described the issue, provided background on congressional interest, identified principal subissues, suggested procedural options, and provided a list of potential resources and references. The Executive Director also submitted a memorandum to the Director of OSTP, briefly presenting PCST's recommendations for disposing of each issue. After completing these documents, PCST disbanded, with the hope that if another group were to carry its work forward, PCST's efforts would provide an appropriate start.

## OSTP ACCOMPLISHMENTS

As we saw in chapter 2, OSTP is a quite different kind of entity from PCST. Unlike PCST, OSTP does not have a termination date or a finite set of tasks. Unlike PCST, OSTP has an agenda that is fluid and continually changing, and it operates from a philosophy of the role of science and technology in national policy rather than from the limits of a

specific survey. Furthermore, we were advised that OSTP's agenda is not driven by the Title III issues, although many of OSTP's accomplishments and activities can be categorized according to the issues originally assigned to PCST. OSTP also has no plan to prepare a report comprehensively addressing the study issues set out by Title III.

The first issue in Section 303(a) of the act requires a survey of the need for "organizational reform, including institutional realinement designed to place Federal agencies whose missions are primarily or solely devoted to scientific and technological research and development, and those agencies primarily or solely concerned with fuels, energy, and materials, within a single cabinet-level department." OSTP has helped establish the Office of Energy Research in the Department of Energy, has helped propose a Department of Natural Resources, and has helped determine which science education activities to transfer from the National Science Foundation to the Department of Education. Furthermore, OSTP has nearly completed a report on whether scientific and technological activities should be organized within a single Department of Science and Technology.

The second issue requires attention to scientific and technological information systems. OSTP has established under the Federal Coordinating Council for Science, Engineering, and Technology an ad hoc committee set up specifically to identify steps to improve information systems.

This committee has five items on its agenda:

- o the role of central Government-supported clearinghouses,
- o relations with the private sector,
- o accessibility and pricing policies,
- o the role of Federal national libraries, and
- o the status of research and information technology.

On the issues of energy and information systems, then, OSTP initiatives relate directly to Title III concerns. This is not true of all thirteen issues specified in the legislation, however. For example, issue number 3 required PCST to study the need for improved technology assessment in the executive branch of the Federal Government. OSTP was assigned responsibility for this issue, but it has not comprehensively analyzed the Federal Government's organization, management,

or use of technology assessment, nor is it evaluating performance or recommending improvements in the executive branch.

OSTP's technology assessments are instead directed to quite specific problems that currently confront the Administration and the Nation. For example, OSTP says that it has complied with Title III objectives by studying the future of the automotive diesel engine, developing policies that will balance the probable effects of carcinogenic emissions against energy and economic benefits. Other OSTP activities include a review of the present state of the knowledge of the biological effects of nonionizing electromagnetic radiation from radio frequencies and high-voltage transmission lines. Though OSTP recommended current national research needed to study the effects of this type of radiation, it did not suggest future assessment guidelines or methods.

## ANALYSIS

Much of what OSTP does partially addresses the objectives of Title III of Public Law 94-282, but we have been informed by OSTP officials that the thirteen issues identified in the legislation do not directly influence OSTP's agenda. The issues are so general to science and technology that almost any project OSTP could undertake would relate to one or more of them. On several of the issues, OSTP's work is extensive. For example, OSTP's activity in the Domestic Policy Review of Industrial Innovation, its interactions with OMB during research budget decisions, and its relationships with other Federal agencies, such as NSF, the Department of Energy, and the Environmental Protection Agency all pertain directly to the Title III mandate and appear to accomplish many of its objectives. At the same time, no systematic activity within OSTP ensures that it will examine all the issues assigned to OSTP after PCST was abolished.

Furthermore, OSTP officials we interviewed believe that the report required by legislation would not be useful. In their opinion, broad, comprehensive reports on general science and technology issues are less effective than reports and actions addressing specific, current problems.

Title III of Public Law 94-282 therefore remains unfulfilled. OSTP was assigned much of the responsibility for accomplishing that mandate, but OSTP does not believe that the law assigns it an agenda or drives any of its activity. Accordingly, OSTP has no plans to prepare a comprehensive report in response to the mandate of Title III.

## CHAPTER 4

## PLANNING THE STRATEGY FOR SCIENCE AND TECHNOLOGY

### STRATEGIC PLANNING DEFINED

Attempting to answer Senator Adlai Stevenson's second question--by describing and evaluating "the extent to which OSTP is involved in strategic planning for U.S. science and technology"--we found it helpful to define strategic planning. Many views differ about what it is and its place in a democratic, pluralistic government. Our definition is a composite from various sources.

People who wanted to provide a framework for change from present to future goals and who wanted to prepare for decision and action might plan strategically. If they did, ideally they would analyze trends, anticipate events, define goals, assess resources, and consider alternative courses of action and sequences of decisions. This dynamic process would entail continual adjustment to changing circumstances.

In national government, comprehensive strategic planning would be based on examination and refinement of national goals in the whole context of anticipated domestic and international developments, social, political, and economic. Government planners would identify long-term issues requiring many timely decisions, and they would evaluate the status of national resources and trends in programs and policies. They would diagnose problems and analyze the interactions of interdependent strategies. They would rank goals and possible actions and consider trade-offs. Finally, they would "scan the horizon" to identify emerging issues, assess risks, and develop contingency plans for emergencies.

All this is especially difficult in a complex government like ours--democratic, pluralistic, with decentralized agency missions, mixed Federal, State, and local authorities, and blurred distinctions between public and private sectors. Difficulty is compounded by conflicts that may require compromises in one or another of equally desirable national goals, as might happen if energy supply or energy conservation conflicted with environmental protection, if government regulation that constrains business retarded the innovation and productivity that stimulate economic growth, or if national security closed off international trade.

Many people believe, therefore, that comprehensive strategic planning is unrealistic in our government. Others oppose "central planning," fearing that it leads to a centrally controlled economy and infringement of life styles. Such

fears and opposition may explain why no one office or agency is specifically chartered to perform comprehensive strategic planning in the United States.

Central coordination, reconciliation, and rating of individual component strategies is now the responsibility of OMB and other units within the Executive Office of the President. Customarily, they are implemented by guidance and review, especially through the Federal budget process. Overall U.S. strategic planning, however, is dispersed among mission and regulatory agencies and other offices of limited jurisdiction within the executive branch. As a result, strategic planning tends to focus on a relatively narrow issue or broadly collect several related issues, usually within the purview of a single department or agency. It tends to be selective and fragmented. For example, one group of people might study the effective disposal of nuclear wastes. This might be broadened to an analysis of various aspects of nuclear power. A more comprehensive study, however, might consider all energy options--nuclear, coal, solar, and petroleum --while anticipating effects on the environment, international relations, transportation, communications, and basic research.

Science and technology are important to strategic planning in two ways. First, they are intrinsic to almost every policy issue imaginable. Their importance in resolving significant issues has become widely recognized. Second, as they have made more and more major and valuable contributions to society, greater attention has been given to them in their own right. Science and technology now embrace university and industrial relations for research, accountability for federally funded research, support for basic research, specialized education to assure appropriate human resources for future needs, and many other issues whose resolution strengthens the capacity of national resources for the future.

The Office of Science and Technology Policy is involved in strategic planning pertaining to science and technology in three major ways. OSTP initiates and participates in studies within primarily topical mission areas. It participates in the Federal budget process for research and development and related science and technology matters. It assists the National Science Foundation in preparing the Annual Report and the Five-Year Outlook.

## EXAMPLES OF WORK INITIATED BY OSTP

OSTP believes that writing reports is less important than engaging in day-to-day interactions. Therefore, citing OSTP studies is misleading, because they do not fully portray

OSTP's real influence. Moreover, many of its activities have long-term ramifications, and most examine quite specific topical issues. Even so, several reports initiated by OSTP illustrate a theme that we believe runs throughout OSTP's work. Each report that we cite below exhibits a strategic orientation. Each describes issues, identifies problems, considers alternative solutions, evaluates various ways of thinking about them, and recommends actions for the decisionmakers in Federal Government. These characteristics of OSTP's reports show how it engages in strategic planning. We have not assessed the technical merits of these studies, and we do not necessarily endorse their conclusions and recommendations.

The Report of the Office of Science and Technology Policy Working Group on Basic Research in DOE, published in June 1978, was commissioned by the Director of OSTP in 1977. Writers of the report had three specific tasks. They were to examine the scope and quality of basic research supported by the Department of Energy (DOE) and to compare this effort to DOE's technology programs. They were to evaluate the mechanism used to set research priorities. They were to recommend changes to improve DOE's basic research policies. DOE programs in nuclear and high-energy physics were not a part of their study.

The OSTP working group concluded that DOE did not sufficiently balance relatively short-term technology programs and basic research programs. The OSTP writers stated that "This stems in large measure from a preoccupation with certain near-term programs and neglect of longer term, fundamental work that is vital to the DOE mission."

OSTP recommended the following changes in DOE's basic research program. DOE should correct its imbalanced use of research and development performers and should increase its support of research within universities. DOE should redefine the missions of several of its laboratories. There should be a research coordinating committee to guide and control the budget for basic research in technical areas throughout DOE.

Earth Information from Space by Remote Sensing, prepared by consultants for the use of OSTP and published in June 1978, was written at the request of the Director of OSTP. He had asked them to "develop policy recommendations and options to guide decisions on United States policy with respect to civil remote sensing from space." The authors of the report accepted the proposition that U.S. policy should include a commitment to civil remote sensing from space, data continuity, and strong support of research and development efforts. They advocated one of four alternative scenarios for assessing the range of U.S. policy options for international involvement.

The writers of the report recommended that the National Aeronautics and Space Administration should be the lead agency and take responsibility for preparing a comprehensive national plan covering "the expected technical, programmatic, and institutional evolution of U.S. civil remote sensing for 10 to 15 years in the future."

"Identification, Characterization, and Control of Potential Human Carcinogens: A Framework for Federal Decision-making" was published in the Journal of the National Cancer Institute in January 1980 by an interagency panel of OSTP staff and scientists from the National Institute of Environmental Health Sciences. The writers of the article suggested a two-stage process to achieve "a * * * consistent approach for deciding what chemicals pose a carcinogenic risk to humans, for characterizing the nature and extent of that risk, and for evaluating alternative Federal (agency) actions." They recommended first evaluating various strategies for improving the reliability of scientific testing and establishing uniform procedures for laboratories that research carcinogens. They recommended also reliance on social and political judgment for assessing the regulatory process and for choosing among various regulatory options. Finally, they recommended steps by which the scientific process could augment Federal regulation.

## OSTP AND THE BUDGET PROCESS

In public statements throughout his term of office, Dr. Press has stressed the importance of OSTP involvement in the budget process. Section 204(b)(3) of Public Law 94-282 states that, as one of his primary functions, the Director shall

> "advise the President on scientific and technological considerations with regard to Federal budgets, assist the Office of Management and Budget with an annual review and analysis of funding proposed for research and development in budgets of all Federal agencies, and aid the Office of Management and Budget and the agencies throughout the budget development process * * *."

OSTP apparently views its participation in the budget as a principal means of influencing Federal research and development as well as Administration strategies and priorities. In this active involvement, OSTP influences OMB decisions less with reports than by its daily staff contact and advice.

Perhaps OSTP's major accomplishment in working with OMB is their joint fostering of the view that basic research

should be a long-term investment. To our knowledge, OSTP has advocated this with no single report but by direct contact over time. For the past two summers, the Directors of OSTP and OMB have jointly signed a letter to the agencies emphasizing that Administration policy assures effective support of basic research. They have followed up the letter with strong support for annual real growth in Federal basic research funding throughout the budget.

OSTP's assistance to OMB is particularly helpful during OMB's annual spring Director's review and during the review and detailed formulation of the budget in the fall. The OSTP staff interact with OMB examiners throughout the year, both on their own initiative and in response to OMB requests. OSTP assists OMB in many ways. It generates and reviews issues for agency budgets. It makes an objective, nonagency assessment of the technical merit of agency proposals. It evaluates agency research and development budget priorities.

Perhaps most importantly, OSTP offers a broad perspective on research and development to individual budget examiners. Most examiners see research and development only in relation to their own responsibility for specific agencies and missions. Few have time to attend hearings or become acquainted with similar programs in agencies for which they are not responsible. We were told by both OMB and OSTP personnel that, because of their broad technical knowledge, their review of agency budgets, and their attendance at most OMB budget hearings, OSTP staff are able to help budget examiners see how their responsibilities relate to programs of other agencies and to the whole range of national research and development activities.

We think there are several reasons for OSTP's apparent effectiveness in assisting OMB. OSTP is willing to work hard within the Executive Office of the President decisionmaking process. Several senior OSTP staff members have extensive knowledge and understanding of how decisions are made in the Executive Office of the President. OSTP has access to OMB at all levels. Finally, OSTP emphasizes that its job is not to advocate science and technology but to offer advice in attaining national objectives as these pertain to science and technology.

## OSTP AND PREPARATION OF THE ANNUAL REPORT AND FIVE-YEAR OUTLOOK

Public Law 94-282 requires OSTP to prepare an Annual Report in science and technology, reviewing current trends, appraising Federal programs, policies, and activities, and identifying options for solving important national problems.

The legislation also requires OSTP to prepare a Five-Year Outlook, identifying current and emerging problems that can be solved with science and technology. The two reports could be viewed as important components of strategic plans to make the best use of science and technology resources.

President Carter's Reorganization Plan Number 1, as implemented by Executive Order 12039, transferred responsibility for these reports to the Director of NSF. OSTP, however, still reviews draft documents to insure their consistency with Administration positions. OSTP also yields to the congressional desire that it continue to play a role in preparing the reports. Indeed, Dr. Press promised the Subcommittee on Science, Technology, and Space of the Senate Committee on Commerce, Science, and Transportation that he would make sure that the second Annual Report turned out better than the first.1/

OSTP takes the position that neither the Annual Report nor the Five-Year Outlook adds significantly to identifying or assessing important national problems. Furthermore, OSTP clearly believes that its time and effort should not be spent writing broad reports and that it does not have sufficient staff to write them. In the case of the Annual Report, this position stems from OSTP's conviction that no annual report contains information new to it and that OSTP's expertise and proximity to the policy process themselves identify important issues that can be resolved by science and technology. OSTP considers the Annual Report as a somewhat useful mechanism for communicating Administration actions but thinks this function is served at least as well by the Message on Science and Technology given by the President in 1979 and frequent testimony by Dr. Press.

OSTP's view of the Annual Report is echoed in its assessment of the Five-Year Outlook. Since there is little in the Outlook that OSTP considers new to it, the Outlook's identification of potentially important issues is extremely limited. Furthermore, OSTP believes that by being open to outside information, it already has a good process for identifying and assessing long-term topical problems and policy positions. OSTP does believe that the Five-Year Outlook is a valuable reference guide for people outside the executive branch and that the process of obtaining information and thinking issues through is important, however.

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1/ Oversight on OSTP: Hearings Before the Subcomm. on Science, Technology, and Space of the Senate Comm. on Commerce, Science, and Transportation, 96th Cong., 1st Sess. 104 (1979).

OSTP has given NSF help with the Annual Report in two stages of its preparation: initial planning and review of draft versions. We were given the impression, particularly for the first Annual Report and somewhat for the second, that OSTP gave NSF little guidance in the report's initial planning stages. NSF drew up its own list of issues, and OSTP staff reviewed them, according to their expertise and responsibility. Because NSF personnel were unsure of the study's posture, content, or format requirements, they seemed frustrated at this stage, but OSTP has begun to institute experimental measures to broaden communication lines between OSTP and NSF personnel who prepare the Annual Report.

OSTP was, however, actively involved in reviewing drafts of the Annual Report to make sure that they were consistent with Administration policies. Each OSTP staff member reviewed parts of the document and submitted written and oral comments and suggestions to NSF. This was the period of OSTP's most active involvement, but NSF staff members considered this process slow. They believed that more guidance in the initial stages might have made numerous revisions unnecessary.

OSTP helped NSF and the National Academy of Sciences (NAS) prepare the Five-Year Outlook in much the same way as it helped with the Annual Report. OSTP, NSF, and NAS agreed on an overall report format, but OSTP apparently offered little subsequent guidance to NSF, nor did it tell NSF which subjects to cover. NSF submitted to OSTP for review and approval both a list of areas to be covered in the Outlook and a list of issues to be addressed in the policy papers commissioned by NSF. OSTP revised these lists several times before approving them. As with the Annual Report, NSF believes that more guidance from OSTP in identifying topics would have quickened the review and might have resulted in a better report.

OSTP staff members partially rewrote sections of the Five-Year Outlook that they thought lacked in content, had improper perspective, or were out of date, according to their areas of expertise. As with the Annual Report, NSF believes that the OMB and OSTP review was poorly coordinated and too time-consuming. Several NSF staff complained that OSTP primarily advised NSF what not to say and provided little guidance on what should be said.

Most OSTP and NSF staff stress that this report writing is new to them. Both recognize that significant lack of communication hinders them. They are trying to make changes that enhance communication at all levels and stages. In particular, OSTP has explicitly stated a desire to work more

closely with the Annual Report, especially in the initial stages. Instead of assigning a single staff member to act as liaison between NSF and the rest of OSTP, for future reports OSTP has identified individuals in specific technical areas to interact with NSF throughout the entire process. Additionally, a new Office of Special Projects has been established within the Directorate for Scientific, Technological, and International Affairs of NSF. Its responsibilities include preparing the two reports. NSF and OSTP hope that this will facilitate personnel interaction.

## ANALYSIS

OSTP believes that its operating style enables it to effectively influence Administration policy. It regularly contributes significant technical expertise and advice with a strategic orientation. In our view, OSTP's influence stems from its willingness to work primarily within the existing decisionmaking framework of the Executive Office of the President, to ration its assignments of the sparse staff to areas in which they can have the most impact, to adopt issues as they are defined, and to act from its genuine conviction that science and technology resources should help the United States attain its national objectives.

OSTP staff see themselves as an active agent of change within the system. We asked Dr. Press how he will assess OSTP's effectiveness when he looks back on it 5 years from now, and he replied by listing several specific programs created or reorganized with prompting or influence from OSTP. To be effective in the existing decisionmaking system of the Executive Office of the President, OSTP believes that it must respect the norms of the system. This affects its latitude in generating new issues, redefining existing issues, and, most importantly, advocating change.

OSTP has chosen to effect incremental changes with an apparent long-term perspective, rather than conduct comprehensive or holistic studies that it believes would go unheeded. OSTP's pragmatic view is that, to be effective as a change agent, it should not waste resources by pumping out information that the decisionmakers of the existing Executive Office of the President cannot handle.

OSTP's operating style is not the only one, however. A different staff might work differently. During the last 3 years, several knowledgeable individuals outside OSTP have sporadically criticized it for not doing enough work in three major areas. Critics say that OSTP should do more "horizon-scanning" or periodic and systematic assessments of new and emerging issues in science and technology. They would also

like to see more holistic or comprehensive planning studies for bridging discrete or topically defined issues with an overall view of long-range or strategic plans for science and technology. Comprehensive studies could assess the interaction of presently defined issues and perhaps synthesize broad new strategies for anticipated issues. Finally, OSTP's critics would like to see more policies designed specifically for the science and technology enterprise.

OSTP believes, however, that all such work would require various trade-offs. The present OSTP directorate believes that OSTP's resources are stretched very thin already and that taking on additional or different activities might diminish its effectiveness.

Certain constraints also limit the degree to which strategic planning can be done. One set of such constraints is set by the characteristics of the Federal Government, another by attributes of the Executive Office of the President, and a third is set by the fact that some issues intrinsic to OSTP would have to be recognized regardless of its operating style.

Characteristics of Government that constrain strategic planning

- One constraint is the need to determine the balance between comprehensive or holistic strategic planning for all Government programs and planning for mission or topical areas.

- Strategic planners must also ask whether some policy issues are more easily adapted to Government strategic planning than others. For example, the Federal Government exercises more leadership, has access to more of the necessary information, and has more control over some issues, such as national security and space, than over other issues vested primarily in the private sector. It is undoubtedly easier to do strategic planning for areas in which the Government exerts more control.

- Finally, no matter what the issue, anyone who does strategic planning must consider the role of public participation in strategic planning.

Attributes of the Executive Office of the President that constrain strategic planning

- People who do strategic planning must balance strategic planning in the agencies with centralized

strategic planning in the Executive Office of the President.

- Another constraint is the need to determine the appropriate degree of congressional involvement in each stage of strategic planning and the extent to which plans should remain under the guard of the Administration's executive privilege.

- Strategic planning must be structured to institutionalize a process that can transcend the tenure of the President in office.

- Strategic planning must relate to the annual budget cycle.

Issues intrinsic to OSTP that constrain strategic planning

- First is the balance, and how the incumbents seek it, between OSTP's (a) contribution of technical expertise on known topical issues to the existing decisionmaking process, (b) analysis of interactions among strategies, (c) study of policy for science issues, and (d) role in identifying and redefining emerging issues.

- Second is the need for a "countervailing" challenge to OSTP that will serve as a check on or a support of its choice of issues.

# CHAPTER 5

# CONCLUSION

## SUMMARY ANALYSIS

The perceptions that the Director of OSTP has of the operating style of the President, and of the President's senior advisors, determine the objectives and activities of the science policy office in any Administration. In this Administration, top officials of OSTP believe that the broad legislative mandate for OSTP cannot be met fully under the constraints of the present Executive Office of the President. The present OSTP top management has chosen to limit its role to one that conforms with these perceived constraints.

The present officials of OSTP do not allow the staff to get bogged down in major commitments of their resources that would constrain their flexibility to respond quickly to requests from the President and, to a lesser extent, other units within the Executive Office of the President. Without exception, the OSTP staff believe that all their work must be tied to the existing Executive Office of the President policymaking process, because they have no independent control over any portion of the U.S. policymaking system. Therefore, to be effective, OSTP participates on interagency panels, attends many staff meetings at all levels in the hierarchy, and participates in the budget process with day-to-day advice and additional studies commissioned to ad hoc committees. OSTP interprets its environment as requiring it to be active--constantly initiating work and fostering the implementation of its own recommendations, many of which demonstrate an interest in influencing strategic planning in Federal policy. OSTP works primarily on topical issues that have already been defined or made apparent, however, and gives much less emphasis to exploring emerging issues or synthesizing an overview of science and technology in relation to societal issues.

We agree that the President's style of operation and the small size of OSTP inhibit OSTP from completely fulfilling the legislative mandate as revised by the Executive order. We recognize that these constraints have obligated the OSTP management to select an operating style that fits into the style of the present Administration. We believe that consideration of any change in the legislative mandate must be sensitive to choices that the Director of OSTP must make as he matches perceptions with the incumbent Administration.

We have found in answering the first part of Senator Adlai Stevenson's request that the present management of OSTP does not intend to prepare the comprehensive survey report mandated by Title III of Public Law 94-282 and transferred from PCST's responsibility to OSTP by Reorganization Plan Number 1 of 1977 as implemented by Executive Order 12039. When we questioned how it is fulfilling this mandate, OSTP responded with a list consisting predominantly of Administration actions in which OSTP played a major role. The list includes many topical studies in which OSTP participated in specific areas. We believe that transferring the Title III mandate to OSTP placed a large burden on it because the mandate significantly increased its responsibilities without increasing its resources. The mandate requires a comprehensive study, the preparation of which was intended to be the sole responsibility of an independent committee of nationally known senior individuals. OSTP's small office was made responsible for the comprehensive report; OSTP produced no comprehensive report but, instead, a list of its many activities, categorized according to the thirteen areas listed in Title III. (See appendix II.)

In answering the second part of the Senator's request, we found that the OSTP staff attempt to inject a strategic perspective into considerations of topical or mission issues in which they are involved. Examples include extensive OSTP activity in the budget process for research and development, OSTP participation in many interagency panels and committees, and OSTP's commissioning of many studies on selected issues. We found that OSTP is gradually increasing its assistance to the National Science Foundation for the preparation of the Annual Report and the Five-Year Outlook.

OSTP believes that it is not feasible to do more comprehensive strategic planning in its environment and remain effective in the Executive Office of the President. The principal reasons it gives are that the Executive Office of the President is not set up to deal with such comprehensive work, OSTP views science and technology primarily as components that contribute to the achievement of mission goals, and OSTP does not have sufficient resources. Thus, OSTP does little to study holistic interactions among discrete strategies. Additionally, OSTP gives lower priority to issues intrinsic to the governance and support of science and technology.

We found, further, that OSTP has no systematic and formal mechanism for identifying long-range emerging issues or providing a detached perspective when screening outside proposals for its agenda.

We agree that many constraints in the entire Executive Office of the President inhibit OSTP's further involvement in comprehensive strategic planning (the constraints are discussed at the end of chapter 4). We agree with OSTP that it would not be as influential as it is if it devoted most of its resources to comprehensive studies. We believe, however, that OSTP gains its influence in the policy process by providing technical expertise in mission areas but also by offering a broad perspective on science and technology as a whole. Therefore, even if OSTP cannot do comprehensive studies, its selection of issues must reflect its broad understanding of how issues relate to each other and what they may mean for the future.

We are concerned that OSTP has no systematic process for identifying, assessing, and ranking issues. We do not agree with OSTP that it is sufficient to run an open office that entertains outside suggestions for OSTP work. We believe that OSTP should establish some formal mechanism for obtaining a detached view of issues for its agenda. The mechanism should help OSTP identify emerging issues, screen the many external suggestions for OSTP work, examine interrelationships, and suggest priorities that can be subjected to the professional judgment of the OSTP staff with regard to importance, timeliness, and feasibility.

We recognize OSTP's difficulty in taking public responsibility for the Annual Report and the Five-Year Outlook. Resource constraints and the concern not to disclose the Administration's problems and strategies prematurely could cause OSTP to screen information and limit its communications to the Congress. However, the Director of OSTP is the principal spokesperson for the Administration's views on science and technology. Therefore, even though the Director of NSF has formal responsibility for preparing the Annual Report and the Five-Year Outlook, the Director of OSTP will be perceived as responsible for the report contents and posture.

OSTP is in general disagreement with our view that it has not fulfilled its broad legislative mandate. OSTP believes that its many activities and full integration into the policy process of the Executive Office of the President fulfill its mandate. While we agree that this integration fulfills a large part of OSTP's responsibilities, it has not complied with the statutory requirement that was transferred to it to produce the Science, Engineering, and Technology Survey. OSTP's comments on our draft report and our complete response to them are contained in appendix IV. (We also received comments from the National Science Foundation, and these are reprinted in appendix V with our response.)

## RECOMMENDATIONS TO THE DIRECTOR OF OSTP

We recommend that the Director of OSTP:

- prepare the comprehensive report originally mandated by Title III of Public Law 94-282 to PCST or suggest legislation for the Congress to relieve OSTP of this mandate.

- establish some formal mechanism for providing a detached view of issues for its agenda. The mechanism should help OSTP identify emerging issues, screen the many external suggestions for OSTP work, examine interrelationships among issues, and suggest priorities for consideration by OSTP.

- take greater initiative in selecting issues for the Annual Report and the Five-Year Outlook and continue to develop means for guiding NSF on the posture for treating these issues.

## ISSUES FOR CONGRESSIONAL CONSIDERATION

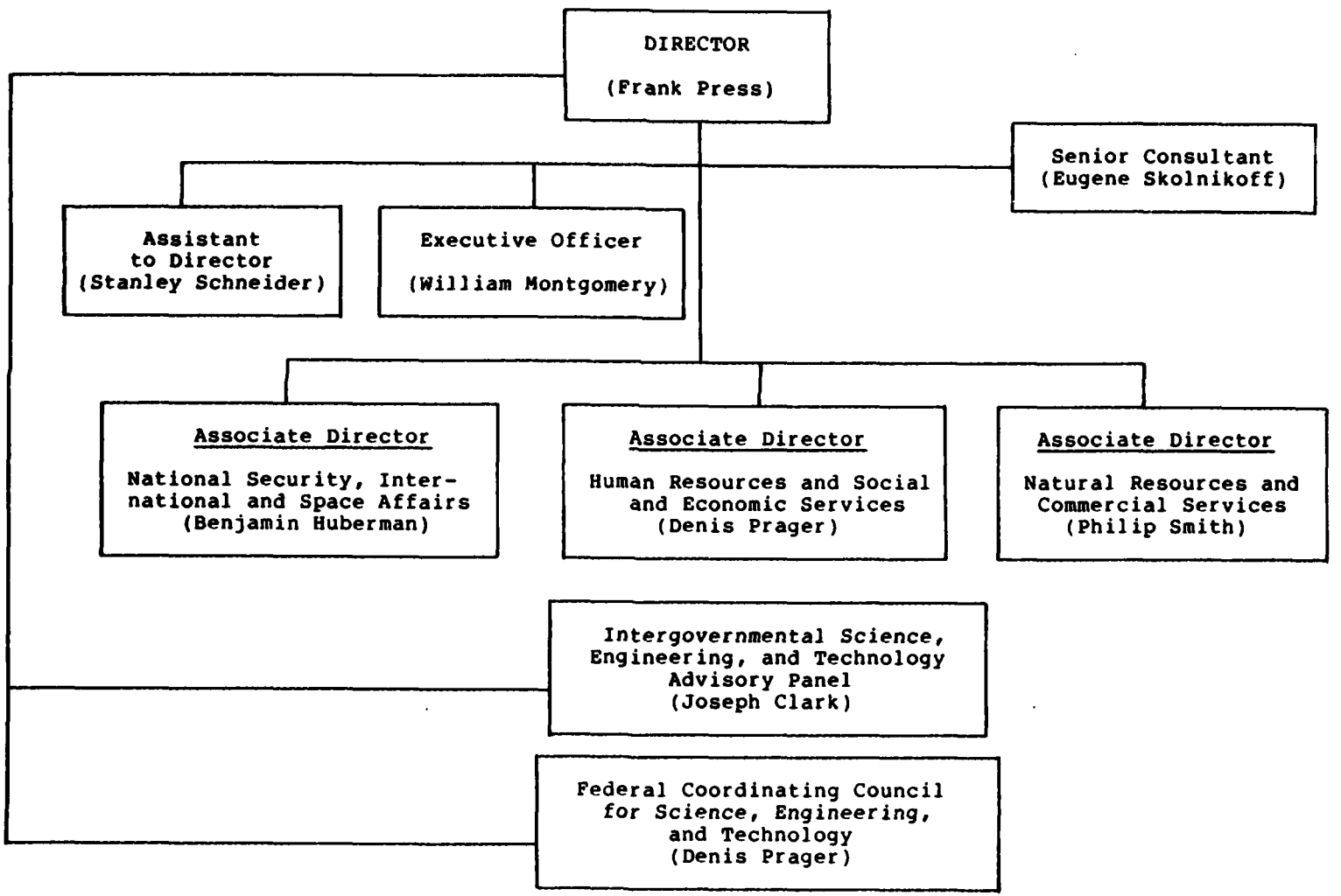
- Is a comprehensive survey of the Federal role in science and technology, as mandated by Title III, still needed? If so, what mechanisms alternative to OSTP could undertake it?

- Should some other mechanism be established to identify and rank emerging issues in science and technology? Perhaps alternative mechanisms could help the Congress critically examine OSTP's selection of items for its agenda and its analysis of issues in the Five-Year Outlook.

- Does OSTP sufficiently balance its mission-related work by giving enough attention to (1) interactions and trade-offs among topical or mission-based strategies for science and technology and (2) Federal policies designed for the governance and support of science and technology?

- How can the Congress and the OSTP Director best identify and resolve concerns about the Director's choices of operating style? Is the OSTP legislative mandate too comprehensive? What other means might fulfill congressional needs for information and analysis not provided by OSTP?

OSTP ORGANIZATIONAL CHART




Source: Supplied by OSTP May 1980



APPENDIX I

## OSTP ACTIVITIES CATEGORIZED BY THE THIRTEEN STUDY AREAS OF TITLE III OF PUBLIC LAW 94-282

Appendix II consists of text dated June 12, 1980, supplied to us by OSTP.

## REPRESENTATIVE ACTIVITIES UNDERTAKEN BY THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY THAT RELATE TO TITLE III, THE PRESIDENT'S COMMITTEE ON SCIENCE AND TECHNOLOGY, PUBLIC LAW 94-282

Public Law 94-282, the National Science and Technology Policy, Organization, and Priorities Act of 1976, provided for the establishment of a committee to conduct a survey of many issues and needs related to science and technology policy. Reorganization Plan Number 1 of 1977, which was accepted by the Congress, abolished the committee. The assessments that were suggested by Section 303, the section of Public Law 94-282 describing the survey, have subsequently been undertaken by the Office of Science and Technology Policy. In many instances, the assessments have led to specific initiatives that have been taken by Departments and agencies, or by the Administration and the Congress.

This paper briefly summarizes representative activities related to Section 303 that have been undertaken by OSTP. The activities are grouped according to the thirteen specific functions set out in Section 303(a) of Public Law 94-282.

### 1. Organizational reform

The Executive order implementing Reorganization Plan Number 1 of 1977 transferred functions of Section 303(a) concerned with reorganization to the Director of the Office of Management and Budget (OMB), subject to advice and assistance from OSTP. The staff of OSTP has nonetheless been actively involved in reorganization activities:

OSTP has assisted OMB in the preparation and analysis of formal reorganization plans. These include:

--creation of Office of Energy Research in the Department of Energy,

--transfer of some science education activities from the National Science Foundation to the new Department of Education,

--proposal for Department of Natural Resources,

--plan for the Federal Emergency Management Agency (special interim responsibility for dam safety and earthquakes),

--Nuclear Regulatory Commission reorganization.

OSTP has been actively involved in agency efforts to develop or improve scientific and technological programs. These include the study of and assistance to the Department of Defense, Department of Energy, and the Department of Transportation in improving basic research capacity, and efforts to coordinate and implement the National Climate Plan, the Earthquake Mitigation Plan, and remote sensing activities.

Pursuant to the original legislative provision, OSTP has prepared a report that addresses the issue whether scientific and technological activities should be realigned within a single Department of Science and Technology. The report assesses the advantages and disadvantages of establishing such a department, based on objectives sought in the past and in the light of current circumstances. The report, concurred in by the Office of Management and Budget is being submitted by OSTP or OMB to appropriate committees in the Congress.

2. Scientific and technological information

An ad hoc committee has been established under Federal Coordinating Council for Science, Engineering, and Technology to identify problem areas and steps that should be taken to improve the handling of scientific and technical information. The committee, chaired by an Associate Director of OSTP, has five areas on its agenda: (1) the role of central Government-sponsored clearinghouses, in particular the National Technical Information Service and the Smithsonian Science Information Exchange; (2) relations with the private sector; (3) accessibility and pricing policies; (4) the role of Federal national libraries; and (5) the status of research on information and technology.

OSTP has been concerned with the generation and application of scientific and technical information in the regulatory process. This concern is reflected in two ways. First, we have sought in the budget process to assure that adequate scientific research is supported by the regulatory agencies in order to help assure that relevant information is available on a timely basis for informed decisionmaking. Second, we have sought through our participation in Executive Office examinations of important regulations to assure

that scientific and technical information is appropriately used.

OSTP has worked in cooperation with OMB in reviewing each agency's capability to initiate, store, and process digital cartographic data. We are investigating the possibility of instituting a national data base and promulgating standards and requirements for hardware and software, so that data files can be easily communicated and used.

3. Technology assessment

The budget process has focused closely on technology assessment, particularly on the case of big development and demonstration projects. OSTP has worked closely with OMB on these evaluations. The many examples include the Clinch River Breeder Reactor, and various synthetic fuel demonstrations.

OSTP has worked with the Departments of Energy and Transportation and the Environmental Protection Agency to commission a National Academy of Sciences study on the role of the diesel engine in the future of the automotive sector. The study has two major components. One is the review of the current health-effects research programs of the Government, i.e., EPA and DOE, and of the private sector, i.e., General Motors. The second component, and the most important in this context, is a complete risk-benefit analysis that will lead to the development of policies for dealing with the diesel engine. These policies must balance the health risks associated with the (probable) carcinogenic emissions of the diesel against its energy and economic benefits.

OSTP has played a lead role in Federal efforts to assess the social and economic impacts of the development and adoption of new health-care technologies. Specifically, we are working with the appropriate Federal agencies to develop a policy of technology assessment that will encourage appropriate utilization of health technologies in both medical and cost-effectiveness terms.

Technology assessment is also an element of many other of OSTP activities. These include our current efforts to study the problems associated with carbon dioxide buildup, and our examination of both nuclear waste management, and hazardous chemical wastes. Finally, we are aware of the international dimensions of technology assessment; such assessments are an element of the tasks to be undertaken by

the Institute for Scientific and Technical Cooperation (see item 9, infra).

4. Innovation

The Administration, with substantial OSTP involvement, has sponsored a major interagency review of Federal policies to encourage industrial innovation. The review resulted in a Presidential Message to Congress on the topic and a cluster of initiatives to improve and enhance innovation. These initiatives range from new methods of sponsoring research, to reform of patent, regulatory, and information policy. OSTP believes that the Presidential initiatives are an important first step in the battle to maintain the technological strength of the American economy.

OSTP has also been centrally involved in the development of a Cooperative Automotive Research Program, a program in which the Government and the five major domestic automobile manufacturers will participate. The program will lead to increased support of basic research related to the automotive technology. The program should help improve relations between the industrial, university, and governmental sectors. The program reflects the economic and energy importance of the transportation sector, and a need for improved technology for the decade of the 1990s and beyond.

OSTP has also been actively involved in the creation of a university-industry program for ocean margin drilling. Although the focus of this program is the development of scientific information about the ocean margins, the program will include the development of advanced engineering and technology for drilling in deep water.

Aside from these formal announced initiatives that relate to innovation, OSTP has attempted to foster consideration of innovation in a number of different policy areas. These include the budget process, regulatory policy (strengthening the regulatory process, review of specific regulations impacting innovation by way of participation in the Regulatory Analysis Review Group, drug reform legislation, regulation of medical devices experimentation, and recombinant DNA technology), and economic policy.

5. Federal-State and Federal-industry liaison

The Intergovernmental Science, Engineering, and Technology Advisory Panel has focused its efforts at improving intergovernmental cooperation in science and technology. Specific ISETAP activities include:

--a process that has involved the American Association for the Advancement of Science, the State and local interest groups and others to identify State and local government problems relating to science and technology and prospective technological or research activities,

--hazardous chemical wastes,

--program for the elderly,

--technology transfer,

--LANDSAT,

--fire administration research and development.

Concern for Federal-State-local relations has also been an important element of Administration efforts in nuclear waste management, in improving nuclear safety, and in the development of space policy.

Federal-industry relations have also been the major focus of the Administration's efforts to enhance industrial innovation, to develop the Cooperative Automotive Research Program, the Ocean Margin Drilling Program, and the study of diesels (see items 3 and 4, supra).

OSTP has led a cooperative Government-industry effort to establish a national plan for the development of an aquaculture industry in the United States.

6. Federal regulation

A study of the impact of regulation on innovation was a component of the Domestic Policy Review on innovation (see item 4, supra), and general concern for rationalizing and streamlining the regulatory process has been a major and continuing objective for the Administration. OSTP was actively involved in the innovation study, and participates, with other Executive Office agencies, in the Regulatory Analysis Review Group, which examines several significant regulations each year.

OSTP also participated in the process of revision of OMB Circular No. A-21, which covers the recovery of research costs by non-profit organizations, and has been involved both in reducing paperwork and in improving accountability, as appropriate, for research activities.

OSTP has recently testified about its role in fostering improved risk characterization in the formation of rational regulatory decisions.

As mentioned earlier, OSTP has also sought to improve the science and technology base for regulation (see item 2, supra).

Concern for regulatory impacts is a part of several continuing tasks, such as our involvement in the formation of energy and transportation policy. The diesel study (see item 3, supra) is an example of concern for regulatory activities that could shape the evolution of technology.

7. Basic research

OSTP is closely involved in the budget process. During the Carter Administration, there has been substantial growth in the overall support of basic research and the development of a broader base of support. The budgets of the mission agencies in particular reflect growing awareness of the importance of basic research.

OSTP has formed advisory committees to examine basic research in the Departments of Defense and Energy. These reports were welcomed and have resulted in reorientation of agency efforts. More recently, OSTP has undertaken a similar examination of the research efforts of the Department of Transportation; the recommendations are being reviewed by the Secretary of Transportation at this time.

Several other initiatives have served to broaden the base for basic research. These include the substantial augmentation of university-industry cooperation through programs at the National Science Foundation, and through programs such as the Cooperative Automotive Research Program.

8. Strengthening academic research and education

The growth in the support of basic research in the Federal budget, and the continuing emphasis of its importance, has served to strengthen and reinforce the research activities at universities.

Several specific initiatives, such as the National Science Foundation instrumentation initiative, have been targeted on strengthening university research capability.

OSTP's continuing efforts to enhance university-industry coupling will serve to strengthen university research (see item 4, supra).

OSTP was actively involved in the reorganization plan creating the Department of Education. We worked on the transfer of certain programs from NSF, so as to assure strong and complementary programs in both the new Department and the NSF.

A study to examine scientific and engineering education is currently underway at NSF and the Department of Education at the request of the President.

9. Science and technology in national and international policies

The Director of OSTP is also the President's Science and Technology Adviser. The staff is thus closely involved in policy functions in a variety of areas. Among them:

--innovation
--productivity
--defense and national security
--energy
--health
--regulation
--emergency preparedness
--space
--environment.

In these activities, OSTP usually acts in conjunction with other parts of the Executive Office of the President. For example, as directed by the President and in coordination with National Security Council and Department of Defense, OSTP occasionally initiates detailed reviews by panels of experts outside Government to provide the President with independent analyses of key defense technology issues. This has included review, for example, of issues such as vulnerability of U.S. strategic weapons systems, and examination of the MX and cruise missile weapons development programs.

The U.S. Government engages in a wide variety of international science and technology activities with other nations, but there have been clear difficulties in the past in providing adequate policy oversight for those activities and, particularly, in developing a workable budget process that gives appropriate weight to foreign policy objectives. OSTP has taken the lead in developing and, along with OMB, authorizing an experimental procedure to provide such policy and budgetary control. This process, or a modification of it,

will be essential for effective development of science and technology relations with other nations over the long term.

OSTP initiated the planning for the Institute for Scientific and Technological Cooperation, which will provide a new capability in the U.S. Government to couple science and technology more effectively to third-world development. This initiative was a result of growing knowledge of the importance of science and technology in development, and the unrealized opportunities for improving the ability of the U.S. Government to work in this area. The President's commitment to assisting third-world countries provided the essential framework for the initiative to proceed.

Science and technology is a major element of our cooperation with China, Japan, Mexico, and other Latin American States. The scientific and technological capabilities of the United States are widely respected throughout the world and we can use respect to build new or stronger relationships abroad.

OSTP provides analysis of technical issues in ongoing arms control areas, such as efforts to negotiate a ban on antisatellite testing and in monitoring existing treaties, such as the Non-Proliferation Treaty. OSTP also participates in analysis of arms control implications of new weapons systems such as the MX ICBM; and plays the lead role in interagency analysis and management of the Comprehensive Test Ban Treaty negotiations.

Space policy. OSTP chaired an interagency effort to develop a comprehensive space policy, including the coordination of civilian and defense activities.

10. Technology for community and individual needs

There are several OSTP activities that touch specifically on these needs:

--The Intergovernmental Science, Engineering, and Technology Advisor Panel examination of the problems of the elderly;

--OSTP leadership in the area of health technology assessment;

--OSTP efforts to strengthen and increase agricultural research and extension with emphasis on the structure of American agriculture, the future of the small farm, and rural development;

--OSTP involvement in the multiagency effort on rehabilitation research and technology.

Of course, community and individual needs' issues arise in the budget process, in which OSTP is an active participant.

11. Scientific and technical manpower

On advice from OSTP, the President has recently asked the Director of NSF and the Secretary of Education to report to him on the adequacy of our scientific and engineering education. This report to the President will be completed by July 1.

OSTP has sponsored several studies by the National Academy of Sciences on women scientists in the academic, industrial, and governmental sectors.

The FY 1981 budget announces the formation of a Minority Apprenticeship Program. This OSTP-initiated project is designed to increase the flow of minority students into careers in science and engineering by establishing role models and mentors in the important high school years.

With encouragement from OSTP, NSF sponsored a study of the declining opportunities for recent Ph.D.'s in academic careers and of the resulting impact on our research capability. The President's FY 1981 budget provides funds to address this problem in specific fields.

12. Systems for planning and analysis of Federal S&T programs

OSTP concern for the effective planning and analysis of S&T programs is reflected in several activities:

--OSTP completely restructured the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET), abolishing long-standing committees that were inactive or whose mandate was outdated; establishing key committees and subcommittees in well-selected areas with cross-agency interactions; defining lead agency roles for some old topics that did not need interagency committees at this level; and elevating the FCCSET itself so that top R&D officials attend meetings themselves.

--Within specific substantive areas, OSTP has actively engaged with others in structuring and planning effective Federal programs. Examples include the

National Climate Program, the Earthquake Mitigation Plan, remote sensing, nutrition, aquaculture, and international R&D.

--OSTP participates in the OMB ZBB Process, which requires the rationalizing and coordination of S&T programs.

13. Long-range study and planning

Some of the many policy areas in which OSTP has engaged in strategic planning in S&T include:

a. Energy policy. OSTP has continuing activities to address significant strategic questions in energy policy. Within the last year, OSTP has developed an energy technology strategy for the benefit of the Executive Office of the President. We have sponsored a diesel study by the National Academy of Sciences, participated in the development of the Administration's initiatives in nuclear safety and waste management, examined the world oil situation, studied the prospects for abiogenic methane, and participated actively in the budget process on energy matters. The office has been involved in a number of matters related to nuclear energy, e.g., NRC reorganization and radioactive waste management policy.

b. Health. Our decisions to enhance basic research as an investment in the future represent a major strategy for long-term payoff, requiring sustained effort, recognition of new leads, awareness of technological opportunities and technological impacts. The proposal in the President's budget for a high and predetermined number of new and competing research awards at NIH is intended to set a steady pace for the 1980s and to avoid, as much as possible, the wide fluctuations from year to year that characterized the 1970s. OSTP has taken the lead in highlighting the opportunities to enhance health status through judicious uses of technologies, while addressing the over-utilization of many costly technologies.

c. Food and nutrition. The Administration has introduced a competitive grants program which has rewarded the most innovative individuals and groups in the land-grant colleges, as well as recruiting some additional scientists to agricultural topics. This program has focused on nitrogen fixation, genetic manipulation, environmental stresses, and certain aspects of nutrition research. All of these areas are important to the long-term application of S&T in agriculture. OSTP has worked with USDA at the personal request of Secretary Bergland to enhance the management of

agricultural research. OSTP has also been active in developing an aquaculture program.

d. Environment. OSTP has worked with EPA and several other agencies to identify high-priority research needs in toxic chemicals, acid rain, diesel engines, and many other fields. The program reviews and budget process have used these assessments. OSTP involvement has also resulted in strengthening research programs (including the creation of Environmental Research Centers at universities) and in the invigoration of the Science Advisory Board of EPA, so as to assure both the development of scientific knowledge needed in the regulatory process and its objective use. OSTP has also funded two studies of the carbon dioxide buildup in the atmosphere by the National Academy of Sciences, so as to examine and anticipate possibly significant environmental change.

e. Economic policy. OSTP has sought actively to prepare the way for a strengthened contribution of science and technology to economic growth and development. The DPR on innovation reflects in a continuing OSTP concern with the importance of science and technology as a source of economic strength.

f. International policy. OSTP has attempted to develop a coherent effort on the use of S&T to achieve foreign policy objectives. Some of the various initiatives are discussed above.

g. Space policy. OSTP chaired the interagency committee that developed the Administration's space policy. This effort resulted in the first effort to couple and harmonize the Nation's civilian and defense activities in space.

h. Defense policy. Science and technology are major contributors to the strength of the American military establishment. OSTP engages in many planning activities related to the maintenance of our military strength.

i. Regulatory policy. The OSTP, along with other offices of the Executive Office, has been involved in an examination of regulatory policy. OSTP participates in the Regulatory Analysis Review Group chaired by the Council on Wage and Price Stability, the discussions with the staff of the Regulatory Council, and in the review of specific regulatory issues. Longer-term regulatory issues, e.g., diesel automobiles in the 1980s, are also examined. OSTP has had a concern for the scientific and technical base for regulation, e.g., the carcinogen policy and the EPA university-based

centers. Generic issues have been highlighted in policy statements.

j. Manpower. On advice of OSTP, the President has recently chartered a major review of the adequacy of educational efforts in S&T. Part of this effort will include an examination of future manpower needs.

## PUBLIC REPORTS

Many of the OSTP efforts have resulted in public reports. These include:

1. Speeches by Frank Press

--"Expanding Agricultural Horizons." January 30, 1980.

--"Science and Our Future." November 1, 1979.

--"Science and Technology--The Ultimate Resources." September 28, 1979.

--"Science and Technology in a Conserving Society." August 8, 1979.

--"The Role of Science and Technology in Regulation." June 19, 1979.

--"Science, Technology and Trade." May 10, 1979.

--"Science from the Other Side of the President's Desk." April 27, 1979.

--"Technology Is for People." March 30, 1979.

--"Developing the Future Engineers America Needs--Together." September 14, 1978.

--"Science and Technology Policy for Development." September 8, 1978.

--"Perspective on R&D Policy." June 20, 1978.

--"Science and Technology in International Affairs." February 21, 1978.

--"Science and Technology--The Road Ahead." February 13, 1978.

2. Other materials

--Message to Congress on Radioactive Waste Management Program. February 1980.

--Fact Sheet on the President's Program on Radioactive Waste Management. February 12, 1980.

--Testimony by Philip M. Smith on the Ocean Margin Drilling Program. February 6, 1980.

--Fact Sheet on the Ocean Margin Drilling Program. January 26, 1980.

--Science Article on Research, Innovation, and University-Industry Linkages. January 25, 1980.

--The Quid Pro Quo. Report on Federal Support of Food and Agricultural Science, January 7, 1980.

--"Identification, Characterization, and Control of Potential Human Carcinogens: A Framework for Federal Decision-Making." Article, January 1980.

--Special Analysis K on Research and Development. January 1980.

--Report on Women Scientists in Industry and Government. January 1980.

--Fact Sheet on the President's Response to the Recommendations of the President's Commission on the Accident at Three Mile Island. December 7, 1979.

--Statement by the President on the Accident at Three Mile Island. December 7, 1979.

--Statement by Denis J. Prager before the Subcommittee on Agricultural Research and General Legislation and the Subcommittee on Merchant Marine and Tourism. November 14, 1979.

--"A Research and Development Management Approach." Report, October 31, 1979.

--Message to the Congress on Industrial Innovation. October 31, 1979.

--Fact Sheet on the President's Industrial Innovation Initiatives. October 31, 1979.

--Testimony by Frank Press before the Subcommittee on Science, Research, and Technology, Subcommittee on Natural Resources and Environment, Committee on Science and Technology. October 30, 1979.

--Report on Scientific and Technical Needs for Hazardous Waste Management. October 1979.

--"Carbon Dioxide and Climate: A Scientific Assessment." Report, July 23-27, 1979.

--Report on Federal Guidelines for Dam Safety. June 25, 1979.

--The Science and Technology Message of the President. March 1979.

--Statement of Frank Press to the Subcommittee on Science, Technology and Space, Senate Committee on Commerce, Science, and Transportation. January 25, 1979.

--Executive Summary of the American Physical Society Study Group on Solar Photovoltaic Energy Conversion. January 1979.

--"Climbing the Academic Ladder: Doctoral Women Scientists in Academe." Report, 1979.

--Report on Health Services Research. 1979.

--Science and Technology: Annual Report to the Congress. August 1978.

--Report on Improving Federal Dam Safety. July 1, 1978.

--Report of the Working Group on Basic Research in the Department of Defense. June 22, 1978.

--Report on Earth Information from Space by Remote Sensing. June 2, 1978.

--"Continental Margins: Geological and Geophysical Research Needs and Problems." Report, June 1, 1978.

--Report of the Office of Science and Technology Policy Working Group on Basic Research in the Department of Energy. June 1978.

--Article on Scientific and Technological Considerations in Water Resources Policy. June 1978.

--A Technical Review of the Biological Effects of Non-Ionizing Radiation. May 15, 1978.

--New Directions in Federally Supported Human Nutrition Research. December 1977

--Baker-Ramo Report. September 1, 1976.

3. ISETAP reports

--Scientific and Technical Needs for Hazardous Waste Management. October 1979.

--Results of the Problem Identification Process. March 1, 1979.

--Principal Findings and Recommendations on Strengthening Intergovernmental Science and Technology. January 30, 1979.

--What Can Be Done to Improve Intergovernmental Science and Technology? January 1979.

--Research Findings and Issues in the Design of an Intergovernmental Science System. January 1979.

--State and Local Government Perspectives on a Landsat Information System. June 1978.

--A Digest of Observations on Transferring Science, Technology, and Innovation in the Public Sector. May 1978.

--Initial Report on the National Science Foundation. March 20, 1978.

--Compendium of Executive Summaries of AAAS Workshops on ISETAP Priority Problems. 1978.

--First Report on the HUD Office of Policy Development and Research. December 2, 1977.

--Processes Task Force Report. March 25, 1977.

These documents supplement the Annual Report on Science and Technology and the Five-Year Outlook, both prepared by the National Science Foundation.

## GENERAL QUESTIONS COVERED BY GAO IN INTERVIEWS OF OSTP STAFF

I. OSTP's Agenda

A. How is OSTP's agenda set?

1. Is there a formal procedure for selecting assignments?

2. How do external requests affect OSTP's agenda?

B. Did the mandate in Title III for the survey of thirteen issues impact OSTP's agenda?

1. Have the efforts of PCST affected OSTP's agenda?

2. How does OSTP view the need for a comprehensive examination of the overall Federal science, engineering, and technology effort?

C. Do the Annual Report and Five-Year Outlook contribute to OSTP's agenda?

D. How does OSTP's agenda relate to strategic planning for science and technology in the United States?

1. Is strategic planning needed for science and technology in the United States?

2. Is strategic planning for science and technology feasible in the U.S. political system?

E. What constraints are imposed on OSTP that preclude setting an agenda?

1. How much flexibility does OSTP have to decline or redefine assignments?

2. How many assignments are deferred?

II. OSTP's Influence in the Federal Budget for R&D

A. How would you describe OSTP's role in the budget process?

B. To what extent does the OSTP agenda relate to R&D budget priorities?

III. OSTP's Role in the Preparation of the Annual Report and the Five-Year Outlook

What role did individual OSTP staff members play in suggesting issues and reviewing drafts of each of these reports?

## OSTP COMMENTS AND OUR RESPONSE

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON D C 20500

July 3, 1980

Dear Mr. Staats:

I am writing in response to your request for comments on the draft report, entitled The Office of Science and Technology Policy: Adaptation to a President's Style May Conflict With Congressionally Mandated Assignments.

I believe your staff has made an honest and thoughtful attempt to understand the operations of our office and of the Executive Office of the President. However, because the White House environment in which OSTP operates was very foreign to them and the interviews were necessarily limited in scope and time, some misimpressions were obviously created and are reflected in the report. I will attempt to clarify in this letter several areas in which we feel the report is wide of the mark.

First, I believe that OSTP is meeting the requirements of Public Law 94-282, the "National Science and Technology Policy, Organization and Priorities Act of 1976." The report indicates that OSTP believes that the legislative mandate cannot be met because we are constrained or limited by our presence in the Executive Office. The report suggests that OSTP officials stated an intent to ignore the requirements imposed by the law. See, e.g., i to ii, 3-7, 3-8, 5-1, 5-2. This certainly is contrary to my view and my staff cannot recall making any comments intended to convey this impression. In fact, we believe that OSTP has been effective in achieving the Congressional purpose. Of course, in order to be effective, our mode of operation must be consistent with, and complementary to the policies and operating styles of the President and those with whom we work on a day-to-day basis. We have sought to work as an essential component of the White House. But I hardly see this fact as a constraint; I believe that our efforts to be an effective participant in the policy deliberations of the Executive Office are fully consistent with and supportive of the Congressional intent.

With regard to the obligations established by Title III of P.L. 94-282 -- one title among several for which we are responsible -- we have provided in Appendix II of the report a listing of representative activities that OSTP has undertaken to address the thirteen specific items that Congress had directed the President's Committee to examine. The list is extensive because our work in fulfillment of Title III has been extensive. Moreover, OSTP has recently submitted to Congress a report on possible organizational changes concerning science and technology -- the key area of concern for the Committee -- and a description of the activities and of the many reports we have prepared to express our views to the Congress and the public on the other issues raised in Title III. (The latter items are set out here as Appendix II.) In fact, we have gone further

than report our views on these matters; we have worked to implement programs and policies which address many of the underlying issues that were raised by the Congress in the discussion surrounding the passage of P.L. 94-282 and Title III in particular.

Second, I believe that OSTP has taken a sensible course in our approach to strategic issues. The report makes a helpful distinction in separating strategic planning on "topical or mission issues" from "comprehensive strategic planning." See, e.g., 4-1 to 4-3, 5-3 to 5-4. The report finds that we have been active in the former area, but somewhat less so in the latter. However, such a distinction should not be overdrawn. It is important to make clear that our efforts on particular topics have not constrained us to examine issues along isolated agency lines or with an unduly narrow perspective. For example, our efforts to implement policies affecting innovation, regulatory reform, nuclear waste, space, and international scientific relations could hardly be subject to criticism for having too limited a focus. Thus we do not believe that our effort to focus policy development has been constraining. Rather, it has enabled us to address policy issues on a manageable basis.

Third, the draft is misleading with regard to the Annual Report and Five Year Outlook (both descibed in P.L. 94-282) and to the circumstances surrounding the abolishment of the President's Committee on Science and Technology. Pursuant to the procedures set out by Congress in Chapter 9 of Title 5 of the United States Code, the President transmitted to Congress Reorganization Plan No. 1 of 1977. This plan, as amended, transferred the responsibility for preparing the Annual Science and Technology Report and the Five-Year Outlook, to the Director of the National Science Foundation. The same Reorganization Plan abolished the President's Committee on Science and Technology and transferred its functions to the President.* The Congress consented to these changes, and Executive Order 12039 served to implement to them. The draft leaves the incorrect impression that the changes wrought by the Reorganization Plan were the consequence of unilateral executive action and were in abrogation of the will of the Congress. See, e.g., i, 2-1 to 2-2. Moreover, the draft does not acknowledge the transfer to the NSF of the responsibility for the preparation of the Annual Report and the Five-Year Outlook. See, e.g., iv, v, 2-7, 5-5.

Fourth, I must comment on the view expressed in the report that OSTP should establish a formal mechanism to provide a detailed review of issues for its agenda. To some extent, of course, our agenda is determined by events and by the interests of the President, of other parts of the Executive Office, of the Departments and agencies, and of the Congress. And with regard to agenda items that we might initiate, we continue to

*The subsequent Executive Order transferred responsibility for certain of the Committee's functions in turn to the Director of OSTP. The functions concerned with reorganization were transferred to the Director of OMB with advice and assistance to be provided by the Director of OSTP.

APPENDIX IV



make efforts to assure that we obtain the benefit of the views of outsiders to an extent perhaps not appreciated by your staff. I have consciously hesitated to establish a more formal mechanism because of the need for confidentiality at critical junctures in the policy process, and because no one group is likely to have the breadth of view to encompass the ever increasing span of science and technology. Thus I believe in a more selective process in which we consult experts with relevant expertise in the areas of concern.

Finally, I must respond to an element of the report about which I feel deeply. The report indicates that OSTP has not been concerned with issues intrinsic to science and technology. See, e.g., cover summary, viii, 5-4. On the contrary, the needs of science and technology have never been far from our minds. The efforts of our office in this area have been substantial: in assuring the support of basic research, in dealing with equipment needs, in strengthening the commitment to basic research throughout the Government, and recently, in commencing a Presidential-level examination of science and engineering education.

I appreciate the opportunity to review the draft and hope you find these remarks helpful.

Yours sincerely,

Frank Press

Frank Press
Director

Mr. Elmer Staats
Comproller General
United States General Accounting
Office
Washington, D.C. 20548

cc: Mr. Morton A. Myers
Mr. Howard Gobstein

## OUR RESPONSE TO OSTP COMMENTS

OSTP's response contains two kinds of criticism of our report: (1) it argues with our view that OSTP has not complied fully with its legislative mandate and (2) it finds relatively minor fault with a few of our specific supporting statements. We address these in order.

### OSTP's compliance with the full legislative mandate

OSTP takes exception to our view of OSTP's compliance with its legislative mandate (p. 47, pars. 2, 3). OSTP agrees with us, however, that OSTP's performance is well integrated with the processes of the President and his Executive Office. As the report plainly shows, we believe that this integration goes a long way toward fulfilling the conressional intent of Public Law 94-282, to establish an effective science advisory office within the Executive Office of the President.

We also believe, however, that OSTP has not worked well enough with the appropriate congressional committees to explain its approach to and difficulties in meeting its full legislative mandate. A clear example of this is OSTP's response to the mandate of Title III. Although OSTP has undertaken a very impressive range of activities that address the thirteen areas initially assigned for study by PCST (appendix II), it has not met part of its legislative mandate. The legislative mandate assigned to OSTP by the reorganization plan and Executive order clearly requires a comprehensive report--the Science, Engineering, and Technology Survey. OSTP has not prepared it and, in fact, has stated in 1979 appropriation hearings that a report will not be issued.1/

Our conclusions still hold; Title III clearly requires a comprehensive report. Until OSTP has prepared the report, OSTP has not met its obligation to the Congress. We believe that the Director of OSTP should either prepare this report or suggest to the Congress legislation that would relieve OSTP of its responsibility.

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1/ U.S. Department of Housing and Urban Development--Independent Agencies Appropriations for 1979: Hearings Before a Subcomm. of the House Comm. on Appropriations, 95th Cong., 2d Sess. 41 (1978).

Specific supporting statements

On the danger of overdrawing the distinction between strategic planning on topical or mission issues and comprehensive strategic planning (p. 48, par. 2), our response is that, in the report (pp. 22-23), we have noted that several knowledgeable people outside OSTP believe that OSTP should take a broader or more comprehensive view of strategic issues. We agree with these outside experts that there is a need for more comprehensive strategic planning for science and technology but, as we noted at the end of chapter 4, certain constraints inhibit broader strategic planning by OSTP.

On congressional consent to the abolition of PCST and the transfer of some of its functions to the President and others to NSF, our final report accommodates OSTP's concern that specific wording in the original draft not be misleading (see appendix IV, p. 48, par. 3, and pp. i, ii, iii, 4, 7, 26, and 27 in the report). However, in our original draft, we did not omit to acknowledge the transfer of formal responsibility for preparing the Annual Report and the Five-Year Outlook; indeed, we described it in detail, as may still be seen in the wording retained on page 20. Our attention to this responsibility was quite explicit, moreover, in that we pointed out (pp. 19-22) that, as principal spokesperson for science and technology in the Administration, the Director of OSTP not only has authority to review and alter these reports but has acknowledged this authority by promising a Senate Subcommittee that he would make sure that the second Annual Report turned out better than the first (p. 20).

On establishing a formal mechanism for reviewing issues for OSTP's agenda, OSTP's expressed concern (p. 48, par. 4), far from dissenting from our own, in reality concurs with it. In his letter, Dr. Press states even more succinctly than we have the precise reason why such a mechanism is so sorely needed: "no one group is likely to have the breadth of view to encompass the ever increasing span of science and technology" (p. 49, par. 1). If this is clearly true for the broad range of expertise from outside OSTP that it admittedly does rely on, then we believe it applies equally to the OSTP staff.

On issues intrinsic to science and technology, OSTP errs in stating that our draft report indicated that OSTP has not been concerned with them (p. 49, par. 2). Our statement on page 6 of the final report is also present verbatim in the draft. We have stated that the predominant attributes of the consistently applied philosophy of Dr. Press have been that:

"the science and technology components of national issues are studied as they relate to present Government missions or known problems or issues and

"efforts are made to see that this country invests in a strong science and technology enterprise to achieve national goals and maintain international competitiveness."

Dr. Press asserts that in OSTP "the needs of science and technology have never been far from our minds" (p. 49, par. 2). In the draft and in the final report, we consistently addressed the question most naturally raised by this assertion--How far is far?--by pointing out that OSTP believes issues intrinsic to science and technology are not unimportant but simply of lesser importance in its work than science and technology as part of agency missions.

## NSF COMMENTS AND OUR RESPONSE

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D C 20550

nsf

June 20, 1980

OFFICE OF THE DIRECTOR

Mr. Morton A. Myers
Acting Director
Program Analysis Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Myers:

I am pleased to have an opportunity to review and comment on the GAO draft report entitled The Office of Science and Technology Policy: Adaptation to a President's Style May Conflict with Congressionally Mandated Assignments.

The only parts of the draft report which directly concern the National Science Foundation deal with the preparation of the Annual Science and Technology Report and the Five-Year Outlook on science and technology (page v; and pages 4:9-14 and 5:5-6). Both reports were assigned to the Director of the National Science Foundation by the Reorganization Act #1 of 1977. If the Annual Report is to be an expression of the Administration's position on science and technology it would be appropriate that both the authority and the responsibility for its preparation be lodged in the Executive Office of the President.

I might add that in the past year, NSF has supported legislation proposed by the House Committee on Science and Technology that requires the Annual Report to be issued "from time to time as appropriate" (H.R.4490) or that repeals altogether the requirement for an annual report (H.R.7178). In addition, NSF has supported proposals that the Five-Year Outlook be changed to a four year cycle. These changes would resolve many of the difficulties associated with the preparation of these reports.

Please let me know if you require additional assistance.

Sincerely yours,

Richard C. Atkinson
Director

OUR RESPONSE TO NSF COMMENTS

We are pleased that the Director of NSF does not disagree with our views on the respective roles of OSTP and NSF in preparing the Annual Report and the Five-Year Outlook. Particularly noteworthy is his sentence: "If the Annual Report is to be an expression of the Administration's position on science and technology it would be appropriate that both the authority and the responsibility for its preparation be lodged in the Executive Office of the President" (p. 53, par. 2).

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