

The Uses and Limitations of Science Advisors

The Need for Science Advice

Although the vast majority of government scientific advisors are concerned with relatively small decisions (such as the choice of materials to be used in military equipment) or with the technical review of grant requests from their fellow scientists, we focus in this book on the roles played by high-level science advisors in major policy decisions: whether to proceed with the SST development program, whether to ban most uses of cyclamates or DDT, whether to deploy the Safeguard antiballistic missile system. For such decisions the primary service which the advisors provide is not information—the decision maker usually has plenty of that supplied by his own technical staff and that of government contractors. The advisors' major contributions are analytical and critical.¹

BYPASSING CHANNELS

An occupational disease of bureaucracy is self-deception. Power can be concentrated at the top of bureaucratic hierarchies; but information cannot be concentrated, only filtered. By the time it reaches the officials in charge, information generated within a bureaucracy will ordinarily pass through the hands of several lower-ranking bureaucrats each of whom has the power to delete but few of whom have anything worthwhile to add. Doctoring of reports to alter their conclusions is not unheard of.² Even with the best of intentions, a large bureaucracy intellectually insulates its higher officials. The people on top may have the authority to make choices, but the options from which they choose and the information on which they base their choice are prepared by their subordinates.

After a bureaucracy has been in existence for a few years, it will have made certain decisions, established certain operating procedures, and solidified certain

relationships with other powerful institutions. All of these arrangements constrain the options and the information available within the bureaucracy. Thus are born bureaucratic procedures and bureaucratic truth.

Leading government officials are usually eventually forced to respond to nonbureaucratic perceptions of reality—by the newspapers, by Congress, or by the courts. But an astute leader will want to know in advance the likely responses to his actions, and he will not wish to be overly constrained by bureaucratic precedent. In order to obtain a candid response on these matters, he must obviously turn to people whose own positions are sufficiently secure and independent that they will not be much influenced by the reception their advice is accorded. Hence the need for outside advisors. This need is particularly acute in highly technical areas, where government officials often cannot entirely trust their own judgment and where the outside advisors may have a considerably broader expertise than regular government employees.

Besides helping to prevent the government from cutting itself off from reality, the science advisory system has sometimes also acted as an excellent conduit for new ideas and information—both within the government and between the government and the scientific community. This has been made possible partly because of the way science advising was organized and partly because of the nature of the scientists themselves. Committees advising different government departments on similar subjects are frequently intimately interconnected by overlapping memberships. The inner circle of the science advisory community—the few hundred scientists who are on everyone's list of the "right names"—see each other in numerous other capacities in their professional activities and as representatives of their universities or corporations. These scientists are in touch with developments in their parts of the scientific community and typically serve simultaneously at several levels in the advisory establishment. They are thus able to cultivate a flourishing grapevine, whose narrower runners are the telephone lines and whose main branches are the transcontinental jet routes—and whose roots are nourished by the larger scientific community. Good scientists know that they must always be open for new ideas, and they have learned from repeated experience that the important new ideas often arise outside the "establishment." As a result, the science advisory grapevine—and the larger, informal communications network of science of which it forms a part—can provide pathways for a rapid flow of ideas and information from the scientific community or from the lowest levels of the government directly to the highest officials, bypassing the slow and selective bureaucratic filter.

IDENTIFYING THE CHOICES

Perhaps the most difficult part of governmental decision making—just as in scientific research—is the recognition of the important problems. Since scientists are more familiar with the technical facts than are government officials, they are

often the first to perceive such problems. For example, the 1960 NASA report quoted in Chapter 2 (see page 14) pointed out the importance of minimizing takeoff and landing noise in the design of the SST engines. Unfortunately this advice had been forgotten by the time the choice of SST engines had to be made. This example illustrates another moral: the need for continuous technical review of important programs. One of the most serious deficiencies in the system of ad hoc advisory panels and committees is that while committees come and go, the problems remain.

CONSIDERING POLICY IMPLICATIONS

Should science advisors answer only purely technical questions and seek merely to identify but not address issues requiring political choice? In practice, it has been found impossible to make such a clean separation between the functions of science advisor and policy maker. At the higher levels of government, science advisors have been repeatedly called upon to help make policy as well as render technical judgments.

One reason why the roles of advisor and decision maker cannot be clearly separated is that decisions on questions like the safety of a new drug or the environmental impact of the SST are never in practice based on adequate information. The various benefits and costs are usually largely a matter of guesswork. And postponing a decision until better information becomes available in itself constitutes a decision. Obviously, only a person familiar with the technical information is in a good position to estimate the risks arising from uncertainty. And an advisor who understands the technical issues may also be helpful in judging how heavily to weigh these issues against other, nontechnical considerations.

Because public officials must often rely upon the combined political and scientific judgment of their technical advisors, they tend to choose as advisors scientists whose political views are similar to their own. Presidential science advisors were routinely selected on this basis. But while shared assumptions may improve communication, they may also effectively result in political views determining technological policies without sufficient regard for technical considerations. In some cases balance has been achieved within the executive branch when opposing factions have established their own advisory groups, each having different political biases.³ Thus, the President's Science Advisory Committee shared the interests of Presidents Eisenhower and Kennedy in a nuclear test-ban treaty and helped them stand up to the prophecies of doom which arose from Pentagon and Atomic Energy Commission experts whenever the prospects of negotiation with the Soviet Union appeared to brighten. The impossibility of avoiding some political bias in advisory groups is of course an additional reason why Congress and the executive branch should each have their own advisors—even if executive-branch advisory reports were to be made freely available.

A Success Story

An example of the operations of the science advisory system at its best will make some of the abstract discussion of the last several pages more concrete. It should also serve to counterbalance the more disillusioning stories that occupy the next four chapters. The example concerns a President's Science Advisory Committee (PSAC) report on the long-term hazards of pesticides.⁴

BACKGROUND

The insect-killing properties of dichloro-diphenyl-trichloroethane (DDT) were discovered in 1939 by the Swiss chemist Paul Müller. In the following years the chemical was found to kill an almost incredible number of insect and even rodent pests—ranging from malaria-bearing mosquitos, through the cotton bollworm and the spruce-budworm, to rats and bats. Public enthusiasm for the new chemical was almost unbounded, and in 1948 Müller was rewarded by a Nobel Prize for his discovery.

The popularity of DDT unleashed within the chemical industry a great search for other synthetic organic pesticides. By the mid-1960s many hundreds were being sold in the United States in tens of thousands of preparations with annual retail sales amounting to more than a billion dollars. This enormous market had been created with substantial help from the U.S. Department of Agriculture (USDA), which was by statute responsible for the promotion of agriculture as well as the regulation of pesticide use so as to protect the public health. (The Environmental Protection Agency was given the authority to regulate pesticide use in 1970.) County agricultural extension agents, who had substantially worked themselves out of a job as they successfully fostered the modernization of American agriculture, had joined the chemical company salesmen in efforts to convince farmers to make massive and almost exclusive use of synthetic pesticides against all sorts of real and sometimes imaginary pest threats to their crops. Local governments and individual homeowners followed suit by using pesticides in great quantities to kill mosquitos, elm bark beetles, roadside brush, and innumerable other unwanted infestations.

In 1962 Rachel Carson, a biologist and writer of popular nature books, published *Silent Spring*.⁵ The book presented dramatically and with painstaking documentation the basis for her concern about the impact of pesticide usage on the environment and on human health. From *Silent Spring*, the public learned a particularly surprising and frightening fact: after DDT is widely dispersed in a spraying program, its chemical properties result in its being absorbed out of the environment into the bodies of animals and returned to man in astonishing quantities in the milk, eggs, meat, and fish he eats.⁶

The fact that DDT migrates in the air and water and lasts for years without significant decomposition (and hence is labeled "persistent") have made it one of the few truly long-lived and global pollutants. Thus it was clear to Miss Carson that, if exposure to DDT was found one day to be a serious hazard to human

health, it might very well be too late to do anything about it. When *Silent Spring* was published, the typical American already had about a gram of DDT stored in his fat.

Although it was unclear what the long-term human consequences of this exposure would be, by 1962 it already appeared to be disastrous for a number of other animal species. In particular, there were then indications that a number of birds of prey and sea birds were becoming extinct because DDT was making it impossible for them to reproduce successfully. On a local level, of course, it had become a common occurrence for a bird population to be virtually wiped out by the immediate toxic effects of DDT after the spraying of an area, with the fish in the streams, lakes, and offshore waters of the watershed often suffering the same fate. Because of the pervasiveness and persistence of DDT, it quickly became the focus of the national debate triggered by *Silent Spring*.

THE RESPONSE OF THE SCIENTIFIC ESTABLISHMENT TO *SILENT SPRING*

Silent Spring was greeted by agricultural and chemical industry spokesmen with a storm of opprobrium: "misinformed," "distorted," "hoax," and "fanatic" were typical characterizations.⁷ The reviews of *Silent Spring* read most widely in the scientific community were also less than enthusiastic. In *Chemical and Engineering News* (October 1, 1962), the news magazine of the American Chemical Society, the review by William Darby, member and past chairman of the Food Protection Committee of the National Academy of Sciences' National Research Council (NAS-NRC), was entitled "Silence Miss Carson." In *Science*, the journal of the American Association for the Advancement of Science, I. L. Baldwin was slightly more moderate: he suggested that Miss Carson lacked perspective, dismissing her concerns about possible long-term public health hazards by stating that "most scientists who are familiar with the field, including government workers charged with the responsibility of safeguarding the public health, feel that the danger of damage is slight."⁸ He did not, however, explain how this "feeling" could be substantiated in the absence of tests of pesticide chemicals for carcinogenicity (potential for inducing cancer), mutagenicity (potential for inducing genetic defects), or teratogenicity (potential for causing birth defects)—tests that had been urged in *Silent Spring*. Baldwin went on to stress his view that the benefits obtained from man's use of pesticides far outweighed the costs.

Finally, for a "careful and judicial review of all the evidence available"⁹ Baldwin referred to reports of a "committee of outstanding scientists", established by the National Academy of Sciences' National Research Council (NAS-NRC) to study the influence of pesticides on human health (Darby's committee), and a companion committee (chaired by Baldwin himself) which had been established to deal with pesticides and wildlife. Any readers who troubled to obtain copies of the reports Baldwin cited must have been disappointed. The reports are brief, superficial, and undocumented. For example, the report of Baldwin's committee devotes only two pages to the subject of "Wildlife Losses due to Pest Control in Agriculture" although an

The Uses and Limitations of Science Advisors

estimated 3 billion pounds of pesticidal preparations were being used in agriculture annually. Not only is the discussion quite cursory, but it seems also to avoid the more serious questions relating to pesticide use, such as the problem of persistent pesticides such as DDT being concentrated in food chains and the role in the worldwide decline—possibly even extinction—of certain species of birds. In general one gathers from the report that avoidable damage to wildlife should be minimized, but that when the choice is between unavoidable damage to wildlife—no matter how great—and the cancellation or reduction of a pest control program, the wildlife must go. Baldwin's committee had functioned under the ground rule that nothing appear in any of the reports that did not have unanimous approval within the subcommittee concerned.¹⁰ This rule, in combination with the fact that a number of the committee members had close ties with the Department of Agriculture and pesticide manufacturers and were convinced pesticide enthusiasts, goes far in explaining the apparent evasiveness of the reports.

THE 1963 PSAC REPORT ON PESTICIDES

Silent Spring first appeared as a series of articles in *The New Yorker* in June 1962. Richard Garwin, then serving his first four-year term on the President's Science Advisory Committee (PSAC), was greatly impressed by Rachel Carson's arguments. At the next monthly meeting of PSAC, he distributed copies of her *New Yorker* articles and vigorously urged that PSAC conduct an independent investigation. Such a study was initiated several months later by Presidential science advisor (and PSAC chairman) Jerome Wiesner, after President Kennedy expressed concern about pesticides.¹¹

Following the usual PSAC custom, also common on other science advisory committees of broad scope, Wiesner appointed an ad hoc panel—the Panel on the Use of Pesticides—which was commissioned to prepare a report to be submitted to the President after review by the full committee. The panel included three members of PSAC, four members from university faculties, the director of the Connecticut Agricultural Experiment Station, and a conservationist from the Audubon Society.¹² They met several times during an eight-month period to deliberate and to be briefed by experts on pesticides. The people from the Department of Agriculture regarded pesticide use as an all-or-nothing proposition, according to one member of the panel,¹³ and they refused to discuss the individual merits or drawbacks of specific pesticides. Chemical company scientists in their turn emphasized the safety of their pesticides and the high costs of pesticide development. Rachel Carson was also called as a consultant. During a session lasting nearly a day, she impressed the panel members as being much more moderate and sensible than the more dramatic passages of her book had led them to expect.¹⁴

The panel soon reached a consensus that differed rather sharply from the prevailing opinions on pesticides in government and industry. They recognized that even "safe" pesticides have serious potential costs that must always be weighed against their benefits. Continued exposure to small amounts of

persistent pesticides like DDT and eldrin can be harmful over long periods of time to wildlife and perhaps also to man. Chronic toxicity and the potential for causing cancer, genetic damage, or birth defects are much more difficult to detect than acute poisoning, but no less serious. The panel concluded that studies of such chronic effects in laboratory animals were urgently needed.

The panel was also critical of the prodigal use of pesticides in government efforts at total eradication by chemical means of particular insect species like the gypsy moth or fire ant. They argued that "acceptance of a philosophy of control rather than eradication . . . acknowledges the realities of biology" and pointedly urged that "Federal programs should be models of correct practice."¹⁵ These comments may have been prompted by an event that occurred during the PSAC panel's deliberations. One panel member recalls a "long hot session" where Agriculture Department spokesmen discussed their plans to spray Norfolk, Virginia, with the persistent pesticide dieldrin, a chemical considerably more toxic than its cousin DDT, in an attempt to eradicate the white fringed beetle. Despite the panel's vigorous objections, the spraying was carried out on schedule.

President Kennedy reportedly often asked about the progress of the PSAC Pesticide Panel and urged speed in getting out the report.¹⁶ He evidently liked the report when he finally received it, for when he released it to the public on May 15, 1963, he noted that he had "already requested the responsible agencies to implement [its] recommendations."¹⁷ The report recommended, among other things, that "the accretion of residues in the environment be controlled by orderly reduction in the use of persistent pesticides. . . . Elimination of the use of persistent toxic pesticides should be the goal."¹⁸ The report concluded with a quiet tribute to Miss Carson:

Public literature and the experiences of Panel members indicate that, until the publication of "Silent Spring" by Rachel Carson, people were generally unaware of the toxicity of pesticides.¹⁹

The PSAC report was greeted by the press as a powerful vindication of *Silent Spring*. The reaction to the report in the scientific community was more cautious but no less significant. Although scientific controversy over various issues raised by Miss Carson certainly did not cease, the level of the discussion was raised from denunciation and personal vilification to reasoned argument. It may be grandiloquent to claim that PSAC acted as a high court of science on the pesticides issue, but the importance of PSAC's leadership in this case is undeniable.

More generally, the PSAC pesticide report, together with the broader-scope PSAC report *Restoring the Quality of Our Environment*, written two years later, can be credited with initiating a shift in the federal government's policy on pesticide use away from the massive insect-eradication programs of the Plant Pest Control Division of the Agriculture Department in the 1950s and early 1960s. Another decade of effort was required by organizations like the Environmental Defense Fund—a combination public-interest law firm and

scientist-activist group—before commercial misuse of persistent pesticides was curtailed. (These developments are traced further in Chapter 10. And Chapter 6 is concerned with the herbicide 2,4,5-T, whose ability to induce birth defects was detected in laboratory tests undertaken following the recommendations of the PSAC pesticide report.)

The PSAC pesticide report thus accomplished several useful functions. It gave the President sound advice on pesticide policy—advice that he was not receiving from the Department of Agriculture or other regular government channels; it played a leading role in helping the scientific community come to grips with the problems of persistent pesticides; and it served to reduce the resistance within the government against further useful steps.

PERSPECTIVES

The executive-branch science advisory system deserves great credit for achievements like the PSAC pesticide report. But it must be kept in mind that, as the report itself admits, it was Rachel Carson who first brought the dangers of pesticides to general attention. If *Silent Spring* had not inspired a high-level review of pesticide hazards, the government would probably have continued to rely on such uncritical advice as that of the NAS-NRC committees chaired by Baldwin and Darby. The advisory system rarely develops significant new issues, responding instead to the initiatives of others. As a distinguished National Academy of Sciences panel noted somewhat ruefully:

When Presidential Task Forces, private foundations, or groups like the President's Office of Science and Technology or the President's Science Advisory Committee become involved, . . . the usual reason is that a specific area of concern has already reached near-crisis proportions or has otherwise captured the imagination of particularly articulate individuals (Ralph Nader and Rachel Carson come immediately to mind) or of unusually influential groups. The result is often a report that duplicates other efforts, or overlooks important considerations, or comes too late to exert any significant influence on the underlying technology, or is without a recipient other than the public at large.²⁰

Advisory committees cannot entirely escape the diseases of the government bureaucracies to which they are attached. Because the government officials being advised often do not have adequate time to understand the issues involved in technological disputes, there is strong pressure on advisory committee members to compromise their differences and present a united front. "On the whole the greatest occupational hazard of advisory committees is not conflict but platitudinous consensus," according to Harvey Brooks.²¹ Henry Kissinger, while still a Harvard professor, expressed the limitations of advisory committees even more forcefully:

The ideal "committee man" does not make his associates uncomfortable. He does not operate with ideas too far outside of what is generally accepted. . . .

Committees are consumers and sometimes sterilizers of ideas, rarely creators of them.²²

It seems that no amount of improvement in the official science advisory system can obviate the need for the participation of independent scientists in democratic policy making for technology.

Political Uses of Advisors

In the first place, the high prestige of the National Academy of Sciences gives its recommendations an intrinsic merit of their own. It helps to have them behind you. . . . [I] used them to protect myself against other bureaucrats and politicians. For instance, with their backing I could appear more confidently at congressional hearings or before the public and not be fearful of having some politician or scientist claim the Commerce Department was all wrong because we hadn't consulted the right people.²³

—Myron Tribus,
former Assistant Secretary
of Commerce for Science
and Technology

We come finally to the subject of the next several chapters: the political uses of science advisors. It is evident from the PSAC pesticide report that science advisors can contribute usefully to the government policy-making process. However, science advisory committees have been popular with government officials for other reasons as well. Bureaucrats are constantly involved in struggles to expand and defend their empires. This is a dangerous business, and what bureaucrats perhaps most desire from their science advisors is protection: protection against surprise by new technological developments and protection of their policies against political attack.

Technological surprise can take the form of an unforeseen technological development or an overlooked argument that a political opponent can pull out of the hat and turn to his own advantage. Unlike law, diplomacy, economics, or other traditional pursuits of public policy, science and technology are subject to radical new departures. And even if these departures surprise most scientists, they are at least the first to know.

If a government official deals with technology, he had better have scientific advisors who keep him informed of any new technical developments that may affect his position. In the aftermath of the shock of *Sputnik*, with its surprising revelation of Soviet technological prowess, President Eisenhower showed that he had learned the importance of this function by creating the position of Presidential science advisor and reconstituting PSAC, formerly an advisory committee to the Office of Defense Mobilization, as his personal science advisory committee.

The second essential function of science advisors, from the point of view of insecure government bureaucrats, is to act as high priests whose ministrations

during the preparation of a policy are supposed to render that policy immune from political attack. A common strategy is exemplified by William Magruder's invocation of "the considered opinion of the scientific authorities" in support of his assertion that the SST would be environmentally harmless. When this ploy eventually failed, Magruder reverted to another standard device: the appointment of new and more cooperative committees of experts to study the problem.

The next chapters will give more examples to illustrate the ways that the science advisory apparatus has been used as an excuse to delay decision or action, to backstop an official or provide him with a justification for reversing policy, and generally to legitimize government actions and intimidate Congress and the public.

NOTES

1. A sympathetic but accurate portrait of the science advisory system has been given by Harvey Brooks in his essay "The Scientific Advisor," in *Scientists and National Policy-Making*, Robert Gilpin and Christopher Wright ed. (New York: Columbia University Press, 1964), pp. 73-96; reprinted in Thomas E. Cronin and Sanford D. Greenberg, eds. *The Presidential Advisory System* (New York: Harper & Row, 1969), pp. 40-57. Other essays in these volumes are also useful, and the standard literature on the science advisory system can be traced from their references. For a detailed discussion of the history and organization of the higher levels of the executive-branch science advisory system, see Frank von Hippel and Joel Primack, *The Politics of Technology: Activities and Responsibilities of Scientists in the Direction of Technology* (Stanford, Calif.: Stanford Workshops on Political and Social Issues, Stanford University, 1970) and references therein. See also U.S. Congress, House, Committee on Government Operations, *The Office of Science and Technology*, 90th Cong., 1st sess., March 1967.

2. Such was the fate of a report by Dr. Marvin Legator, chief of cell biology research at the Food and Drug Administration, to the FDA commissioner. See James S. Turner, *The Chemical Feast* (New York: Grossman Publishers, 1970), pp. 13-14. See also Chapter 7, below.

3. Anne H. Cahn showed in *Eggheads and Warheads: Scientists and the ABM* (Cambridge: Center for International Studies, MIT, 1971) that, with very few exceptions, the only Presidential science advisors on antiballistic missiles who supported ABM deployment were those who also served as Defense Department science advisors, and the only members of Pentagon science advisory panels who opposed the ABM were those who simultaneously served as Presidential advisors. Cahn furthermore showed that, if ABM advisors and activists were divided into pro- and anti-ABM groups, the groups differed strikingly in general political world-view. Policy and politics are hard to separate!

4. In his 1963 testimony before the Senate Appropriations Committee in support of continued funding for the Office of Science and Technology (through which PSAC was funded), Presidential Science Advisor Jerome Wiesner singled out the report discussed here—the PSAC report *The Use of Pesticides*—as exemplifying the way his office carried out its responsibilities. [U.S. Congress, Senate, Committee on Appropriations, *Independent Offices Appropriations for 1964*, Part 1, 88th Cong., 1st sess., 1963, p. 527.] Most PSAC reports dealt with military matters and are still secret.

5. Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin Co., 1962); also available in paperback (New York: Fawcett World); first published in part in *The New Yorker*, June 16, 23, 30, 1962.

6. Because DDT has a very low solubility in water and a relatively high solubility in fat, it tends to concentrate in the fatty tissues of animals and in animal products with high fat content. The concentration in some fish and fish-eating birds, for example, has often been found to be many thousand times that in the body of water which supplied them their food. Other pesticides in the family of chlorinated hydrocarbons have the same property.

7. Quoted in Frank Graham, Jr., *Since Silent Spring* (New York: Fawcett World, 1970), p. 83.

8. I. L. Baldwin, *Science* 137 (1962): 1042.

9. *Ibid.*

10. Graham, *Since Silent Spring*, p. 52.

11. The pesticides inquiry was begun by a panel of federal officials but the responsibility was then shifted, apparently as a result of President Kennedy's concern, to PSAC. See Graham, *Since Silent Spring*, p. 61, and *Chemical and Engineering News*, May 27, 1963, p. 102.

12. *Ibid.*

13. The panel member quoted was William H. Drury, Jr., director of the Hatheway School of Conservation, Massachusetts Audubon Society. Quoted by Graham, *Since Silent Spring*, p. 83.

14. Interview with panel member Paul M. Doty.

15. U.S., President's Science Advisory Committee, *Use of Pesticides* (Washington, D.C.: The White House, May 15, 1963), pp. 18-19. Reprinted as "Report on the Use of Pesticides," *Chemical and Engineering News*, May 27, 1963, pp. 102-115.

16. Graham, *Since Silent Spring*, p. 83.

17. *Use of Pesticides*, p. iii.

18. *Ibid.*, p. 20.

19. *Ibid.*, p. 23.

20. U.S. Congress, House, Committee on Science and Astronautics, *Technology: Processes of Assessment and Choice* (Washington, D.C.: Government Printing Office, July 1969), p. 28. This report was prepared under the auspices of the NAS Committee on Science and Public Policy (COSPUP). Both COSPUP and the Technology Assessment panel were chaired by Harvey Brooks, Dean of Engineering and Applied Physics at Harvard. Brooks has been a consistently influential science advisor for many years.

21. "The Scientific Advisor," in *The Presidential Advisory System*, p. 52.

22. Henry A. Kissinger, *The Necessity of Choice* (New York: Harper and Row, 1961). The quotations are taken from the final chapter, entitled "The Policymaker and the Intellectual," p. 345.

23. Quoted in Claude E. Barfield, "National Academy of Sciences Tackles Sensitive Policy Questions," *National Journal*, January 30, 1971, p. 101.

Not the Whole Truth: The Advisory Reports on the Supersonic Transport

One of the ways in which administration officials often mislead the public about the basis for their decisions is by releasing primarily (or exclusively) the information and analyses which support the administration position. The information so provided may be accurate, but it often is also totally misleading as to the true balance of costs and benefits. The long debate over the SST development project provides a number of examples of the selective release of information. Comprehensive advisory reports on the project's benefits and disadvantages were suppressed while the media were supplied with other reports which gave a misleading impression that certain objections which had been raised to the SST were not so serious after all.

The Comprehensive Reviews

In our discussion of the SST program in Chapter 2, we noted that immediately after taking office, President Nixon commissioned two high-level, comprehensive reviews of the SST program. One review committee was made up of senior officials from the relevant government departments and agencies, along with a representative of NASA, a member of the Council of Economic Advisors, and the President's science advisor. This committee reported to the President through the Secretary of Transportation, whose Department had primary responsibility for the project. Its charge was to consider whether continued federal funding of the SST development program was in the national interest.