The Making of a Science Adviser

After a late start and some prickly relations with the scientific community, George Keyworth has established a niche in the White House

When he was plucked 18 months ago from the relative obscurity of the Los Alamos National Laboratory to become President Reagan's science adviser, George A. (Jay) Keyworth II was not expected to make much of an impact on policy. A newcomer in the world of Washington politics, his power base is a small, middle-tier office in the White House hierarchy. His appointment, moreover, came 5 months into the Reagan presidency—after many key budgetary decisions affecting science and technology had already been made—and he faced the task of integrating himself into a power structure that was already firmly established.

If that were not enough, Keyworth encountered unease, verging on hostility, from parts of the scientific community. He was an outsider whose candidacy had not been sponsored by scientists active on the science advisory circuits in previous administrations. Indeed, few of them had even heard of him. Worse, his chief backer was Edward Teller, the nuclear physicist who has never quite been forgiven by much of the scientific establishment for his role in the Oppenheimer affair.

Yet, in spite of these early handicaps, Keyworth has made himself a force to be reckoned with. According to observers in the Administration and others who have been following Keyworth closely from the outside, he has carved out a sizable role for himself and the office he heads, the Office of Science and Technology Policy (OSTP).

The Reagan Administration has developed a discernible science policy, and Keyworth has emerged, if not as its principal architect, at least as its most forceful exponent. The policy (see box) derives from the Administration's conservative economic and political agenda. It emphasizes support for military over civilian technologies; reduces the government's direct role in development projects, especially in many energy areas; and attempts to assist private industry through a variety of tax and regulatory reforms. And, in a period when virtually every item of government expenditure other than defense is under severe budgetary pressure, spending on basic research has been relatively protected.

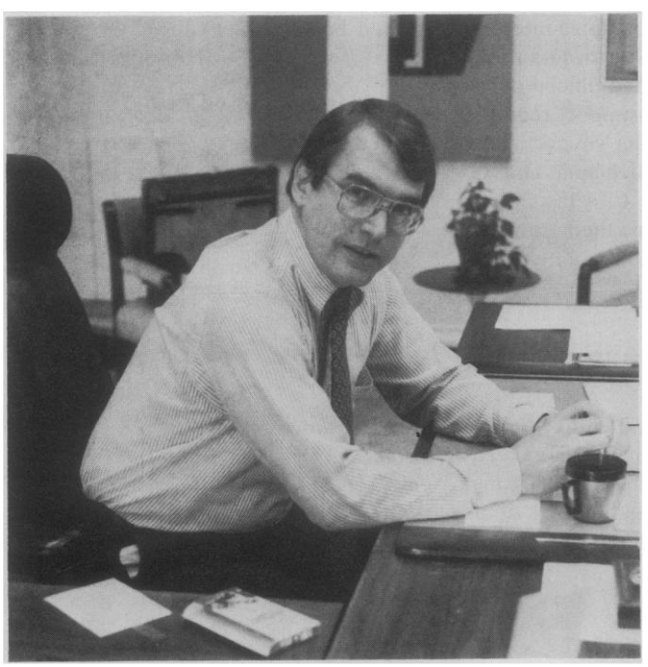
One measure of Keyworth's status is the size of his staff, and in this respect, he appears to be doing well. Although the budget for OSTP provides for only about 12 people, four times that number now work in the office. This expansion has been achieved by bringing in people on detail from other government agencies, which continue to pay their salaries. He also appears to have established good connections with other elements of the White House.

"I am impressed by his degree of access, both to the President and his senior advisers," says one White House official. "He has somehow managed to avoid the problems that many of us ran into," says Edward E. David, Jr., President Nixon's science adviser, who is now president of Exxon Research and Engineering. "He may be more effective than anyone has been since Wiesner and Kistiakowsky," David adds. (Jerome Wiesner was science adviser to President Kennedy, and George Kistiakowsky served in that post under President Eisenhower.)

Keyworth's status and style of operation are, however, very different from those of Wiesner and Kistiakowsky. They were very senior advisers who developed close personal relationships with the presidents they served, briefing them frequently and directly on a broad range of issues. Keyworth, in contrast, works mostly through Reagan's senior advisers, especially Edwin Meese III, counselor to the President and the chief architect of Administration policy, and David Stockman, director of the Office of Management and Budget (OMB). Although he has met with Reagan several times on issues concerned with science and technology, he is clearly not one of the president's closest advisers.

His contacts with Reagan tend to be mostly in formal settings, such as Cabinet Council meetings, or as one of a team of advisers. He also attends, along with Meese and Stockman, relevant budget sessions at which agency or department heads appeal decisions directly to Reagan.

However, this does not mean he cannot get in to see Reagan when he feels he has a pressing need to get the President's attention. Although he declines to discuss specific instances, other White House aides say that Keyworth went directly to Reagan with concerns he had about plans to put the MX missile in hardened minuteman silos, and in Au-



George Keyworth

An unusually outspoken adviser whose blunt message has not always endeared him to the scientific establishment.

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gust he arranged and attended a meeting between Teller and Reagan in which Teller recommended a crash program to develop space-based x-ray laser weapons.

Keyworth's influence derives from his working relationships with Meese and the other senior advisers. On several occasions, he has described himself as a "team player." He is ideologically committed to the Reagan Administration's goals of reducing the government role in the economy and in social programs and beefing up the military. And he has made it clear, often bluntly, that he is not the scientific community's spokesman in the White House, sometimes publicly supporting policies that have been sharply criticized within the community.

This has won Keyworth the respect of Reagan's inner core of advisers, according to several observers. Keyworth himself said in a recent interview with *Science* that OSTP's integration into the White House advisory structure "is the least of our problems," and he said that he is so closely in harmony with the Administration's budget policies that, "believe it or not, I don't have any area where I have had conflict with OMB."

By casting himself clearly as a team player, Keyworth has avoided one of the chief problems to beset some past science advisers, who were perceived as representing the interests of the scientific community rather than as supporters of Administration policy. That seemed to be the case during Nixon's presidency, when the President's Science Advisory Committee (PSAC), which Edward David chaired, publicly argued against some prominent Administration programs, notably the antiballistic missile system and the effort to build a supersonic passenger aircraft. As a result, Nixon abolished the White House science advisory apparatus in 1973, and scientists were left out of the inner corridors of power until 1976, when Congress approved a bill to establish OSTP.

Such problems will not recur under Keyworth. Not only is he highly supportive of the Administration's politics, but he has also appointed an advisory committee, the White House Science Council, that is unlikely to repeat PSAC's heresies. Its members are predominantly conservative, business is well represented (6 of 13 members), and it contains some prominent "hawks" such as Teller and former Los Alamos director Harold Agnew. The narrow makeup of the panel has drawn some criticism, but Keyworth says he "paid it no attention." In general, he says, "it is of little value to the Administration, at least in policy advisory positions, to have people who do not share the Administration's views."

While Keyworth has successfully been establishing his credentials in the White House, his relations with the scientific community have gone through some rough patches. The initial unease with which his appointment was greeted was not erased when, in early interviews and speeches, Keyworth began expounding some unpalatable truths. Science, he noted, could not expect to escape from the fiscal constraints being imposed throughout the government. Scientists, he warned, had better start making some painful decisions about which areas of research should be pruned in order to provide growth in areas ripe for expansion, suggesting that there is plenty of fat in research budgets because in the past, "throwing money at problems . . . has

Reagan's Science Policy

The Reagan Administration has made some decisive changes in the direction of federal science and technology policy. To a large extent, they stem from the Administration's conservative economic and military policies, and they were well under way before George Keyworth was appointed President Reagan's science adviser. Keyworth, however, has become one of the most forceful proponents of the new directions. The chief elements are:

A boost for the military. After a long period in which defense R & D has accounted for a declining share of the federal science budget, military programs are receiving a massive infusion of cash. Reagan's budget proposals would boost spending on defense R & D from $17.1 billion in fiscal year (FY) 1981 to $24.7 billion in FY 1983—an increase of 45 percent, or about 25 percent in constant dollars. Most of this increase would be in development programs, but basic research in the Department of Defense is also slated for a major increase, from $563 million to $768 million over the same period.

A redefinition of federal responsibilities. The Administration has pulled back from many development projects and cancelled a variety of innovation programs begun during the Carter Administration. The philosophy is that the federal government should concentrate on basic research and defense R & D, and leave commercial technological development to the private sector. The most severely affected programs are those designed to develop nonnuclear energy sources and promote energy conservation. The Administration, for example, has sharply reduced support for synfuels projects and virtually eliminated funding for many renewable energy and conservation programs. These changes account for the bulk of the decline in support for nondefense R & D, which is set to drop by about 16 percent in constant dollars between FY 1982 and FY 1983.

Support for basic research. Funds for basic research have held up relatively well, compared with other items in the federal budget. Support is set to increase by about 15 percent between FY 1981 and FY 1983, which translates into a cost-of-living increase. Funding for the physical sciences and engineering would increase slightly faster than inflation under the Administration's proposals, while that for biological sciences would rise a little more slowly.

Cuts in social sciences and education. A major exception to the pattern of research support is social science. In a move that appeared to be ideologically motivated, the Administration went through the FY 1982 budget with a fine-tooth comb and slashed funds for social research. Congress, however, restored many of the cuts, and the Administration's FY 1983 budget was a little more generous than the previous year's. Similarly, the Administration sought to eliminate the National Science Foundation's science education programs, but Congress again restored some of the funds. According to Keyworth, the FY 1984 budget proposal will contain some new Administration proposals for education programs in the foundation.

Incentives for business R & D. Although the Administration has shut off direct support for several commercial technology programs, it is trying to help stimulate private sector R & D through tax incentives, regulatory changes, and reform of the patent laws.—**C.N.**

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often been responsible for furthering mediocrity." On one occasion he accused scientists of "arrogance" for believing that they should be spared from the budget ax.

Perhaps the low point came in the fall of 1981. In September, 6 months after sending an austere budget to Congress, Reagan announced that a further 12 percent cut would be needed in order to hold down the federal deficit. Only defense and a few other priority areas would be spared. Frank Press, Keyworth's predecessor as head of OSTP and science adviser to President Carter, convened a "summit meeting" of some 100 leading scientists to discuss the impending budget cuts. The meeting took place at the National Academy of Sciences, the bastion of the scientific establishment, where Press had recently been installed as president. Keyworth was invited to attend and, according to associates, was considerably irked by the hostility he encountered from some participants and by the apparent general unwillingness to face up to the need for fiscal restraint. (As it turned out, basic research escaped with relatively minor cuts, well below the 12 percent target.)

Keyworth was further irritated by criticism of the Reagan Administration's fiscal year 1983 budget, which was released last February. Although basic research was slated for a cost-of-living increase at a time when virtually everything else was being slashed, there were lots of grumbles about cuts in some programs. This drove Keyworth to deliver himself of some "pent up reactions" in a blunt speech to the AAAS science policy colloquium last June. Like a scientist who refuses to abandon a cherished theory even after it has been proven wrong by experimental findings, he said, "the science community has been sticking to its bogeyman theory . . . that the Reagan Administration was out to cut science budgets for ideological reasons." He went on to say that, all too often, "pork-barrel thinking" can be discerned in the scientific community.

At that same meeting, Press took the initiative in trying to heal the rift between Keyworth and the scientific establishment. He praised Keyworth for fighting for and achieving real growth in support for many areas of basic research and commended him for having "the courage to tackle these very difficult and politically dangerous issues of evaluation, reorganization, and reallocation in order to put money into the best scientific institutions." Press's olive branch has brought at least one tangible result: a few days after the colloquium, Keyworth asked Press for the Academy's advice on which areas of research should be given budget priority. With uncharacteristic alacrity, the Academy established seven task forces, and Keyworth was briefed on their recommendations in late October and early November.*

There are also signs that Keyworth's abrasive warnings of continued fiscal austerity are beginning to spark a broader debate. "There are an awful lot more people talking about the need to develop priorities than there were a year and a half ago," says Philip Smith, executive officer of the National Academy of Sciences and a former assistant director of OSTP. But Keyworth is not yet impressed. "I don't really see substantial action at this point," he says.

R & D budgets will remain tight, and priorities must be set, Keyworth warns.

As with any presidential adviser, it is not easy to detect Keyworth's personal stamp on Administration policy. This is especially true in the area of national security, which, Keyworth estimates, accounts for about half his time. But OSTP has become involved in a broad range of issues at the request of other White House offices, which at least indicates that its advice is valued, and it has launched some initiatives of its own that could eventually influence policy.

OSTP's influence is often measured by how well science and technology fare in the Administration's budget proposals. Reagan's first budget, which set out some fundamental changes of direction in areas including science and technology, was sent to Congress 2 months before Keyworth was appointed, however. In general, that budget began the shift of resources into defense; held support for basic research roughly constant; and attempted to slash spending on nonnuclear energy programs, the social sciences, science education, and environmental R & D. With the exception of funding for some areas of social science research, where OSTP worked behind the scenes to get some money put back in, the same trends were evident in Reagan's second budget.

"Keyworth had been going around saying we should emphasize innovative areas [of R & D] and reduce support for the dead wood. I looked for these trends, but didn't find them," says one congressional critic. Keyworth sees it differently. He points to cuts in some energy programs and increases in support for basic research as evidence of discrimination and claims credit for securing relatively large boosts for high energy physics and space science, two areas he says are ripe for an injection of new funds. Last year's budget "did only a small fraction of the total job" of reordering priorities, Keyworth says, adding "I think you will see many more thrusts in the 1984 budget."

Keyworth and OSTP have also been devoting a lot of attention to the national laboratories. At his confirmation hearings last year, he promised a thorough review of policy for the labs, but nothing much happened until last spring, when a panel of the White House Science Council was given the assignment. Early indications are that the panel will be generally supportive of the labs and will not suggest radical reforms. Keyworth, however, says he would like to see the labs concentrate more on basic research and become more closely linked with industry and the universities. "Five years from now, they will look very different," he predicts.

OSTP has also been involved in reviews of space policy and agricultural research, recommending, in the former case, more attention to shuttle-based science and less to grand programs such as construction of a space station. In the latter case, OSTP urged a shake-up of the agricultural research system to emphasize basic research.

There have, however, been important areas in which OSTP has been involved only peripherally, if at all. Keyworth has played little role in the debate about restricting some areas of scientific communication because of national security. That issue has been confined chiefly to the Pentagon, and "Keyworth has no authority relative to these matters," according to one participant. OSTP is, however, now examining ways to implement the recent National Academy of Sciences report on the matter.

The picture that emerges almost half way through the Reagan Administration's first term is of a science policy apparatus that is closely linked to other elements in the White House and in some cases is subordinate to them. Keyworth, after a late and rocky start, has emerged as an important team player, and as a result, is gradually gaining influence.—**COLIN NORMAN**

*The task forces are looking at agriculture, astronomy and astrophysics, mathematics, atmospheric sciences, materials science, neurosciences, and human health effects from hazardous exposures.