WHILE SCIENCE ADVICE POURS IN, BUSH DAWDLES ON SCIENCE ADVISER

Ever since Franklin Roosevelt's immediate flurry of activity in his first term, Presidents have often been judged by their first 100 days. On his 49th day, President Bush appeared before the White House press corps to deny accusations that his Administration suffers from "drift" and "malaise." To dignify the first seven weeks, he identified his accomplishments, ranging from the proposed bailout of troubled savings-and-loans to his determination to reduce high levels of acid rain. "We're on track," he claimed, and his popularity outside Washington, as measured by approval ratings between 59% and 71% in the public opinion polls, suggested that the nation felt the same. All things considered, though, the first two months have left a blurred outline of the Bush Administration's science program.

Bush seemed to make his intentions clear about R&D during the last two weeks of his election campaign, in a speech before the Ohio Association of Broadcasters. In it, he expressed his commitment to government investment in basic research and in science and mathematics education from elementary grades through graduate school. In the same address Bush said he would seek to make permanent the business R&D tax credit that will otherwise expire at the end of 1989. He also pledged to upgrade the President's science adviser—a particularly sore point with many scientists who contend that the position fell in regard and responsibility during the Reagan Presidency.

WESTINGHOUSE PHOTO

Honoring young scientists, President Bush speaks before the 40 finalists in the Westinghouse Science Talent Search, gathered at the National Academy of Sciences. Flanking Bush (from left): Academy president Frank Press, Westinghouse chairman John C. Marous and Berkeley physical chemist Glenn T. Seaborg.

Space, 'our destiny'

In his budget message to a joint session of Congress on 9 February, Bush pleased even his scientific critics when he announced as the first specific item his resolve to double the National Science Foundation's budget by 1993. Second on his list was the R&D tax credit. He then declared that the space program should always be "full throttle up." That, he said, is "not just our ambition, it's our destiny." He spoke of these as elements to "extend American leadership in technology, increase long-term investment, improve our educational system and boost productivity . . . the keys to building a better future."

On 3 March, in a speech honoring the 40 young winners of this year's Westinghouse Science Talent Search, Bush repeated his commitments to NSF, NASA and science and mathematics education. "Scientific knowledge must be renewed and expanded in each generation," he said. "Many of the miracles that we take for granted in everyday life originated in defense and space research. . . . For our country to maintain its technological and scientific excellence, no investment in machines or laboratories, as vital as that may be, will, by itself, be sufficient. There have to be people who have the knowledge and the commitment. And that will be men and women like yourselves," he told the prize winners, "who will lead America into the next century."

From the vantage point of scientists and educators, the new President is saying all the right things. But beyond the message there is little to indicate that much is happening. There is as yet no sign that the advice so profusely given to him by scientists during the campaign and transition periods has been taken. Of course, it was never certain the advice was wanted at all.

One of the earliest pieces of advice was sent to Bush, then Vice President, on 26 May 1988 by Val L. Fitch (Princeton), at the time president of The American Physical Society. Fitch conveyed a resolution passed by the APS Council four months earlier, calling for "a prestigious and influential science advisory office to address the opportunities that science and technology offer for the 1990s." This message was followed on 25 August

by a letter signed by the leaders of 23 science and engineering societies, representing a total of 750 000 members, once again urging the appointment of a White House science adviser early on "so that this individual could help select other officials responsible for dealing with science and technology issues at the highest levels of government."

Two weeks later, on 7 September, the nongovernmental Council of Competitiveness, headed by John A. Young, president and chief executive officer of Hewlett-Packard, complained that the Federal government's current procedures for setting science and technology priorities and coordinating policies across agencies "are insufficient." It urged the next President to elevate his science adviser to assistant to the president, with Cabinet status and Oval Office access equal to the National Security Adviser. It also proposed that the adviser, as director of the White House Office of Science and Technology Policy, ought to have a sufficient budget and qualified staff to function the way Young's group of business and academic leaders would prefer (PHYSICS TODAY, October 1988, page 70).

Once the election was over, the nation's scientific and engineering establishment began flooding Bush's transition team with advice that the new President might find irresistible. This ranged from an exhortation by the council of the National Academy of Engineering to "foster incentives for increasing the number of US students enrolled in graduate technological and scientific studies" as a way of improving US industrial performance in global markets to the appeal by Worldwatch Institute to "waste no time" in taking the lead in dealing with global environmental problems.

Four 'white papers'

All the advice was unsolicited. Among the most cogent was a quartet of "white papers" sent by the nation's highest scientific and engineering echelons on 5 January, just two weeks before Bush's inauguration. The papers, bearing the imprimatur of the National Academies of Sciences and Engineering and the associated Institute of Medicine, provide recommendations on four issues that are likely to require decisions in the first year of the Bush Administration. The topics are science and technology advice in the White House, space programs, global environment and AIDS policy.

At a news conference, Frank Press, president of the National Academy of Sciences, called the four papers "unprecedented" as a way of reaching an incoming Administration that vows to emphasize science and technology. "It's a sign of the times." Another apparent sign is that Press, Robert M. White, president of the Academy of Engineering, and Samuel Thier, president of the Institute of Medicine, briefed Richard Darman, Bush's budget director, on the issues and their monetary implications for the government's R&D budget.

Not surprisingly, the white paper on Presidential science advice contains neither more nor less than previous recommendations on the subject from the academies and other organizations, including a report by the Carnegie Commission on Science, Technology and Government. The 22-member commission, under the cochairmanship of Joshua Lederberg, president of The Rockefeller University, and William T. Golden, president of the New York Academy of Sciences, issued its report on 1 February—too late for a pre-inaugural choice of science adviser but in plenty of time, as it turns out, to impress the President that he faces a "substantial increase in the number and scope of issues whose resolution requires scientific and technical knowledge and informed professional judgment."

Few people in Washington are really surprised that President Bush has not yet named his science adviser. While the Senate processed most of his Cabinet nominations quickly, it spent weeks in rancorous debate over Bush's choice of former Senator John Tower to be Defense Secretary and finally voted to oppose him. White House sources say Bush is seeking someone with industrial research experience for the job of science adviser and is in no hurry to fill the post. By mid-March only two people had actually been interviewed with any intensity—though a score of scientists and engineers have been considered and some of these were talked to. Then there are the jobs of NASA administrator and the heads of other agencies such as NOAA and the National Institute of Standards and Technology (formerly the National Bureau of Standards) to be filled.

Bush has been criticized for filling these key posts so slowly. Both Presidents Carter and Reagan needed convincing before they agreed to appoint their science adviser. Carter took six weeks before naming Frank Press, and it was April before the Senate confirmed the nomination. Reagan's first science adviser, George Keyworth II, came on board four months after Inauguration Day. In Bush's case, say White House insiders, the delay is caused by the increasingly intrusive clearance process imposed by the FBI and the Congress.

Another reason for dawdling, some observers suggest, centers on the White House chief of staff, John H. Sununu, a former three-term governor of New Hampshire who possesses a DSc in mechanical engineering from MIT and boasts an IQ of 170. Technically knowledgeable but personally abrasive, Sununu has turned off a few candidates for jobs at OSTP, NASA and other agencies. "We have a unique situation here," Simon Ramo, a founder of TRW and a frequent government adviser, was quoted as saying. "The combination of Bush and Sununu is apt to put science and technology high on the agenda for the first time in any Administration. So I'm not surprised everyone wants their attention."

The most specific advice that Bush has gotten came in the academies' paper on space policy. While the new President must build a consensus about the nation's future in space, NASA needs better leaders, less bureaucracy in its field offices and more exciting goals, says the paper written by a committee led by H. Guyford Stever, President Ford's science adviser and a former NSF director. Right now, complains the Stever committee, the nation's space program is confused and overcommitted, as well as encumbered by inconsistent direction and funding. The space station is cited as an example. Although the committee allows that the station will need to be permanently inhabited to establish the feasibility of human exploration, its final configuration, deployment schedule and funding level should be reassessed once the country's purpose in space is clearly known.

NASA's 'big ticket'

This conclusion challenges Bush's campaign promise last October to begin operating the station by 1996. By emphasizing the exploration of the solar system, the committee also contradicts NASA's goal of using the station as a platform for microgravity research and materials manufacturing. The awful truth, says the Stever paper, is that NASA "has not provided a strong political or scientific foundation for the program." That statement alarms some members of Congress, since the station is a "big-ticket" item in a period of budgetary restraint. Both the Reagan and Bush budgets ask Congress to appropriate $2.1 billion to begin construction of the station in fiscal 1990. The estimated total cost of the project runs

between $23 billion and $30 billion.

The Stever committee believes that NASA's base program ought to cost about $10 billion per year to cover top priorities, including a well-balanced portfolio of space science and Earth observational programs. In addition, NASA should get $3 billion to $4 billion each year for special initiatives, such as a space station, a moon base, a Mars odyssey, a multisatellite observational network known as "Mission to Planet Earth" and a major solar system exploration. Increasingly, says the committee, NASA is finding it hard to find and keep talented scientists and technicians. NASA should consider liberating its field staff from civil service limits by "privatizing" its centers the way the Department of Energy operates its laboratories—through universities and industrial companies. The only center run that way now is the Jet Propulsion Laboratory, managed by Caltech.

If the space program doesn't give Bush a headache, the problems raised by the global environment are almost certain to require Excedrin. "We believe that global environmental change may well be the most pressing international issue of the next century," declares a paper prepared by an ad hoc committee under Cornelius J. Pings, provost of the University of Southern California. In a letter accompanying the paper, the President is told "the problem of environmental change is now widely recognized as one of growing urgency that will require responses by your Administration. Embedded in the diverse manifestations of this problem—global warming, ozone depletion, tropical deforestation and acid deposition—are enormous challenges to science and engineering, to your Administration and to the world community of nations." Although the "full long-term implications of alterations to the Earth's environment by human actions are still uncertain," says the Pings paper, "there is a growing perception that the future welfare of human society is to an unknown degree at risk." The paper urges the new President to adopt measures to slow the inexorable changes through prudent policies. These would include reducing the burning of coal and oil, increasing the use of such "clean" fossil fuels as natural gas and developing energy sources that do not produce carbon dioxide, such as geothermal, wind, solar and the modular high-temperature gas reactor, the so-called safe nuclear reactor (PHYSICS TODAY, September, page 47). The paper also calls for even deeper cuts in the production of chlorofluorocarbons than those agreed to by 31 nations in the 1987 Montreal Protocol, which requires that world consumption of CFCs be reduced by 50% by 1999.

A 'long-distance race'

Possibly the most highly placed advice came from the Committee to Advise the President on High Temperature Superconductivity. This panel, appointed in 1987 by President Reagan, who referred to them as the "wise men," is made up of distinguished scientists and industrialists and headed by Ralph E. Gomory, IBM's senior vice president for science and technology. Its report, which had languished at OSTP for three months before its release on 3 January, recommends setting up several consortiums of research universities, commercial companies and government laboratories to develop high-T_c superconductors. The purpose of such cooperative groups is to keep R&D at a consistent level for the decade or more that it will take before the new technology pays off. The trouble now is, as the Gomory Report says, "While there is a high level of activity in US industry today, much of it is scattered . . . and unlikely to survive in what we believe will be a long-distance race."

The panel proposes four to six superconducting consortiums, funded by its industrial members; the government would pay the tab of the universities and national labs. The panel estimates the annual cost of the program might come to $25 million to $30 million more than current Federal outlays for all high-temperature superconductivity, which was about $96 million in 1988. The commission also recommends that the National Science Foundation allocate an extra few million dollars per year on principal investigator grants for superconductivity researchers—a sore point among scientists in the field who have complained about the dearth of NSF funding the past two years.

Notwithstanding all the R&D problems the experts call on Bush to deal with, perhaps the biggest he faces is whether he can deliver on the great expectations he has promised for science and science education in the next four years. In the meantime, the science community is exhilarated by Bush's rhetoric on the issues.

—IRWIN GOODWIN

UNIVERSITIES REACH INTO PORK BARREL WITH HELP FROM FRIENDS IN CONGRESS

The 100th Congress adjourned at the end of October after passing all 13 appropriations bills—something that hasn't happened for nearly a decade. It also managed to attach scores of special "earmarks" to those bills for projects at universities and colleges—something that's been done so frequently in recent years that the practice is ridiculed by critics who use the term "academic pork." Though pork projects once were almost entirely restricted to highways, harbors, post offices and military bases, in more recent years academic institutions have acquired classrooms, laboratories and hospitals with a little help from their friends in Congress.

In the fiscal decade through 1989, a new study shows, more than $900 million has been set aside in Federal appropriations for some 300 academic buildings and research projects. These data were compiled by James Savage, principal Federal relations analyst at the University of California System in Berkeley. His report, released on 7 March, calls academic pork "perhaps the most divisive issue in higher education."

The habit of reaching into the pork barrel has increased in recent years, as the cost of new facilities has risen and contributions from donors have become harder to raise. The pile of pork for academic projects in this year's budget totals about $290 million, according to a compilation done by *The Chronicle of Higher Education* in February. This is just short of the $291 million in the fiscal 1988 budget—a sum *The Chronicle* considers a record for special-interest projects on US campuses.

Congressional purveyors of academic pork proclaim it is necessary to counter the tendency of the scientific and medical communities to play the "old boy" game. Competitive merit review by professional peers, the argument runs, is unfairly biased toward the favored and famous universities. The agencies that are charged with providing the money have little