If I Were the Science Adviser: Some Luminaries Have Their Say

National Science Foundation director H. Guyford Stever has been nominated as the President's science adviser, ending a couple of months of nonsuspense about the choice. Senate confirmation hearings were scheduled for 28 July, so if all goes as planned Stever will be safely installed in the Executive Office Building by the time the Republican convention starts on 11 August.

Stever's selection was announced just as *Science* was completing a survey to find out what various people would do if they were the President's science adviser. The survey included plausible candidates for the post, such as William Baker of Bell Laboratories, as well as people who, while unlikely to be picked for the job, might be expected to have interesting ideas about it. Many of those approached declined to imagine themselves in the position, preferring to discuss the job on an impersonal basis. Here are their views on what the President's science adviser should do.

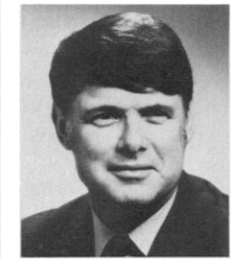
Stever

Commoner

Baker

Roszak

Ray



Murray

• **Barry Commoner**, ecologist: Commoner's first act on becoming science adviser would be to "resign. I don't believe in science advice. The decisions that are based on science information are political questions that require political judgments and value judgments. It is much more important that the information be delivered, not have scientists whisper in the king's ear. . . . Pressure from an informed public is far better than an advisory system, the SST being the prime example." The test ban treaty was an example where the science adviser (Jerome Wiesner) influenced the President, but it was the public that turned Congress around on the issue. "The big problem is that the agencies (such as ERDA) haven't developed an adequate procedure for developing state of the art information that could be delivered to the politicos." If there must be a science adviser, he says, his role should be strictly an educational one—"I worry about a system of advice which ends up with the elite making the political decisions. . . . It's time to break away from the whole rigid pattern that says science is so great and objective." Also, "I hope that my colleagues don't assume automatically that the thing for Carter to do if elected is to give us back what we had under Kennedy. We need fresh air throughout the whole system."

• **William O. Baker**, physical chemist: Baker says he has been offered the job many times but prefers his present role, which he sees as bridging the federal and independent domains of science. He believes the post "has been highly useful in all its forms" and that "things would be very different without any science advisers. . . . We would have big government suffocating [science] and a bureaucracy estranged from the roots of research and discovery." Future issues, he thinks, "cluster around the notion that the President will have to deal with economic stresses which were not the principal issues of the 1950's and 1960's." Science and technology will more than ever be harnessed to the service of compelling domestic political issues, such as housing, urban problems, taxes, transportation, food production, and nutrition.

• **Alvin Weinberg**, Institute for Energy Analysis: "It depends on who the President is. In a Carter Administration . . . the President would have an exceptionally strong scientific background. The main issue needing clarification is the role of science and technology versus the OMB [Office of Management and Budget]. The first issue would be energy. Also technology assessment—the acceptability of new techniques."

• **Jeremy Stone**, Federation of American Scientists: If pressed to imagine himself as science adviser, "I would surround myself with scientists who care, I would try to raise the scientific consciousness of the government and the social consciousness of the scientific community. And I would learn all I could about peanuts." Stone adds, "most things the President can understand fairly well. In science policy he really needs people he can trust—a sort of scientific brain lobe to read and assess all those documents and give him dispassionate appraisals."

• **Lester Brown**, agricultural expert and world watcher: "I would be inclined to look at it in a global context. I would undertake a major study to try to identify with some accuracy what the needs are. One of the things I would look at would be the basic question of new directions, with a careful examination of the Schumacher policy—small is beautiful [English economist E. F. Schumacher is the proponent of intermediate technology]. The SST, for example, and the way the technology was sold—largely by economists," with no regard to human considerations. "We need to rethink our basic life-styles. The system eliminates exercise from our daily lives and we have to devise ways to get it back in," for example, fashioning an environment conducive to biking to work. "There are other important problems such as population. If a male chooses to take responsibility for contraception he has to use a method developed two centuries ago! This is a sad commentary on contraceptive technology." And on health: "Cancer is important, but looking around the world, far more important in epidemiological terms is schistosomiasis." Domestically, "we can't make important gains in improving health through the doctors and drugs route. Those things accessible to us are probably much more on the behavioral level." Also, "We need a basic overhaul, restructuring, and reorientation of

the research establishment. We need to look around, establish what the pressing needs are—solar technology is one, the development of a solar cooking device to offset the world firewood crisis." Brown acknowledged it was hard to imagine Ed David or Guy Stever talking up solar cookers, but "things may change. We can't divorce anything from the needs of the rest of the world."

• **B. F. Skinner**, psychologist, author of *Beyond Freedom and Dignity*: "I would like to see someone who took more interest in the behavioral sciences . . . to see the President more familiar with what is available on human behavior. The kind of behavior modification in education, counseling, and industry has never crept into government very far. The decision-makers think of historical analogies or think what they would do in a situation—we need modern analysis of human behavior brought to problems. . . . Decision-makers don't look at all the consequences." The raising of gas prices, for example—"that saves some gas but what about all the people who are resentful about those who can drive?"

• **Amitai Etzioni**, sociologist, director of the Center for Policy Research, Inc.: "My number one priority would be for the President to set up an 'Earth NASA' dedicated to developing the programs needed to deal with domestic problems. It would involve putting together about 100 programs in the federal bureaucracy, such as RANN [Research Applied to National Needs], experimental programs at the National Bureau of Standards, the National Institute on Education—each one dealing with one leg of the elephant—big, visible, and powerful enough to R & D our domestic problems."

• **Garrett Hardin**, human ecologist and propounder of the "tragedy of the commons": "He should have the sort of relationship with the President that Vannevar Bush had with Roosevelt—be around the White House and be available in an informal way. He would have to be a person the President had such confidence in that he could sit in on anything. . . . The important thing is to sort of lean against the President, cause him to shade his decisions some." The science advisers of the past frequently have "failed to do very much good. We need one to whom the President can say, 'Hey, Joe, what about this?' "

• **Margaret Mead**, anthropologist: "I do not see a social scientist as science adviser. I see a natural scientist, preferably a biologist, who can relate to both the social and physical sciences. The biologist should preferably be an ecologist,

Stever Gets Delayed Nod

H. Guyford Stever seems headed for prompt confirmation as President's science adviser, but the timing of the announcement that the nomination was being sent to the Senate came as something of a surprise. A White House hold on the Stever nomination since mid-June had encouraged assumptions that it was politically sensitive and might not appear, at least until after the Republican convention.

Ford's nomination of Stever had been strongly rumored in June, but four conservative Republican senators had objected to Stever because of National Science Foundation (NSF) management of science curriculum programs (*Science*, 2 July). Ford's political advisers had reportedly urged him to avoid actions which could offend conservatives who might desert him in his neck-and-neck race with Ronald Reagan for the GOP presidential nomination.

If this was the case, why did the White House send the nomination forward when the contest for delegates was at fever pitch? The White House, characteristically, has no comment on the timing of the nomination. (The nomination itself was made with a minimum of the fanfare which often attends appointments of this sort. It was done through a "posting," which involved an announcement limited to the bare essentials.) Stever himself is keeping tactfully mum on the subject. Some observers on Capitol Hill, however, find the timing inexplicable and, according to their political lights, are interpreting it as a product of either political courage or inept staff work.

Others speculated that the President apparently decided to go ahead because the move to restore the science adviser to the White House was getting continuing strong bipartisan support and the opposition had not gained momentum. Republican sources on Capitol Hill said as late as the day before the confirmation hearing when *Science* went to press that no concerted effort was being made to muster opposition to Stever.

Stever, if confirmed, would become the first full-blown presidential science adviser since President Nixon swept the scientists out of the White House in 1972. Since then, Stever has combined his role as ex cathedra President's science adviser with the directorship of NSF he has held for 4 years.

No Fresh Ideas

As once and future science adviser, Stever, not surprisingly, did not propose any radical departures when asked about his plans and ideas for the job. Stever told *Science* he will continue doing what he has done as part-time science adviser, but now expects to be more intimately connected with the daily problems relating to science and technology.

He says he hopes the office will be able to go beyond fire-fighting and into long-range issues, but "with the size of the office, long-range issues will have to be farmed out to agencies and others to study . . . we do not have as big a team as is needed." An immediate task is to sort out information that is already available: "There are quite a number of studies which either are pointed toward long-range issues or could be diverted to long-range issues, so the problem everybody has is then taking the studies that do automatically originate in our society and putting them to use."

Getting a little more specific, Stever said, "Science and technology is still going to be very important in the traditional roles it's had in defense. The space program has proved our tremendous technological capability. But we have not proven we can do as well in government with some of the civilian side of science and technology." He would like to see some studies of laws and regulations to see to what extent they may be slowing or misdirecting research in the private sector. Agricultural research is one category that requires a "new look," he said.

The first project to be overseen by the new office will be a 2-year study, mandated by the legislation, of the policies, programs, and organization of the entire federal science structure. An 8- to 14-member commission is supposed to be appointed by the President for this.

As for the role of the science adviser, Stever says, "the whole object is to try to be the translator—take ideas welling up in the scientific community and see that the government takes action on them."—J.W. and C.H.

with a very wide, multidisciplinary sweep." Specifically, "He would oversee U.S. initiatives in U.N. conferences, be involved with issues ranging from energy and environment to problems of biological experimentation, social and economic conditions. Economics should not be treated as a separate box. . . . I would want someone who will be thoroughly frank with the President about the resourcefulness of the scientific community to deal with a particular problem."

• **Theodore Roszak**, author of *The Making of the Counterculture* and critic of science: As far as "immediate public policy" goes, Roszak is concerned that "disarmament is particularly a lost issue covered up by a lot of very fraudulent negotiations. I would like to see a sincere effort. I would include some undramatic forms of disarmament, like clamping down on the international arms trade. The other issue is the continuing and somewhat deceptive energy crisis. I want a real effort at conservation. We have a whole unexplored frontier of conservation and thrift. I'm worried about the development of nuclear power. It's being sold to us as a necessity when it probably is not. I have been appalled by the fraudulence surrounding everything we have said and done about energy. The whole environmental movement has been flattened under the urgency of the energy crisis. . . . I am not sure the adviser has to be someone who is a scientist per se. What about Dan Greenberg [the gadfly science journalist]—someone with a strong sense of conscience

Briefing

New Data Suggest Decline in Industry R & D

Rumors that U.S. industrial R & D is in serious trouble seem to be confirmed by new federal data just released. The amounts spent on research are not keeping pace with inflation, and those that are spent are going increasingly for "defensive R & D."

In the 1950's and 1960's, industry R & D spending rose by as much as 7.7 percent per year. This rise peaked in 1967; since then spending has risen by a mere 1.8 percent per year, and in constant dollars has declined markedly. The important indicator is corporate R & D expressed as a percentage of total sales. During the 1950's and 1960's, this fraction nationally stood at more than 2 percent; in 1975 it was 1.8 percent.

Beginning with calendar year 1975, companies must report their R & D spending to the Securities and Exchange Commission according to a new, common formula. In its 28 June issue, *Business Week* magazine has printed these figures for 730 companies, thus offering the first company by company profile of the nation's industrial R & D.

The survey shows that some sectors of American business—the intensely competitive semiconductor industry, for example—are investing in R & D at healthy rates of 8 and 12 percent of sales.

But in other sectors, such as drugs and chemicals, in which R & D spending is traditionally high, research executives say that an ever larger share of the money goes to "defensive R & D"—research to make existing products meet government health, safety, and environmental regulations—rather than to new products. A stunning example is Du Pont, the sixth largest R & D spender in the country, whose managers claim that two-thirds of its $336 million R & D budget is spent on "defensive" research. They add that that fraction soon will be three-quarters of the total.

The sums spent by America's industrial giants on research are large even in comparison with the federal research budget. General Motors, the national leader, spent $1.113 billion on R & D in 1975 (its executives claim that some 40 percent, or $450 million of this is "defensive" research to meet government standards). American Telephone & Telegraph's research program, which includes the noted Bell Laboratories, spent $613 million on research in 1975, more than the National Science Foundation's entire budget that year.

Some companies openly admit that they are no longer creating new products and materials but are buying them abroad instead. For example, the steel industry, which has traditionally been a low R & D spender, bought or licensed much new technology from the West German steel industry. But lack of innovation can take its toll. The steel companies are now frantically trying to develop a high-strength, low-alloy pipe that can withstand arctic conditions; for the initial Alaskan pipeline construction, imported pipe had to be used. Next to steel, the building, food, fuel, paper, and textile industries historically have invested the least in R & D.

The new SEC data, which will be available annually from now on, have two chief advantages. One is that the common definitions of R & D now used by all industries will enable hitherto impossible comparisons of R & D spending among industries. Secondly, for over a decade, the National Science Foundation has been gathering industrial R & D data on an anonymous basis. Its definitions are nearly identical to the SEC's—the new information can thus help to expand on NSF's findings. If American industrial research is in a major decline, at least we will all know more about it.—D.S.

Pasteur Picks Monod Successor

Paris. François Gros, a molecular biologist who worked with Jacob and Monod on the discovery of messenger RNA, has been named the new director of the financially troubled Pasteur Institute to succeed Jacques Monod, who died suddenly on 31 May.

Considered by many to be the logical successor for Monod, Gros has been affiliated with the institute on and off since 1945 and has been the head of the service of cellular biochemistry there since 1972. He is a respected scientist, even if not a Nobel prize winner, and is considered a better diplomat, and more approachable than Monod was. "We *tutoie* Gros, where we always *vousvoied* Monod," said an American working in the department of molecular biology.

By their appointment of a scientist and a Pastorian, the administrative board, which now has a considerable proportion of governmental representation, seemed to indicate that they are not trying to impose a high degree of governmental direction on the institute, at least not yet.

The Pasteur survived a financial crisis last year when the French government provided substantial funding (*Science*, 21 March 1975). However, Gros faces the task of negotiating adequate continuing financial support for the institute and he also must rebuild inadequate facilities on the Paris campus and deal with serious problems posed by the Pasteur's unprofitable commercial production facilities for vaccines and other biologicals outside Paris.—LYNN PAYER

and honesty. In the whole area of conservation, I would hire Schumacher." Roszak said he had never heard of Guyford Stever.

• **Arthur Kornberg**, Nobel laureate biochemist: Kornberg wants "what I've been propagandizing for in the last few years—the need to do more basic science. We don't know enough biology to do a proper job in spending huge amounts of money successfully on cancer, heart disease. If I had the ear of the President I would certainly push for that. . . . We do live in a society that's based on science and technology and to have accountants run it without some advice on science and technology would seem to be downright foolish." He doesn't like the "expediency of doing something that has immediate visibility," as shown in such programs as the National Science Foundation's RANN.

• **Dixy Lee Ray**, former chairman, Atomic Energy Commission: Her "primary concern would be the public understanding of science." Science and its applications have become an "emotional area . . . knowledge always tends to override emotion." Ray would like to see "something akin to a Supreme Court in science—not an arbitration board but a hearing board" that would put everything on record and help the people arrive at their own judgments.

• **Willard Libby**, Nobel laureate chemist: "I think we ought to support good basic research more strongly . . . the applied work is much more expensive and usually less rewarding . . . you never get the facts with applied research." In particular, "the area of chemistry called heterogeneous catalysis is very badly neglected. . . ."

• **Bruce Murray**, astronomer, director of the Jet Propulsion Laboratory: "Science and the institutions of science are in a period of change. . . . I think the politicians are way out in front of the scientists" in perceiving this. "The hallmark of science is a high degree of arrogance. Others at least recognize that they don't understand what's happening." The science adviser "has to be someone who has risen above [parochial interests], who can help the President deal with the priesthood. I would urge the new science adviser to probe some of the unexamined assumptions about science and public policy," the assumption, for example, that science should be institutionalized and that scientists are an elite. "Scientists are unusually naive—they are changing, but only bloodily. They're as bad as the medical doctors in not really having an understanding or feeling about where we're going. There is a case to be made that institutions of all kinds are going to evolve and be internalized by society, with science becoming part of the knowledge and language of the populace. Ideally, the science adviser would be a person who is not afraid of the future and what's going on. One issue blatantly ignored is whether or not industrial societies will have to decentralize . . . things need to be less coupled together, less interdependent, to move away from centralization, concentration, and larger and larger economic structures. I think science is going to be radically changed by the process." As for past advisers, their real usefulness has been "providing a quiet window for the budget bureau on the issues. Killing them off in 1972 removed the window. Their main value has not been advising the President but being a loyal, informed, and broadly based source. This is the best to be hoped from the new science adviser."

When Nixon abolished the post of science adviser in 1972 there were howls of anguish from the scientific community. Now they have what they wanted. Is the job symbolic or does it really make a difference? That depends not only on what the adviser advises but on whether the government is prepared to listen.

—CONSTANCE HOLDEN

Confidentiality: Court Declares Researcher Can Protect Sources

In a precedent-setting case, a California court has ruled, in effect, that an academic researcher has the same right to protect confidential sources of information as does a journalist. "Society has a profound interest in the research of its scholars, work which has the unique potential to facilitate change through knowledge," San Francisco judge Charles B. Renfrew of the United States District Court said in an opinion* in a case in which he denied a motion to force a Harvard professor to turn over notes from confidential interviews. "Compelled disclosure of confidential information would without question severely stifle research into questions of public policy, the very subjects in which the public interest is greatest," Renfrew wrote.

Harvard University general counsel Daniel Steiner says, "This is the first case I'm aware of where a court has recognized a public interest in confidentiality of researchers' notes."

The case has clear First Amendment implications even though Renfrew chose to base his decision on narrower grounds, namely the court's discretionary power to decide what must be admitted as evidence. Here, he had to decide whether the social costs of forcing disclosure were greater than the value of the evidence to the party that was seeking it.

"Whether the public interest in protecting confidential relationships between academic researchers and their sources rises to the stature of a constitutional privilege need not be resolved by the instant case," Renfrew declared, but he also noted that "the cases most closely analogous to the present facts are those involving the qualified First Amendment privilege of newsmen not to testify."

The facts are these. During 1973 and 1974, Marc J. Roberts, professor of political economics in the Harvard School of Public Health, interviewed a number of employees of the Pacific Gas & Electric Company (PG&E) as part of a study of the way the organizational structure and management practices of three public and three private electric utilities affect the impact those companies have on the surrounding environment. Roberts was interested, in particular, in decision-making processes within the companies, his hypothesis being that different organizational circumstances could influence the expression (or lack thereof) of a utili-

*Because the case was settled out of court on the eve of the trial, Judge Renfrew was not bound to issue an opinion in the matter involving Professor Marc J. Roberts. He did so, however, because he felt that a written discussion of his reasons was warranted in light of the "importance and novelty" of the issue.