ing the Hoover Institution at Stanford, where he has been a senior fellow and an associate director. Bueche, on leave from GE, will serve as a policy coordinator for science and technology on Trent's staff. Bueche was unavailable for comment.

Another set of transition teams are operating at the agency level. These are "fact gathering" groups following guidelines set by the transition organization's deputy director William E. Timmons, who was a top congressional liaison man in the Nixon White House.

The guidelines direct that each team identify problem areas for their agencies and describe early decisions that will have to be made. Also, reports on budget, personnel, policy, and the status of legislation are asked for. The aim is to inform leading Administration officials and assist Reagan appointees who will take over.

The National Science Foundation has been assigned a team so high powered that NSF staff seem a little overwhelmed. Headed by former NASA administrator and present University of Utah president James Fleecher, the team includes three members of the science and technology task force—David, Seitz and Stever. Other members are Ray Biplinghoff, a former NASA and NSF official who is now an industry executive, and Donna Fitzpatrick, an attorney in a Washington law firm and former science teacher. Sending a slight frisson through the Washington education community is the presence on the team of George Archibald, a congressional staffer who was formerly an assistant to former Arizona Congressman John Conlan, a scathing critic of NSF school curriculum development programs and peer review practices.

The team assessing the National Institutes of Health is headed by David A. Winston, minority staff director of the Senate Labor and Human Resources Committee. Much of the information gathering at NIH is being done by Mary Frances Lowe, a member of the staff of Senator Richard S. Schweiker (R-Pa.). Both Winston and Lowe have worked for Schweiker, and this suggests that there may be substance to rumors that Schweiker, who retired from the Senate this year, could be the new Secretary of Health and Human Services, the parent agency of NIH.

Concerning science and technology policy, it is easier to predict what will be recommended than what will actually be implemented by a Reagan Administration. Reagan himself has evinced no particular fascination for science and technology. David suggests that the President-elect is interested in the practical implications of science and technology, for example, for defense or the economy. The Reagan Administration view is likely to be that government should support science and technology when tied to a specific mission—defense, space, health—but should leave alone or get out of things appropriately done by the private sector.

From the choice of advisers, it appears that science and technology policy is not a source of conservative-versus-moderate tensions in the Republican camp, as some other issues are. Several members of the task force in fact were identified earlier with GOP liberal Nelson Rockefeller who had a penchant for pushing science in government. It now seems that a friendly, if frankly more utilitarian attitude toward science and technology will prevail in the new Administration. Speculation on just how that will work itself out in appointments, policies, and budgets is at this point just that.

—JOHN WALSH

Senator Schmitt, New Science Power

Republican Senator opposes synfuels program, calls Carter's science office "emasculated"

Senator Harrison Schmitt (R-N.M.), the Harvard-educated geologist and astronaut, has suddenly become the most important figure in the Senate for science and technology. Ronald Reagan's landslide shifted the majority in the Senate into Republican hands. With the shift, many Republicans who have led a fairly obscure existence now find themselves running committees.

Schmitt will take control of the Commerce subcommittee on science, technology and space, an overseeing and authorizing body formerly chaired by Adlai Stevenson III (D-Ill.). Schmitt also has acquired the chairmanship of the Appropriations subcommittee on labor and health, education, and welfare. It controls the budget of the National Institutes of Health, among other agencies. Schmitt will not chair, but will sit on the Appropriations subcommittee on the Department of Housing and Urban Development and the independent agencies, which controls the budget of the National Science Foundation (NSF). That subcommittee will not be chaired by Charles Mathias (R.-Md.), who was expected to take over. (He is counted as a friend of the NSF.) The subcommittee will be chaired instead by Jake Garn (R-Utah), whose views on science matters are as yet unknown.

But Schmitt has asked the new majority leader, Howard Baker (R-Tenn.), to add to Schmitt's science empire by shifting the authorization responsibility for the NSF into the Commerce subcommittee that Schmitt chairs. That responsibility now lies in the Labor subcommittee on health, chaired until recently by Edward Kennedy (D-Mass.). Baker is considering the request.

In an interview with *Science* on 5 December, Schmitt placed himself squarely among the economic moderates in the new Administration. He said it would be a mistake to jolt the economy now with the kind of "shock treatment" being advocated by such Reagan advisers as Representative Jack Kemp (R-N.Y.). Schmitt opposes Kemp's plan, which would try to stimulate economic growth by reducing personal income taxes massively and by cutting the federal budget. This policy of "cutting wherever there is money to cut," Schmitt said, might produce a brief spurt of growth, but not the huge investments in new technology which will be required over the long term to make the economy productive.

Schmitt recognizes that Reagan's promise to increase defense spending while reducing taxes implies large budget cuts. But he does not favor drastic measures. He thinks that many of Reagan's advisers appreciate the value of government support for research and development, and he thinks they will be pre-

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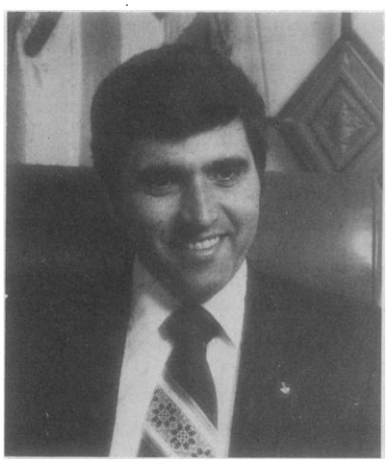
pared to fend off the budget cutters. However, Schmitt could not predict whether the drastic slashers or the moderates would win the in-house debate. Nor could he anticipate which areas of research might survive the approaching storm. He did express his concern about oil and mineral imports, and he stressed the importance of space exploration. Excerpts from the interview follow.



Yes to space, no to synfuels

Senator Schmitt chairs two science committees.

Q: Because of the new emphasis on defense and the pressure to cut the federal budget, there is some fear that funds for research and development may be cut back, particularly for work that is not related to defense. What do you think will happen?

A: I can't give you a good prediction there. There are mixed signals. The policy groups that have been advising Governor Reagan for several months . . . are very bullish about the economic returns of science and technology investments. [Federal research expenditures] are fundamentally deflationary in their long-term economic impacts, and necessary if we're going to have a full recovery of the economy.

On the other hand, I've seen statements attributed to Congressman Kemp and Congressman Stockman and George Shultz to the effect that the economy needs a shock treatment, and the treatment should be administered without discrimination, wherever there is money to be cut. I frankly think that is unnecessary and extraordinarily dangerous. You might have a brief pulse of improvement, but the country will start going downhill again very rapidly unless we rejuvenate our technological base.

However, let me say that I think that those areas of science and technology that are short-term in their impact can be best handled in the private sector through tax and regulatory incentives. Those that are long term and high risk are going to need a major federal presence. The really tough decisions come for those ventures that are almost economic . . . but may not quite be. There loan guarantees may be appropriate, and will have to be dealt with on a case-by-case basis.

Q: Do you have a plan in mind for encouraging private investment in R & D?

A: In this case, science and technology policy is determined by tax and regulatory policy. I believe that the one essential thing necessary to get this economy moving is a reform of tax policy. . . . You can reduce, if not eliminate, taxation on interest that comes from savings and investments. You can provide tax credits for business investments in new technology and research and development. You can reduce the capital gains tax. There are just a whole bunch of things that will get the economy growing again. . . .

Q: Do you belong to the school that believes this is a long-term project and that you cannot expect to do much in the first year?

A: You have to lay the groundwork the first year because you won't be able to document convincingly major changes in inflationary trends for about 18 months. . . . I don't think the measures have to be drastic. The critical thing is to make tax and regulatory reforms that in themselves do not significantly affect the deficit but provide the incentives for new investment to occur.

If you apply the shock treatment, I'm not convinced it's going to work. And if you do it with your whole tax program concentrated only on the personal income tax, you're going to raise the deficit. There's no question about it, particularly if you increase defense spending.

I would wait a year for the major personal income tax changes. Let the savings and investment credits get the economy moving again, so that federal revenues are on the upswing, and then you can go into personal income tax credits. Now, politically it may be desirable to have some personal income tax cuts mixed in with the other tax incentives. But that's a balancing act. . . .

Q: President Carter's science adviser, Frank Press, maintained that the Administration increased support for basic research in real terms by something over 10 percent each year. What do you think is the minimum support needed to sustain federal basic research programs, and how would you allocate funds among competing programs?

A: I don't believe the Administration's claim will stand up to scrutiny. And I don't think you can approach it that way. I think you have to look at the major national problems that require emergency federal expenditure or a long-term expenditure and take them on a case-by-case basis.

Q: What are the most important problems?

A: In the short term, obviously, we must do everything we can to reduce our dependence on foreign imports of oil and strategic minerals. In spite of everything else that makes the headlines, the most serious immediate threat to national security that this country faces is its dependence on those imports: 45 percent in the case of crude oil and 65 percent in the case of major strategic minerals. Ending that dependence is going to require a coordinated set of economic, regulatory, and research activities, the like of which the country has never seen. . . .

In the short term we have no alternative but to produce more oil and natural gas and use them more efficiently. In the intermediate term . . . we can use coal in an environmentally safe way and nuclear power. . . . In the long term there are so many alternatives, it is difficult to decide which ones to pursue most vigorously. I believe that within 10 years . . . we could demonstrate the commercial feasibility of fusion power, and within 20 years we could have a major commercial fusion plant in operation. . . . As a portable fuel we will eventually be headed toward hydrogen.

Q: Does that mean the government's commitment to create a synthetic fuels industry is misguided?

A: Yes. I worked against it. It was a terrible mistake. It means that the synthetic fuels industry will be controlled by political forces and not economics. For a much smaller exposure for the taxpayer, about $3.5 billion, we could have moved much more rapidly than we will toward demonstrating which synthetic fuel technology will be the most economical. . . . But we passed the bill [authorizing an $88-billion synfuel loan program].

Q: What changes would you like to make in the way Congress handles science policy and research funding?

A: There must be a much stronger interaction between the Congress and the Administration on science policy. Senator Stevenson and I had a very difficult time establishing any consistent, coordinated interaction with the White House, and I hope that that will improve in the 97th Congress.

Q: How would you like to see the White House science and technology office operate under Reagan?

A: I think the science office under Carter was basically emasculated. I don't think it was a White House advisory office in any obvious way, and it should have been. Science and technology are too important for this country not to have that person at the same level as the national security adviser or anyone else who is an immediate adviser to the President. It has to be that kind of an office. If Governor Reagan does not recognize it as such, then a lot of us are going to have to do everything we can to convince him. . . .

Q: Have you spoken with him about this?

A: No. I am scheduled to meet with him on Friday [12 December]. But the main point that I want to talk to the President-elect about is the perspective we must have relative to a long-term involvement in space. We are in competition with the Soviet Union in space, and they are proceeding with much clearer purpose, albeit with inferior technology. There is no question in my mind but that the future of human relations on earth will be determined by the kind of civilization that is dominant in the beneficial and defense uses of space technology. The Soviets recognize that; we have not recognized it.

The historical analogy is clear. Our position with respect to the "new ocean of space" is completely analogous to the British nation's position with respect to the oceans over the last several centuries, until World War I. We cannot turn our backs on that. The schedule we assume—that's an item for debate. But to say that we will not compete, that we are going to allow the Soviet Union, representing a civilization of oppression, to dominate human activity in near-earth space, or on the planets, or anywhere else, would be to turn our backs literally on the survival of freedom on this planet.—ELIOT MARSHALL

Simon Ramo's Prescriptions for Innovation

A Reagan adviser says America's technology slip is showing, and offers some remedies

A clue to Ronald Reagan's future science policy may be found in the thoughts of Simon Ramo, the energetic and vocal director of TRW, Inc., now serving as cochairman of Reagan's science and technology task force. Ramo is not a close personal friend of Reagan's, but he is well known and well liked among the wealthy industrialists who compose the president-elect's brain trust. Moreover, the science policy issues confronting the new Administration have long been the object of Ramo's scrutiny, and he already has in mind a blueprint for improving U.S. industrial and technological performance—a blueprint that includes sweeping changes in regulation, taxes, patents, and federal subsidies for applied research.

Ramo's blueprint is derived largely from his experience as founder and a director of the Ramo-Woolridge Corporation, which became TRW in 1965. TRW makes auto parts, advanced electronics, spacecraft, and machinery parts. Under the direction of Ramo and his cofounders, TRW prospered mightily through various recessions, a rise and fall in defense spending, and a severe cutback of the space program. Its annual sales currently stand at nearly $5 billion. Ramo's concern for technology policy stems from a conviction that his company's stellar achievements need not be unique.

Ramo, 67, has recently published two books that offer insights into his thinking, *America's Technology Slip*, and *The Management of Innovative Technological Corporations*.* The former, aimed at the lay public, is said by its publisher to be enjoying strong sales. The book's theme parallels that of earlier Ramo publications: The United States "is experiencing the malaise, dislocations, and frustrations of an immense, almost uncontrollable imbalance between rapidly accelerating technological advance and lagging social progress." America has the technological tools it needs in order to be competitive in world markets and prosperous at home, but it does not know what to make of them. "We can be likened to a group of inept carpenters," Ramo says, injuring ourselves and others, not knowing what to build, and then blaming the tools instead.

What is needed to reduce inflation and enhance productivity is a more favorable climate for innovation, Ramo says. The government can go a long way toward creating this environment by permitting accelerated depreciation of plant equipment, eliminating capital gains and savings income taxes, and reducing the tax on corporate income, relying solely on taxation of shareholder income.

Ramo believes the climate for innovation can be improved by better decision-making and more leadership at the federal level. Specifically, this means reaching a broader consensus on the benefits of such controversial technologies as nuclear power, pesticides, or synthetic fuels. As Ramo sees it, innovation is too often hamstrung by disagreements over such pressing issues—typically between corporations on the one hand and politicians and their constituents on the other.

Ramo rejects the average industrialist's view that "any problem the nation faces can best be handled by the government's keeping its hands off and leaving everything to the private sector." He suggests that such opinions are hypocritical. "Many executives are quite accustomed to delivering a luncheon address on the benefits of free enterprise and the ills of control by government, then hurrying to meet with government agencies from which they seek contracts, special subsidies, and general favors." He needles Reagan himself by writing that, "stopping inflation is not simply a matter of 'getting the government off our backs.' "

Drawing on his experience in various space and defense programs, Ramo insists that government involvement in R & D is necessary. "Private investment at risk is not consistent with situations in which government responsibilities . . . are in the end unavoidable, or where proprietary know-how developed at private expense is difficult to protect from competitors." Agriculture, energy, and defense are categories of R & D where ultimate federal decisions are crucial to profitability, and are thus legitimate areas for federal subsidy. The difficulty arises when the government attaches too many rules to its money, mini-

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