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NEWS AND COMMENT

Technology Initiatives: Hints on the Magruder Effort

In coming weeks President Nixon is expected to announce the new technology opportunities program designed to lift the $28-billion U.S. research establishment from its current trough of fund cuts, scientific unemployment, and charges that science and technology are producing little of relevance to national problems. The plan will be based on the efforts of the Office of Science and Technology and William M. Magruder, special consultant to the President, who was appointed, with much fanfare on 13 September 1971.

The Magruder appointment and accompanying rumors that the President personally prized the advice of Magruder, the former director of the supersonic transport (SST) fight, over that of his science adviser, Edward E. David, Jr. (*Science*, 22 October 1971), created conflicting waves in the scientific community. Among them was stirred the inevitable hope—perhaps now a pipe dream—that Nixon's concern for U.S. leadership in technology would prompt him to overhaul policy on R & D.

As of now, however, some hints can be gleaned as to what the program may contain. The technology opportunities program is expected to receive some mention in the State of the Union address which President Nixon will give on 20 January. The program is expected to be announced in detail in February according to the current schedule.

Financially the program appears at present to fall far short of the scientists' dreams of billions. While overall national R & D funding is expected to rise a bit in fiscal 1973 to approximately $18 billion, only a small portion of this total—perhaps no more than a couple hundred million dollars, will go specifically to Magruder's program. Unless the President culls other money from other federal projects and asks Congress for supplemental appropriations (as he did with his energy program announced in June 1971), the technology program will be a very modest one in the coming fiscal year.

It is too early for the exact shape of the program to be known, and White House sources say that they expect the plan to remain in a state of flux up until the time it is announced. Also, last minute decisions could change all previous plans. However, through conversations with a number of nongovernment scientists who have contributed inputs to the Magruder study, *Science* was able to draw up a list of some of the front-running proposals.

It is not known whether the President will announce a broad package of "initiatives" in several different problem areas, from natural disasters to transportation, or whether he will concentrate on one or two.

Magruder apparently has sorted out eight main problem areas where government support might aid some high-risk, but socially and economically useful "initiatives" in getting off the ground. Unknown, at the present time, is exactly how any of these initiatives would be implemented—whether by loans, subsidies, tax exemptions, or new administrative arrangements.

► *Productivity.* Certain industries may be selected where further automation

can produce more goods without significantly increasing labor costs. Possible expansion of state commerce extension services have been considered. Ways to increase marine productivity have been suggested, including a scheme to build ocean platforms that would act as bases for sea-floor development and as shipping transfer points.

► *Health care.* Drug abuse is a likely subject for mention. Also health delivery systems, long the pet dream of a certain segment of the electronics industry, could receive a boost. Or engineering aids to the disabled such as prosthetic devices, or special aids to the deaf and blind, or increasing the nutritional value of foods might merit approval.

► *Technology for meeting air quality standards economically.* Clean energy has long been a sacrosanct goal of the environment movement. Various projects are possible, such as the linking of four Chicago incinerators to a comprehensive system in which urban solid waste would be recycled. Power generation through the gasification of high-sulfur fuel has also been proposed.

► *Protection from natural disasters.* Prediction and early detection of earthquakes is likely, as well as detection and control methods for forest and other kinds of fires. Still other possibilities include building more airplanes for improvement in weather modification and control, and warning systems for floods and landslides.

► *Transportation.* An obvious range of transportation projects would involve utilizing NASA's capabilities and applying them to such things as urban transit systems. The President may even count the space shuttle as a new technology initiative. Of course, there is speculation that Magruder might include the SST in the new technology plan. Anything can happen.

► *Communications for social needs.* Under this heading come a number of telecommunications proposals: automated teaching devices, domestic and global satellite systems, and something called "the wired city" in which communications are so perfected that the alarmed citizen, by pressing a button on his phone, indicates to the police exactly where a crime is being committed.

► *Natural resources.* Various proposals for the development or increase of key minerals and fuels fall into this category. Included are a plan to aid the recovery of alumina (now imported from Canada, Africa, and other places) from U.S. clay to lower the cost

Briefing

Cancer Crusade

"I hope that in the years ahead that we look back on this day and this action shown as being the most significant action taken during this Administration." So declared President Nixon 2 days before Christmas in signing into law the National Cancer Act, the basis for what Nixon called "our great crusade against cancer." Leaders of the crusade, who will control an important slice of the country's biomedical research funds, are now being selected by the White House and will probably be announced within the next few weeks.

Candidates for the directorship of the expanded National Cancer Institute (NCI) have been narrowed down to three or four people, including the present NCI Director Carl G. Baker. But at least one former front-runner, R. Lee Clark of the M. D. Anderson Institute at Houston, is reported to have lost interest in the job because the new legislation does not accord the NCI the degree of independence from the National Institutes of Health that was at one time envisioned.

Another disincentive that the new director will have to live with is the two separate oversight bodies created by the act—a three-man President's Cancer Panel and a 23-man National Cancer Advisory Board. The relation between these two bodies does not yet seem to have been precisely worked out, but neither is intended to play a purely cosmetic role in the NCI's affairs. The three-man panel is obliged by law to meet 12 times a year and to report back directly to the President. The National Cancer Advisory Board (which replaces the National Advisory Cancer Council) includes as ex officio members the Secretary of Health, Education, and Welfare, the director of the Office of Science and Technology, and the director of the National Institutes of Health.

Chairman of the presidential panel is Benno C. Schmidt, a New York businessman who headed the Senate-appointed panel on cancer, which provoked the new legislation. The two other triumvirs have yet to be appointed, but one is expected to be a research scientist and the other a doctor. Over and above its statutory authorities, which include making an annual report to the President and informing him of any delays or blockages in the crusade as they occur, the panel is expected to serve as a bridge between cancer research and private industry. There are expected to be substantial opportunities for profit in the new cancer effort; even at the present (fiscal 1972) level of expenditure, firms such as Microbiological Associates and Bionetics Research Laboratories, both in the Washington, D.C., area, have contracts worth more than $5 million with the NCI.

Another function envisaged for the three-man panel is to serve as a court of appeal for scientists outside the NCI. A staff aide to Representative Paul G. Rogers (D–Fla.), chairman of the subcommittee that wrote the new cancer act, says of the panel: "You can't bitch to the [National Advisory Cancer] Council because they run the program. But the panel will be a court of appeal, a confessor to whom scientists will be able to complain with impunity."

The 23-man National Cancer Advisory Board is also destined for close involvement in the impending crusade. A White House aide says he sees the board as acting like the board of directors of a private corporation and playing a much stronger role than does the existing council. Membership of the board will consist of scientists, doctors, and representatives of the general public.

All members of the director-panel-board hierarchy are presidential appointees and will presumably have a major voice in deciding the tactics and strategy to guide the foot soldiers of the biomedical community in the new crusade.—N.W.

of aluminum, and one to remove sulfur from coal. There are proposals to increase the efficiency of irrigation in the Southwest, and to develop the continental shelf, and restore the fish population. Another proposal would even provide helicopters with which to log forest areas.

► *Cities and suburbs.* Proposals for aiding the development of industrialized housing—already part of an ambitious program in the Department of Housing and Urban Development—and plans for neighborhood preservation are in this category, although similar proposals have been gathering dust around in government files since the early 1960's. Another plan would integrate public utility use.

Magruder also sought changes in government policy which might encourage R & D, particularly in industry. A prominent proposal, largely accredited to the Industrial Research Institute (a national organization of research managers of private industries), was for a 25 percent tax exemption on industry baseline costs of R & D. How the tax would work, in detail, is not known, but the aim would be to make it cheaper for a company to invest in research. The need to maximize profits has forced many major U.S. corporations to cut back their basic research laboratories by about 30 percent in the last few months (*Science*, 17 December 1971). Other proposals have included the creation of a new office of technology reporting to the President, for the management of the technology initiatives in the agencies in whose jurisdictions they would normally fall.

There was wide support for the basic concept of the Magruder study among the industry and university administrators and scientists whom *Science* consulted. The notion of linking the ills of the nation's scientists to the related maladies afflicting the U.S. world trade position and domestic situation has apparently struck a very responsive note among many scientists.

However, in terms of science policy, many see the President's space shuttle announcement of 6 January as a complete about-face from this progressive approach that has been touted. The space shuttle, which will cost $6.5 billion, and create 50,000 jobs (half in southern California), has no particular relevance to domestic needs. It represents, many believe, exactly the short-term, artificial, forced feeding of R & D which has characterized U.S. technology over the last decade and left one segment of the economy—the aerospace business—in a shambles. The shuttle green light as a sop to the California vote in the presidential elections in November.

Other sources point out that many of the proposals Magruder has been sifting through are old. They were already considered by the government at one time or another, and many were rejected, perhaps for good reasons. According to this line of thought, for even a man of Magruder's energies to devise in 4 months a low-cost plan for solving some of the nation's key environmental, urban, and economic problems, is simply asking for the impossible.

—DEBORAH SHAPLEY

Arms Control and Disarmament: SALT, CCD, CTB, MBFR, Etc.

Since the beginning of the nuclear era, arms control diplomacy has concentrated successively on single, well-defined, limited objectives. The partial test ban treaty in 1963 and the nuclear nonproliferation treaty (NPT), which went into effect in 1970, have been the most important products of the process. Now, although the strategic arms limitation talks (SALT) between the Soviet Union and the United States command primary attention, the arms control dialogue has done some proliferating of its own, as have the acronyms and abbreviations of arms controlese.

Efforts to achieve a comprehensive test ban (CTB) are continuing, and prospects of finally bringing underground testing under the ban seem to have brightened recently. (Developments that have reduced chronic impediments to a CTB are discussed in an article on page 283.)

The arena for test ban talks has been the Conference of the Committee on Disarmament (CCD), lineal descendant of an 18-nation group that was formed under U.N. auspices in 1962 and has met intermittently in Geneva to work on arms control and disarmament problems ever since. There are 25 nations now in CCD, including the nuclear powers minus China and France.

It was CCD which negotiated the recently concluded Seabed Arms Control Treaty, which prohibits the installation of nuclear weapons on the seabed outside a 12-mile limit. The seabed treaty, like the Outer Space Treaty (1967) banning orbiting nuclear weapons in outer space, appears to foreclose the deployment of some exotic new weapons systems, but, in the case of the seabed treaty, probably no nuclear power was seriously inconvenienced, since nuclear weapons installed on the seabed are viewed as being relatively easy to locate and attack.

The CCD, however, is also the source of a proposal that is likely to become the first genuine disarmament measure—as contrasted to arms control measure—since the pre-World War II era. The CCD has sent the United Nations a draft biological warfare (BW) treaty, which prohibits the development, production, or stockpiling of biological weapons, including toxins. Research on defensive measures is permitted in the draft treaty and is in fact encouraged, in part at least because some such research is virtually indistinguishable from valuable nonmilitary biomedical research. A BW treaty, unlike the seabed treaty, would deal with weapons that are real, but risky to a potential user.

A ban on chemical warfare (CW) is also on the CCD agenda, but is regarded as even more difficult to achieve than a BW treaty. Chemical weapons have been used in this century with much effect. They are relatively cheap "weapons of mass destruction," which