NAS: President Needs Advisory Council

For two years, relations between the White House and the scientific community have steadily deteriorated. First came the resignation of Presidential science adviser Edward E. David, Jr. and the disbanding of the Presidential Science Advisory Committee (PSAC) (SN: 1/13/73, p. 20). The official explanation was that since science serves many areas of government, each branch should maintain its own technical staff and that whatever advice the President might need concerning "pure" science, he could learn from the head of the National Science Foundation. Hence, foundation director H. Guyford Stever was given the title of Presidential science advisor, even though he would remain, physically and spiritually, at NSF—a safe distance from the White House inner circle (SN: 1/27/73, p. 52).

Unofficially, that inner circle was known to be displeased at the outspoken oppisition of some PSAC members to the Vietnam war and with the generally anti-Administration view of many academic scientists. In fact, the new science adviser was not to report to the President directly, except on urgent matters, but rather to work through the Office of Management and Budget (OMB) and the office of then Secretary of Treasury, George Shultz. Cavalierly dismissed were objections that Stever inevitably faced a conflict of interest in his dual role as advocate (for NSF and "pure" research) and adviser (theoretically telling OMB how much money to allot to each technologically oriented agency, including his own).

Congressional concern over this arrangement grew as evidence mounted that Stever, in fact, almost never was allowed to see the President and as rumors persisted that Nixon's real personal adviser on matters of science was someone totally outside the Government, Bell Laboratories President William O. Baker, who had led the Science and Engineering Council for the Reelection of President Nixon (SN: 7/28/74, p. 52). In an interview with SCIENCE NEWS, Stever said he was trying to cooperate with Baker and keep alive the idea that "basic science is part of the whole structure" (SN: 12/1/73, p. 343), but concern over the effectiveness of this tenuous relationship grew with the urgency of the developing energy crisis and Congress has once again begun to hold hearings to see if some new structure of Presidential science advising ought to be legislated.

Last week that initiative received a powerful stimulus in a report issued by a committee of the National Academy of Sciences. While expressing admiration for Stever's game efforts to fulfill his dual capacities, committee members found the current arrangement "inherently unsatisfactory and insufficient." In its place was proposed establishment of a Council for Science and Technology (CST) whose penetration of the Administration infrastructure would go beyond that of any previous arrangements.

Led by Chairman James R. Killian, Jr., who had served as President Eisenhower's science adviser, the committee recommended that CST be established as a staff agency in the Executive Office of the President and be composed of at least three members, selected by the President, who should have his confidence and enjoy direct access to him (compared to PSAC, whose members were generally considered outsiders). The council chairman should serve as a member of the powerful Domestic Council, the committee advised, and participate actively in the work of the National Security Council. Further, CST should be given a voice in foreign affairs by working with the Secretary of State in matters relating to international scientific and technological cooperation, and should work closely, as equals, with OMB in deciding what funds to allocate to various competing Government agencies.

In addition to advising the President and his staff on daily technical matters, the committee recommended that CST submit a yearly report on major developments in science and technology that might have significance for national policy. As a corollary suggestion, the committee recommended that some separate body be established to conduct longer range policy research and analysis.

Chairman of the House Committee on Science and Astronautics, Olin E. Teague (D-Tex.) announced that the committee's staff would begin to draft legislation along the lines of the committee's recommendations. Having thrown the last science advisory committee out of the White House and personally sanctioned the rise of OMB in policy making areas, President Nixon might well veto such a measure, but the White House is giving little consideration to this whole area at the moment. Vice President Gerald Ford, should he rise to the Presidency, is expected to be more responsive to such advisory bodies as the proposed CST.

According to the committee report, establishment of a Council for Science and Technology would help assure that responses to such crises as the oil embargo would possess a sound technological and scientific base. In addition, a scientist must feel "the future in his bones" (C. P. Snow's phrase), and CST would help assess the possible impact of new discoveries and be able to recommend proper steps to see that the impact is beneficial.

The Killian report was "strongly endorsed" by the Academy Council at its June 9 meeting and Academy President Philip Handler told SCIENCE NEWS the success of the proposed CST would depend on whether it could become "a part of the whole team" in the White House. □

Vannevar Bush, first science adviser, dies

Vannevar Bush, the first Presidential science adviser, who marshaled American technology for World War II and then laid the groundwork for subsequent Federal support of scientific research, died last week in Belmont, Mass. The 84-year-old electrical engineer and master scientific administrator had been in failing health for over a year, then suffered a stroke in early June and finally succumbed to pneumonia.

Bush epitomized the application of Yankee ingenuity to the complexities of advanced technology. A descendent of New England whaling captains, he loved nothing better than watching song birds near his summer house on Cape Cod and he invented a bird feeder that would support the weight of the small songsters but not any heavier bird, such as a pigeon. His ingenuity earned him hundreds of patents and, coupled with considerable enterprise, helped him achieve respectable wealth through the formation of several companies, including the forerunner of Raytheon.

But his special talent was techno-

Vannevar Bush, in an old picture, watches his early analog computer work.

logical foresight and a persuasive managerial skill. Over a year before Pearl Harbor, he had convinced President Franklin Roosevelt of the necessity of establishing a National Research Defense Committee to help the nation's armed forces catch up with Hitler's sophisticated war machine. The committee was replaced the next year with a more permanent Office of Scientific Research and Development, which, under Bush's leadership, not only began the push to develop an atom bomb and encouraged development of radar, rocketry and the mass production of antibiotics, but for the first time brought the highest level of scientific advice directly into the White House.

At the war's end, Bush immediately began a campaign to continue Federal support of science for peacetime uses. Arguing that the vast pool of scientific expertise brought together during the war must not now be allowed to dissipate, and that the GI Bill could be used to train the next generation of scientists, Bush declared (SN: 12/22/45, p. 386): "We undoubtedly have a new stock of dammed-up ideas. It will be interesting to watch what happens as the dam breaks." The upshot of his campaign was creation of the National Science Foundation.

Though he invented the forerunner of the analog computer—a great, whirring mechanical and electronic monster with 150 motors—he was modest concerning the impact of his own ideas on the many projects he supervised. "Not a single idea of mine ever amounted to shucks," he once wrote, yet he developed the system of "mission-oriented" research that led to almost a mass production of ideas and inventions. The eventual result was "push-button warfare" (a phrase he hated), and though he was a lifelong supporter of a technologically strong military, toward the end of his life he said they were overdoing things. For his services, he received the Medal of Merit and National Medal of Science. □

Gene therapy: One step more

During 1971, a virus was used to introduce a specific gene into a mammalian cell. The gene provided genetic information that was missing in the cell —information needed to make a particular enzyme. After the gene was provided by the virus, the cell started producing the previously absent enzyme and passed the ability to do so on to succeeding generations of cells. The investigators were Carl R. Merril and John C. Petricciani of the National Institutes of Health and Mark R. Geier of George Washington University (SN: 10/23/71, p. 281).

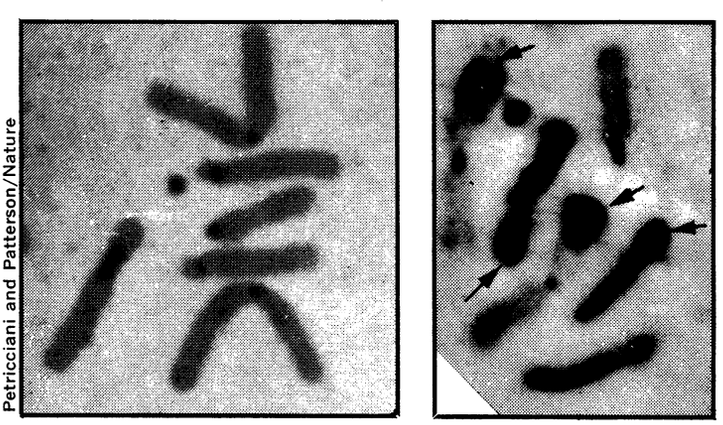
This remarkable step toward human gene therapy was closely followed by another one. Pradman K. Qasba and H. Vasken Aposhian of the University of Maryland School of Medicine showed that not only could a virus deliver missing genes (DNA) to human cells, but that the missing genes indeed ended up in the cells' nuclei (SN: 10/30/71, p. 291).

Petricciani has now found that synthetic DNA, as well as viral DNA, can be incorporated into mammalian chromosomes. This achievement is still further proof that human gene therapy is possible. Or as Petricciani puts it, "It's another little bit of evidence that if you introduce foreign genes into cells, they can interact with the normal DNA of the cells." Petricciani is now with the Food and Drug Administration. He reports the achievement along with his FDA colleague Rosalyn M. Patterson in the June 14 NATURE.

Actually Petricciani and Patterson did not do these experiments on human cells, but on cells from the Indian barking deer. A human cell has 46 chromosomes, the deer cell only seven, so that the latter is a lot easier to work with. They inoculated the deer cells with synthetic DNA, that is, with DNA whose nucleotide composition was entirely known. That way they knew exactly what genetic material they had.

They then looked at the chromosomes to see whether the synthetic DNA had been incorporated into them. Here they used a chromosome staining technique that allows scientists to distinguish the shape of each chromosome distinctly (SN: 9/25/71, p. 202). The technique showed that the synthetic DNA was indeed attached to the chromosomes.

If the deer cells can pass the synthetic DNA on to progeny cells, then, Petricciani and Patterson say, "it should be possible to use synthetic nucleic acids in gene therapy rather than viruses which carry unnecessary and often unwanted genetic information in addition to that which may be therapeutically useful." □



Six normal chromosomes (left). Chromosomes with new DNA on them (arrows).