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At APS Centennial, Past Presidential Science Advisers Recall Some Pleasures and Pains of a Fretful Job

The chance to actually see and hear eight former science advisers to US presidents attracted nearly 5000 of the 11 300 physicists and physics students who attended the centennial meeting of the American Physical Society, held in Atlanta. Just about every seat in the vast auditorium of the Georgia World Congress Center was filled before the session started on 22 March, and latecomers groped through the darkened hall to the accompaniment of Handelian anthems. When the stage lights came on, the panel of past advisers was revealed, seated chronologically.

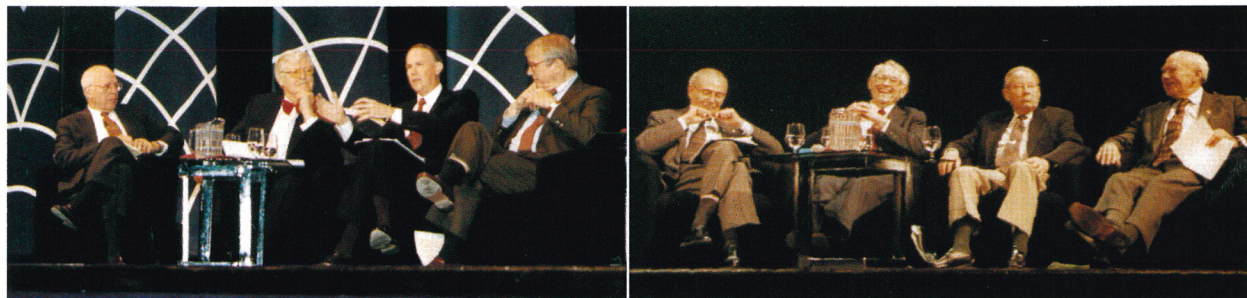
The first speaker was D. Allan Bromley, who had served in George Bush's presidency and had organized the event. Before Bromley introduced his compatriots, he apologized for the absence of the incumbent science adviser, Neal Lane, who "finds himself in the all-too-frequent situation in which the president or vice president has

US government policies and funding for research and development were largely driven by the cold war, Lane added, and "may have shielded science, particularly physics, from a great deal of public scrutiny." Now, he said, "times have changed." Although national defense remains "a major driver of science and technology policy," Lane went on, "we must pay attention to overarching societal goals, including economic growth, education, health care, environment, and our global competitive position." Lane's statement appeared to be a reprise of Lyndon Johnson's remarks, made in public and in private during his presidency in the 1960s, about the need to redirect science research into useful applications.

Though Lane had claimed Killian as the first presidential science adviser, Bromley's introductory remarks reached back into American history to note that Thomas Jefferson "probably had

did draw on the wisdom of a few scientists, beginning with Oliver Buckley, then president of Bell Telephone Laboratories, who provided advice for a time in 1951. Truman also agreed to a committee of scientific and engineering experts, chaired by Buckley. The group of experts was simply called the President's Science Advisory Committee (PSAC), a name that earned respect and stuck for years. Buckley was succeeded by other part-time PSAC chairmen, first Lee DuBridge, Caltech's president, and then I. I. Rabi of Columbia University. But not until the Soviet sputniks circled the Earth did Eisenhower formally introduce science policy into the White House by appointing Killian, an engineer who was president of MIT, as Special Assistant to the President for Science and chairman of PSAC.

It was Lane's immediate predecessor, Jack Gibbons, who set the tone for



TIMES PAST AND TIMES PRESENT: From left to right, Jack Gibbons, Allan Bromley, Bill Graham, Jay Keyworth, Frank Press, Guy Stever, Ed David, and Don Hornig on stage at the American Physical Society's centennial meeting in Atlanta.

other plans for him"—in this instance, a meeting with Russian officials who had come to Washington to discuss subjects ranging from energy and environment to arms control and excess nuclear weapons materials. (The Russian delegation was intended to be the vanguard of a state visit by Prime Minister Yevgeny Primakov, who decided to turn back while flying over the Atlantic when US and NATO forces began bombing the former Yugoslavia.)

In a videotaped message for the symposium, Lane noted that in the years between 1957, when President Eisenhower appointed the first official science adviser, James Killian Jr, in the anxious aftermath of the Soviet sputniks, to 1989, when President Bush selected Bromley, "the job had been shaped by cold-war imperatives."

the best science adviser of all—namely himself." Bromley didn't continue with the historical record, but he could have. Presidents have sought scientific and technical advice, especially in military emergencies. Abraham Lincoln called on Joseph Henry, the first head of the Smithsonian Institution and a physicist, and Alexander Dallas Bache, a geologist who ran the US Coast Survey, for advice on military technology and battlefield surveillance in the Civil War. In World War II, Franklin Roosevelt relied on Vannevar Bush, then director of the Office of Scientific Research and Development, for understanding of and insight on science and engineering issues. Roosevelt's successor, Harry Truman, suspicious of scientists and uneasy among them, dealt at arms length with Bush. But Truman

the APS symposium. Gibbons, who had served President Clinton until last year, evoked laughter from the others on stage when he said: "I enjoyed most of [the job]. It was more challenging than the most challenging physics I ever tried to do."

The challenges confronting President Johnson's adviser, Don Hornig, included, he told the audience, the space program, basic research at universities, and graduate education. But the cold war dominated everything—detecting underground tests and hostile submarines, defending against potential ballistic missile attacks, and, of course, the war in Vietnam.

"Nothing we proposed seemed to make any difference in the war," said Hornig. He recalled that Johnson had once asked him for a memorandum on

a possible followup to the Moon voyage. Within weeks after his memo was submitted to NASA Administrator Jim Webb, the Bureau of the Budget called to complain to Hornig that NASA had assigned nearly 5000 people to come up with a sequel to the Moon landing. Among Hornig's greatest achievements, he said, was the US-Japan Medical Program, a collaboration of health care activities he had quickly concocted after Johnson had directed him, the night before Japan's prime minister was to arrive in 1965, to come up with a good idea.

President Nixon's appointee, Ed David, also was challenged to propose a space mission that would equal President Kennedy's stirring Moon mission. The Nixon administration had already concluded that another trip to the moon or a voyage to Mars, while publicly exciting and industrially challenging, would be too expensive, David told the audience. "The amount of money necessary [for those projects] could produce more benefits in other ways for the country and for science," said David. A more immediate problem, he added, was the "poisonous relationship between the scientific community and the administration over the Vietnam War." It was bound to affect the health of basic research, particularly in the universities, where demonstrations against the war were rampant. David has said on previous occasions that his advocacy of research universities was one of the principal factors in Nixon's eviction of the science adviser and PSAC. On the subject of science funding, David said, "there is almost no answer. There will always be more science and technology to support than there is money to do those things."

For Guy Stever, who served briefly under Nixon and then through Gerald Ford's years, the big challenges were the 1973 oil embargo and escalating environmental problems. "You cannot imagine how much panic and confusion there was in the country and the White House when long lines formed each day at gas stations," he said. Issues of energy, environment and economic growth were coming to the fore. "These are the unfulfilled promissory notes that the period handed to the science and technology community," Stever observed. His greatest frustration, he said, was the breakdown in scientific exchanges with the Soviet Union, due in part to the White House's distraction with Watergate and Nixon's resignation from the presidency. During two trips to the Kremlin, Stever spoke on one occasion to Presidium Chairman Nikolay Podgorny and on the other visit to Premier Alexei Kosygin about scientific and technological exchanges and was told by them that if the programs could be

assured and strengthened, "we will not bother you in the Middle East or Vietnam." But Stever said he could not get the White House to focus on the startling proposal.

President Carter's aide, Frank Press, contended that the science adviser's portfolio "really exceeds" those of the national security adviser and domestic policy adviser "combined." Possibly the most challenging aspect of the job, according to Press, is that "in a politically driven organization, which the White House certainly is, the science adviser can contribute to the success of a president." Press emphasized the two cultures in the White House and provided a case in point: During the 1979 energy crisis, Carter delivered a major speech in which he wanted to announce that by the year 2000 some 20% of US energy would be generated by solar power. Press was sure the prediction was wrong and told the president to reduce or eliminate the figure. "The president disagreed with me and sided with his political advisers and left the percentage stand," said Press. When Press had finished telling the anecdote, Gibbons chimed in: "It was Victor Hugo who said, 'Science has the first word on everything and the last word on nothing.'"

No-win political battles

To Jay Keyworth, President Reagan's first science adviser, the challenges were related to national defense matters, including stealth aircraft and missile basing. "These were complex technical issues that evolved into political rivalries between the National Security Council and the Pentagon," Keyworth recalled. "They were all-consuming, no-win situations that required very different public relations skills than I possessed or was destined to learn." The other challenge was Reagan's decision to launch the Strategic Defense Initiative. "It was frustrating to watch the gradual decline in trust and confidence by Congress and by the academic community," Keyworth said. He also spoke of his impatience with academic scientists who argued that NSF's budget increases, amounting to 18% during four years of the 1980s, were paltry and should be three times the amount the administration proposed.

Reagan's second science adviser, Bill Graham, claimed the president he worked for "had unshakable faith in science and technology for the future of the country. Because of that, he sought to double the NSF budget over a six-year period. We were frustrated by the lack of a committed public constituency. The Superconducting Super Collider was an exquisite case in point. The SSC was started on my watch, but

it didn't take long before one part of the physics community attacked another part, so that Congress, the press and public were never sure who was right," said Graham. He also expressed his frustration over unnecessary turf wars among the agencies. To illustrate this point, he told about a delegation from the Department of Health and Human Services that complained to him about the Department of Energy's human genome program. The program "really belonged in HHS's portfolio," Graham remembered them saying. But Graham defended the DOE scientists as "an ingenious bunch," and said that the National Institutes of Health and DOE should "sit down together, talk it out, and strengthen both genome programs."

With the cold war ended, Bromley's challenges as science adviser centered on economic growth, industrial competitiveness and strengthening research. Among his early actions was the publication in 1990 of the first-ever policy paper on government collaboration with industry in promising generic technologies. This led to establishing the Advanced Technology Program at the National Institute of Standards and Technology, which, ironically, was later opposed by Republicans in the House, though ATP had been conceived in the Republican administration of President Bush.

At various points in the discussion, Gibbons had resonated with other speakers. He had agreed with Press on the wide cultural gap between politicians and scientists, which he likened to "an impedance match" between information and knowledge accumulated by scientists and needs and opportunities grasped by politicians. The discussion illuminated some of the tensions. In his watch, Gibbons explained, "the dominant rationale of the science adviser's office had disappeared, and the job needed a new paradigm."

The science adviser's role has not changed much, though the issues may be different, said Gibbons. With bioethics an emerging issue, Gibbons suggested that Clinton should have a bioethics commission. Clinton agreed, and the commission was finalized just weeks before Dolly, the cloned sheep, was born in Scotland. "You have to be careful what you tell political leaders because the men we serve have a tremendous capacity for absorbing and remembering information," said Gibbons. "The adviser is not an independent expert. He works for the president. The adviser must win the confidence and trust of the president and keep it."

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