

Keyworth Calls for Bold Push in Space

Taking a sharp new tack on the civilian space program, presidential science adviser George A. Keyworth has suggested that the United States consider an ambitious new space initiative in the spirit of the Apollo moon landings—for example, the construction of a manned orbital transfer vehicle to shuttle between low Earth orbit and geosynchronous orbit; a lunar colony; or even a manned expedition to Mars.

Coming from Keyworth, such words are startling indeed. He has been a vocal skeptic of the National Aeronautics and Space Administration's (NASA's) plans for a much less ambitious step, a manned space station (*Science*, 10 September 1982, p. 1018). Moreover, 2 years ago he was defending the White House's attempt to downgrade NASA's unmanned planetary program (much less any *manned* expeditions) on the grounds that a new series of probes would offer less scientific return than, say, space astrophysics (*Science*, 18 December 1981, p. 1322).

However, in a recent interview with *Science*, Keyworth explained his new approach as a matter of national pride. There is now a broad public awareness that the country's future depends on science and technology, he says. Perhaps a new space endeavor could be an appropriate way of sustaining that awareness.

"I think the country would take a major thrust in space very seriously," he says. "We've shown that the shuttle works, and is reliable. We know we have the technology to build a space station. [In fact], most advocates of a space station readily acknowledge that it is only an intermediate step in a more ambitious long-range goal of exploring the solar system. Why, then, can't we be forthright and lay those ideas out on the table? Do we want to tell the American people that we have bold objectives in space? Or do we want to sneak up on it?"

Keyworth maintains that this is perfectly consistent with his previous stance. "I simply said that I would not wax enthusiastic about a large new endeavor until NASA defines what it expects to achieve," he says. In particular, he still wants NASA to fully exploit the capabilities of the shuttle/spacelab combination before it rushes to build a new, permanent laboratory in orbit.

However, his new approach amounts to shifting the emphasis from space station as laboratory to space station as transportation hub. "If you see the space station as the intermediate platform for extended missions [such as a lunar colony or a Mars mission]," he says, "well, it's difficult for me to imagine doing that without a manned station."

Keyworth says his proposals grew out of personal meditations on the national spirit and the space program. He has not yet discussed them with President Reagan, although he does point out that Reagan has long been enthusiastic about space. Nor do his proposals have anything to do with the President's call last 23 March for a space-based, "Star Wars" missile defense. "Stars Wars grew out of strategic considerations," he says. "The two ideas are related only by being in space."

Be that as it may, it is not at all clear what effect Keyworth's ideas will have on official Administration space policy. Of course, Keyworth will now have a tough time opposing NASA's space station in next fall's budget negotiations, if he is still so inclined. And NASA, meanwhile, will doubtless be delighted to start drawing up plans for orbital transfer vehicles, lunar colonies, and Mars missions. But would an Apollo-style initiative necessarily make for a healthy space program?

A nation that can afford the current defense budget can certainly afford a few hundred billion dollars for, say, a manned trip to Mars. But would that trip be purchased at the cost of a more balanced program of space science and near-earth applications? Would it leave NASA in possession of a massively expensive set of hardware that is useless for anything else? Experience with Apollo and the space shuttle is not encouraging. The debate should be interesting.—**M. MITCHELL WALDROP**

was coming from," he recalls. "In October they told us there had been a leak of 100,000 pounds in 1966, and half of it was recovered. That was all." Then Sulkin began hearing rumors that an inventory of all mercury leaks was being declassified. He requested a copy during the winter. Just before DOE released the report in response to a newspaper request on 17 May, an official called Sulkin to warn him to brace himself, for "the number would be large." Indeed it was: not only were 2.4 million pounds of mercury unaccounted for, but 475,000 were thought to have gone down Poplar Creek. Sulkin now says, "There are a lot of other chemicals in that creek—PCBs, acids, organic solvents, plutonium." He wants to look into all of them.

One question the congressional inquiry may wish to examine is why it took so long for this pollution to come to light. The official in charge of environmental monitoring at the Y-12 plant, James White, says that he was most concerned with radionuclides and mercury vapors in the workplace and less with the effects on biota outside. The workers' safety was his first priority. White says that the water in the creek meets federal drinking water standards for mercury, and "there isn't any standard for mercury in soil." As for fish, "We did only a small amount of sampling" in the part of the creek near the Y-12 plant, for "as far as we knew it wasn't fished at all." Most samples were taken further downstream near the Clinch River. More fishing goes on there, and mercury levels are also lower.

The research staff at ORNL does not look into local problems such as this unless invited to do so by peers at the Y-12 or K-25 plants, Auerbach explains. However, the managers of Y-12 did ask for some broad advice on pollution in the mid-1970's. Jerry Elwood, an environmental scientist at ORNL, took a preliminary look at the creeks and recommended in 1977 that an in-depth study be funded to learn the extent of mercury pollution. DOE's chief of environmental protection at Oak Ridge, Jerry Wing, wrote back thanking Elwood for his recommendation and informing him that his paper was being classified "business confidential." The issue lay dormant until December 1981, when Gough began collecting samples on his own.

The early information suggests that the town of Oak Ridge is stuck with a major waste cleanup problem but not one that clearly threatens public health. Sulkin says, however, "We're only one-third through." He has not yet tackled pollution from K-25 and ORNL.

—**ELIOT MARSHALL**