Briefing:

Science Board Study Indicates U.S. Science Healthy

By most measures, the U.S. science and technology enterprise appears to be in good shape, according to the National Science Board's latest statistical portrait of American research and development, *Science Indicators—the 1985 Report.** Total national expenditures on R&D have increased steadily over the past decade, reaching $107 billion in 1985, and the proportion of the nation's gross national product devoted to science and technology has climbed from 2.2 percent in 1978 to an estimated 2.7 percent last year.

"The critical contributions of research and advanced technology development to our international economic competitiveness and to our national security have received clear recognition from both government and industry in recent years," says Roland Schmitt, the NSB chairman, in a letter transmitting the report to the President.

Beneath the overall trends, however, are major structural changes in some areas and a few potential weaknesses in the system. Moreover, the report was put together well before the federal government became obsessed with cutting the federal deficit.

The chief structural change is a major shift toward military R&D and away from civilian science in the past few years. Military R&D is expected to account for 73 percent of total U.S. government R&D expenditures in 1986, up from 49 percent in 1979. As a result, the proportion of the gross national product devoted to nonmilitary R&D has actually declined in recent years, the report notes, and the United States now ranks well behind West Germany and Japan in this measure.

A second notable structural change is that private industry has been increasing its support for R&D at a faster rate than the federal government, and it has overtaken the government as the chief source of R&D funds. Industrial R&D, in fact, expanded steadily in real terms even during the recession in the early 1980's, a period when corporations might have been expected to retrench.

The major areas of potential weakness in the U.S. scientific enterprise are in education, the report suggests. In a chapter on precollege science and mathematics education—the first look at this area in the *Science Indicators* series—the report presents data suggesting that "the average student in the age groups of 13 and 17 years knows comparatively less about [science and technology] than similar students did in earlier periods. . . . It is also worth noting that American high school students take substantially less course work in science and math than their counterparts in other major industrialized countries, and as a matter of fact, fewer courses than their parents about three decades ago."

Among the other data in the report:

- U.S. scientists account for 35 percent of research articles published in the major scientific journals.
- Between 1976 and 1983, employment of scientists and engineers grew three times as rapidly as total U.S. employment. They now account for 3.4 percent of the U.S. work force.
- In the early 1980's, high-technology companies increased their R&D spending by about 9 percent a year, while manufacturing companies in other areas decreased their R&D spending by 0.6 percent per year in constant dollars.
- Almost half the respondents in a recent survey said they were very interested in science, but only 14 percent of the general public and 12 percent of college students considered themselves well informed about scientific issues. ■ COLIN NORMAN

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Superfund Is Running Out of Money

Superfund, the huge federal program to clean up hazardous waste, is fast running out of money and may fall into disarray as a result. Congress has been deadlocked over the future size and scope of Superfund, even though the program's authorization expired in September. Since then, it has been going broke. The start of new cleanup projects already has been delayed at 100 sites around the country, according to the Environmental Protection Agency, which runs Superfund.

The program is supposed to have $900 million for fiscal year 1986. But if Congress does not provide a stopgap measure or reauthorize the program by 31 March, EPA then must terminate dozens of contracts and start a process that could lead to layoffs next fall for the agency's 1500 Superfund employees. "This will have a profound impact," says Linda Fisher, special assistant to EPA administrator Lee Thomas.

Superfund is a young program that has grown fast. Now legislators are trying to get a handle on it and are battling over several issues that would change it. The most contentious among them is how to fund the program. After months of debate, the House finally passed a bill in December that would tax the petroleum and chemical industries, hazardous waste generated by companies, and gasoline at the pump. It would also draw money from general revenues.

The Senate, however, is pushing for a broad tax on manufactured goods without tapping into general revenues. Like the House, it would tax the petroleum industry, but not as much. The House would collect $3 billion, while the Senate wants $210 million from petroleum taxes.

Both chambers want to expand Superfund to a much greater degree than the Administration favors. The House proposes a $10-billion program over 5 years and the Senate is pushing for $7 billion. The Administration wants to cap it at $5 billion.

There are other differences between the two bills. The House version imposes on EPA many more deadlines for cleanup, while the Senate would give the agency flexibility. The House would set aside $1.2 billion for the cleanup of leaking underground storage tanks, a measure not contained in the Senate version.

There has been growing support lately for a temporary bailout of Superfund, such as a 1-year extension of the old program. Even EPA, which has rejected that option in the past, now says it would reluctantly accept this alternative. EPA and others, such as Representative John Dingell (D–MI), chairman of the House Energy and Commerce Committee, are worried that passage of a temporary remedy will take the pressure off Congress to grapple with the tough decisions involving reauthorization. Thomas said last week that Congress "has to work on the long-term and short-term solutions. We need to ensure stability of this program."

According to Blake Early, a spokesman for Sierra Club, cleanup efforts would be seriously disrupted if contracts have to be terminated and then renegotiated if and when Superfund is reauthorized. Without assurance of stable funding over the next year, EPA employees, faced with uncertainty, may decide to look for other jobs even though they may not be laid off until next fall. Early notes that if Congress does not reauthorize Superfund this session, legislators will have to start the whole process over again next fall when a new session begins, causing more delay.

The House and Senate selected conferees on 6 February, but have not scheduled a meeting. One congressional aide declined to speculate what would happen. Superfund "is being jerked back and forth," the aide said. ■ MARJORIE SUN