Critical Materials Imports Vulnerable, OTA Warns

A new study by the congressional Office of Technology Assessment (OTA)* indicates, without saying so explicitly, that the United States is likely to become more dependent on imports of critical materials from potentially insecure sources of supply. The study offers some suggestions to help develop alternative supplies or promote the use of substitutes, but few of these measures would have much impact in the near term and many would be anathema to the free-market philosophy of the Reagan Administration.

The report focuses on four materials, chromium, cobalt, manganese, and platinum group metals, production of which is concentrated in southern Africa and the Soviet Union. All four materials have critical industrial uses ranging from producing alloys to catalyzing chemical reactions.

The United States currently imports well over $1 billion worth of these materials per year, the study notes, and with the possible exception of manganese, their use is expected to increase substantially over the next few years. For example, U.S. demand for chromium and platinum group metals is likely to double by the end of the century.

These trends suggest that the United States could become increasingly dependent on one or two suppliers and thus be more and more vulnerable to a disruption of imports.

One possible way to reduce potential vulnerability would be to create an industrial stockpile of critical materials, but industry is skeptical that such a stockpile could be managed without disrupting the market. (A stockpile of strategic materials, first established in 1939, is maintained by the U.S. government to meet military and other critical needs in times of war or declared national emergency, but it cannot be used to meet industrial or civilian needs if supplies are disrupted by economic events or foreign political disturbances.)

A second approach would be to encourage diversification of supplies, substitution of alternative materials, and recycling of strategic metals from waste and scrap. The OTA study found that this approach is technologically feasible and could, in theory, help reduce future dependence on potentially insecure sources of supply.

The problem, however, is that market forces are currently pushing in the direction of increased imports from existing suppliers because materials from these sources are relatively cheap and abundant. The OTA study therefore suggests that some government action is needed if vulnerability to supply disruptions is to be reduced. It suggests measures ranging from better dissemination of information to direct financial assistance to industry for investments in new technologies.

Measures that entail substantial government involvement in steering private investments are, however, sure to be resisted by the Reagan Administration. Indeed, the OTA report notes that the Administration has not even carried out requirements of various pieces of legislation to produce reports on potential disruptions in supplies of critical materials. In general, the Administration prefers to rely on the workings of the market to deal with such matters.

There is some historical justification for such an approach. Four previous supply disruptions—a halt in chromium and manganese exports by the Soviet Union in 1949, a boycott of chromium ore from Southern Rhodesia in the 1960's, an interruption of nickel imports from Canada in 1969 because of a strike, and disruptions in cobalt exports from Zaire during recent political disturbances—all resulted in shifts in patterns of supply or new technological developments. The OTA study notes, however, that some of these disruptions had serious financial impacts, and it suggests that adjustments may be more difficult next time around.

One interesting footnote in the discussion of critical materials is the almost complete disappearance of ocean mining from the future resource picture. Just a few years ago, minerals from the ocean, particularly manganese nodules on the floor of the Pacific Ocean, were widely regarded as offering a potential abundance of several critical materials. However, the OTA study notes that a sharp escalation in estimated costs of ocean mining, coupled with depressed prices of conventional supplies and legal uncertainties caused by the United States' refusal to sign the Law of the Sea agreement, have placed these resources beyond reach, at least for the foreseeable future.

—COLIN NORMAN

*Summaries of the report, "Strategic Materials: Technologies to Reduce U.S. Import Vulnerability," are available from the Office of Technology Assessment, Washington, D.C. 20510; the full study will be published in March.

A New U.S.–Soviet Manned Space Mission?

The Reagan Administration appears ready to initiate formal discussions with the Soviet Union on the possibility of a joint U.S.–Soviet manned space mission. Such a mission would have clear symbolic value as a token of better relations between the two countries, especially now that they have agreed to include President Reagan's "Star Wars" strategic defense initiative in a new round of arms control negotiations. If all goes smoothly, the flight could take place before the end of 1985.

At this point it is still not clear whether the Soviets will agree to discuss a space mission. However, insiders at the National Aeronautics and Space Administration (NASA) say they have been led to believe that a joint space mission was one item on the agenda last week when Secretary of State George P. Shultz met with Soviet Foreign Minister Andrei A. Gromyko in Geneva. On 5 January, moreover, the magazine *Aviation Week and Space Technology* reported that the Administration planned to begin formal talks on a joint mission "as early as this week." And on 7 January, the day the Geneva talks began, White House deputy press secretary Larry M. Speakes called the NASA news office and told officials there that if anyone asked, the *Aviation Week* story "is substantially correct."

Meanwhile, NASA officials have been discussing what might be done on a joint mission. In one concept, the U.S. space shuttle would approach the Soviet Union's Salyut 7 space station, and an astronaut would use a manned maneuvering unit—the Buck Rogers backpack—to cross the gap. He or she could then work with the Soviet cosmonauts to demonstrate rescue techniques.

Of the shuttle missions currently planned for 1985, three will be in high inclination orbits that can match the Salyut. However, all three are Spacelab flights, and for technical reasons none of them is particularly suited to a Salyut rendezvous. On the other hand, the first launch of a shuttle from California's Vandenberg Air Force Base has now been postponed until early 1986, leaving a gap in the shuttle manifest that could be filled by a dedicated Salyut rendezvous mission.—**M. Mitchell Waldrop**

Medical Institute to Sell Hughes Aircraft

Trustees of the Howard Hughes Medical Institute, one of the largest private funders of medical research in the United States, decided on 10 January to put the Hughes Aircraft Company up for sale. The institute, which owns the giant electronics and aerospace company, could emerge from the sale with cash assets rivaling those of the Ford Foundation—the nation's largest foundation—and it may be required to sharply increase its outlays on research.

The institute was established by Howard Hughes in 1953 in part to provide a tax shelter for the company's profits. Its management was in dispute for many years after Hughes, who was the sole trustee, died in 1976. Last year, a Delaware court settled the matter by appointing a nine-member board to run the institute and decide what to do with the company.

One of the board's tasks has been to increase the funds flowing into research. It is required by tax law to spend an amount equivalent to 3.5 percent of its assets on research, but in spite of the fact that Hughes Aircraft—its only asset—had revenues of almost $5 billion in 1983, the institute spent only $51 million on research that year. It increased its research spending to $80 million last year.

Last September, the board asked Morgan Stanley and Company to investigate the pros and cons of selling Hughes Aircraft, and at its January meeting, it decided to go ahead either with an outright sale or a public offering. The institute would then become an independent medical research organization.

"We don't know what the result will be," says board president Donald Fredrickson, who is a former director of the National Institutes of Health. Industry analysts speculate, however, that the company will probably fetch between $3 billion and $4 billion. If so, the institute would be required to spend $105 million to $140 million a year on research. Fredrickson says there are no plans to depart from the current practice of funding a network of institutes on university campuses.

One unresolved question is whether the institute will eventually change its status from a medical research organization to a foundation. Such a switch, which has at times been pushed by the Internal Revenue Service, would require the organization to spend an amount equivalent to 5 percent of its assets each year. Fredrickson says the board is studying the matter, but is not currently planning to change.—**Colin Norman**

Louisiana Judge Voids Creationism Law

Louisiana's balanced treatment act, which mandates equal teaching of so-called creation science and evolution in the state's public schools, has been ruled unconstitutional on First Amendment grounds by Federal judge Adrian Duplantier. The ruling, delivered in New Orleans on 10 January, was in response to a motion for summary judgment filed in September by the American Civil Liberties Union, which has been representing the law's critics in the tortuous legal wrangles that followed its enactment in July 1981.

Although the Louisiana creationism law had been deliberately drafted in somewhat vaguer terms than the version that was struck from Arkansas's statute book in January 1982 in an attempt to make it less vulnerable to legal challenge, Judge Duplantier's reasoning parallels precisely the Arkansas decision. "Because it [the state's balanced treatment law] promotes the beliefs of some theistic sects to the detriment of others, the statute violates the fundamental First Amendment principle . . . that a state must be neutral in its treatment of religions," ruled Duplantier. Creationism, as incorporated in the balanced treatment law, was religion, not science, he added.

The law's supporters had filed more than 1000 pages of discussion in its defense, much of which focused on what exactly science is. Duplantier's response to this was blunt: "We decline the invitation to judge that debate." The state's attorney general, William Guste, says he will appeal Duplantier's decision and therefore hopes that a judge on the Fifth U.S. Circuit can be persuaded of the value of such a debate.—**Roger Lewin**

Academy to Reopen Soviet Exchange Program

The National Academy of Sciences (NAS) has decided to try to reopen a formal U.S.–Soviet scientific exchange program, after a 4-year suspension. Toward that end, Frank Press, the Academy's president, will meet in Moscow on 21–22 January with a delegation from the Soviet Academy of Sciences, headed by A. P. Alexandrov, its president.

There, he will discuss a new umbrella agreement under which the academies might jointly sponsor scientific symposia. Prior to the suspension of the last agreement in 1980, after the Soviet Union sentenced Andrei Sakharov to internal exile, roughly three such symposia were held each year, each involving a dozen or so scholars. A portion of the agreement, under which the two academies help organize exchanges of individual scientists, has been observed informally for several years and is unlikely to be affected by the new negotiations.

A senior NAS official says that a major goal of the talks will be to ensure that the Soviet Union allows its most eminent scientists to participate in future symposia, so that the research establishments of both nations can benefit. "We're particularly interested in those areas where world-class research is clearly going on, such as mathematics," the official said. Hans Frauenfelder, a director of the NAS physics section, and Alexander Rich, a biochemist from MIT, are among those to accompany Press on the trip.—**R. Jeffrey Smith**