

Getting Serious About Strategic Minerals

Interior seeks to establish government-wide policy; environmentalists fear mineral raids on public lands

Under the leadership of Secretary of the Interior James Watt, the government is gearing up to pursue a coherent strategic minerals policy. This entails renewed attention to the mining and acquisition of minerals judged crucial to the country's military and industrial base. It also involves plans to make public lands more accessible to mining, and environmentalists fear that lands currently protected for their wilderness value are going to be thrown open to mining under the banner of "national security."

There is no question that the Reagan Administration is more interested in minerals policy than any other Administration has been for years. The GOP campaign platform stated that it would be necessary to "remove impediments to greater development of domestic resources." Watt, at his confirmation hearing, disclosed that he wanted his chief legacy to the department to be the bolstering of the strategic minerals reserve. And the Heritage Foundation, the conservative think tank that the Reagan people rely so much on, has written of the "impending minerals crisis" as being "potentially more destructive to this country's national security than our excessive dependence upon foreign oil imports."

Now moves are afoot to replenish the country's strategic materials stockpile, revitalize mining, and inject minerals consideration into every conceivably relevant aspect of domestic and foreign policy.

On 13 March the Federal Emergency Management Agency announced that the government would be spending \$100 million as the first part of an acquisition program to build the stockpile from about \$15 billion worth of minerals and materials to a store worth well over \$18 billion. The main item will be the purchase of 1.2 million pounds or \$25 million worth of cobalt.

The stockpile currently lists desired quantities for 93 materials, 80 of them minerals. The amounts are those estimated to be needed for a war of 3 years' duration. Of the 42 most critical minerals, the United States is dependent on foreign sources for more than 50 percent

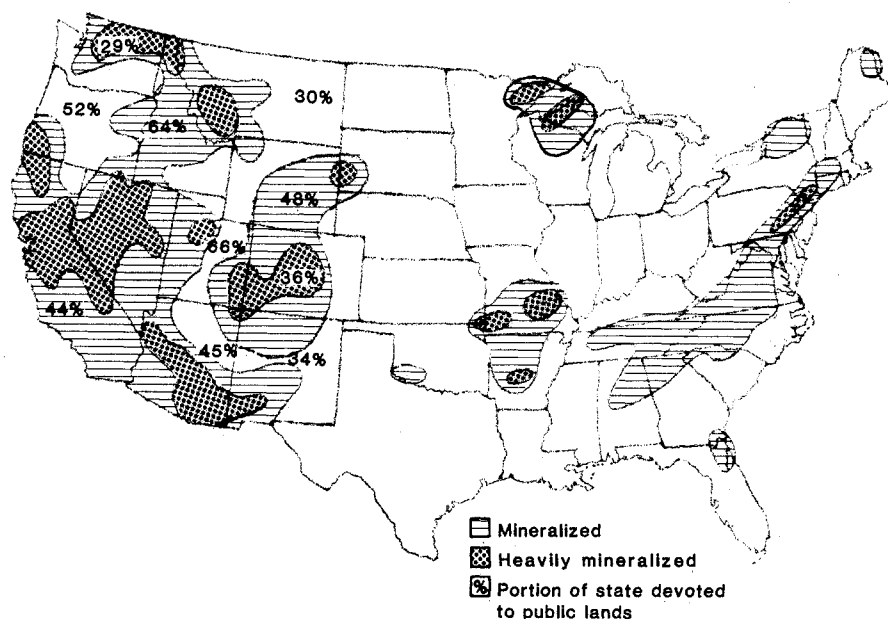
of 24 of them. Of all the minerals in the stockpile, the greatest attention is accorded five: cobalt, chromium, manganese, platinum group metals, and titanium. Over the past decade there has been growing concern about the Soviet Union's attempts to move in on mineral-rich areas of the world. Zaire, which with Zambia supplies two-thirds of the world's cobalt, is commonly cited as an example. (In 1978, troops from Angola invaded Zaire's cobalt-producing Shaba province, which quadrupled the price of cobalt, just after the Soviet Union had made large purchases.) There have also been warnings that mineral-rich countries will form OPEC-style cartels, although experts generally regard this as unlikely.

Estimates of the severity of the impending minerals crisis vary widely. The most prominent raiser of the alarm has been Representative James Santini (D-Nev.), chairman of the subcommittee on mines and mining of the House Interior and Insular Affairs Committee. Santini does not believe it is possible to overestimate the danger of a shortage. For example, he has said that "a chrome embargo by the Soviet Union and Zimbabwe would bring the entire industrial world to

its knees in just 6 months." He wants a new Cabinet-level department for minerals and materials and is sponsoring a National Minerals Security Act to ease the effects of environmental and antitrust laws on the mining industry.

There is some flexibility in the need for these metals if possibilities for conservation or substitution are followed up. For example, in some magnets cobalt can be replaced by aluminum and nickel. George Economos of the National Academy of Sciences (NAS) Materials Advisory Board warns, though, that substitution is no quick matter. It would take about 5 years, he says, to prove a cobalt substitute in a jet engine.

Recycling is another practice that could be used more extensively. There is little recycling of manganese, chromium, or cobalt, although there are good possibilities for chromium. There is not agreement on the extent to which conservation can solve the problems. An NAS study in 1976 claimed that the nation could save one-third of the chrome used annually with little or no discomfort, but the men in the energy and minerals office of the Interior Department say that the prospect of gas rationing "pales in comparison" to what would happen if nones-



sential uses of chrome were dispensed with.

There is also disagreement on the primary causes of the decline in mining and smelting over the last decade. Some analysts, such as Hans Landsberg of Resources for the Future (RFF), explain that most of the cream has been skimmed and the low-grade ores that remain are too costly to mine. The mining industry is more prone to ascribe problems to environmental regulations (particularly, in the case of smelting, the Clean Air Act) and the unpredictability of the government, which has discouraged companies from risking new ventures in wilderness areas.

Nor is there any uniform estimate of the country's potential mineral resources. The view of the people at Interi-

or—which coincides with that of the American Mining Congress—is that we still have only the vaguest idea where America's remaining mineral wealth lies. Perry Pendley, a former Capitol Hill staffer brought in by Watt, says we face the likelihood of a "minerals shock" very like the oil shock unless mining concerns are allowed freer access to public lands and more flexible regulation.

According to John Morgan, chief staff officer at the Bureau of Mines, however, if the concern were solely about the strategic stockpile, public lands policy would not be much affected. He believes domestic production of "certain highly strategic materials which are clearly deficient in the nation's strategic stockpile" should be stimulated. That about boils

down to cobalt—and Congress has already exempted from wilderness classification land containing potential cobalt deposits near the Blackbird mine in Idaho—and platinum, which is already being investigated at the Stillwater mining complex in Montana. Morgan says it would not be cost-effective to exploit chrome resources unless the price went up drastically, that it is only more refining facilities that are needed for titanium, and that there is no manganese worth mining in the country. The chief action required to stimulate mining, he feels, is congressional renewal of the Defense Production Act, due to expire at the end of September, which provides for government-guaranteed pricing of strategic minerals.

But building up the stockpile is only a part of what a new minerals policy entails. As Watt said in testimony before the Senate energy and mineral resources subcommittee, "a national strategic minerals policy involves . . . the follow-through of a strategy that protects American jobs and investments, improves our balance of trade, revitalizes the nation's economy, and provides for the security of foreign mineral imports." The first step in this strategy is to make public lands more accessible to mining. According to Interior's figures, 70 percent of public lands "are encumbered by some degree of restriction inhibiting access" by mining. The Wilderness Act of 1964 permits staking of claims until the end of 1983, but mining in wilderness areas is circumscribed by requirements that their wilderness characteristics not be violated. Watt wants to add another 20 years to the deadline for staking new claims. He has not made any other specific recommendations for amending the Wilderness Act, but he has frequently stated publicly that he opposes the "single use" designation for federal lands and favors extension of the "multiple use" concept to everything but national parks. Thus it can be inferred that he wants mining at least on equal footing with wilderness in wilderness areas. Watt also intends to take administrative measures to "release" to multiple use 24 million acres of land managed by the Bureau of Land Management that has been studied and deemed unsuitable for wilderness designation. He also favors release of 36 million acres that are covered by the Forest Service's roadless area review and evaluation program. (The Mountain States Legal Foundation, which Watt used to head, filed a lawsuit to that end in 1979.)

Environmentalists could scarcely agree less with Watt on the reasons for

Critical Minerals

The following five minerals generally receive the most attention when talk turns to strategic minerals.

Cobalt. Vital to the aerospace industry, cobalt is subject to problems that make it top the list of vital and vulnerable materials. It is 93 percent imported, mostly from Zaire and Zambia. U.S. cobalt production began to decline in the 1960's and fell to zero in 1972. Meanwhile, consumption has climbed to 20 million pounds a year. The stockpile, which is supposed to contain 85 million pounds, has only 41 million. Disruptions in Zaire caused the price to quadruple in 1978. Cobalt is needed primarily for high-temperature alloys in jet engines; it is also used in magnets and in cement mixtures of tungsten chloride, which make extremely tough drilling bits and cutting edges.

Chromium. Used in far greater bulk than cobalt, mainly in stainless steel, chrome confers corrosion resistance and hardness at relatively low cost. It also has critical uses in the hot parts of airplane engines and in petroleum refining, cutting tools, and drill bits. The United States imports 91 percent of its chromium, mostly from South Africa and Zimbabwe Rhodesia. Domestic production has contracted, as it became noncompetitive when South Africa developed a process for decarburization of its low-quality ore.

Manganese. It is essential for making steel. There is no commercially exploitable manganese in the United States. Again, South Africa is the chief supplier. The stockpile of manganese is 100 percent filled and there are other sources of supply, including Australia, Brazil, and Gabon, not to mention the much-talked-about potato-sized nodules at the bottom of the ocean, which also contain cobalt and nickel.

Platinum. Metals in the platinum group, which includes palladium, rhodium, osmium, iridium, and ruthenium, are mainly imported from the Soviet Union and South Africa; hence they are regarded as vulnerable. Only 13 percent is supplied domestically, through recycling. Platinum, of which 3 million ounces a year is used, is employed for antipollution catalysts in automobiles, in oil and chemical refining, and in high-temperature processing of glass.

Titanium. Rutile, the ore from which titanium is processed, comes mostly from Australia. Ninety percent of titanium is used to make nontoxic white paint. It is twice as heavy and six times as strong as aluminum and is corrosion-resistant. Only 17 percent of the titanium sponge (semiprocessed ore) required for the stockpile is in place. The stockpile goal has been revised upward from 130,000 to 195,000 tons. If necessary, titanium can be produced from the domestic low-grade ore ilmenite.—C. H.

the minerals problem or the proposed solutions. In the first place, according to Tim Mahoney of the Sierra Club, only one-fourth of public lands—mainly parks and military reservations—are closed to mining. Although miners claim that costly and burdensome regulations are what prevent them from going into wilderness areas, Mahoney maintains that all the areas with a significant mineral potential were excluded by Congress from protection when the wilderness areas were designated.

Miners and environmentalists also differ on the degree to which our mineral resources are known. The latter contend that no big surprises await explorers, the former that we still "don't know what's out there" until we do some digging. As improving technology and rising prices make the mining of lower and lower grades of ores feasible and cost-effective, our reserves are not only not shrinking,

they are expanding, miners contend.

Directly linking mining to national security affords a powerful lever to those who want to open more public lands for exploration. Watt and his allies believe that increased self-sufficiency in minerals means more security, more jobs, and an improved balance of payments. Economic arguments are not so often heard on the other side. For instance, Landsberg of RFF warns that "this current wave could lead us the wrong way." That is, if everyone buys the idea that foreign supplies may be jeopardized by a Russian "resource war" against the United States, this country may embark on a program that is needlessly costly—in terms of both money and environment—to become more self-sufficient. Furthermore, we could prematurely deplete domestic supplies that might better be saved for the day when foreign supplies are no longer available.

Even before the last election, Congress was getting into the mood to do more about strategic minerals. Last year it passed the National Materials and Minerals Policy, Research and Development Act of 1980, which reiterates the intent of a law passed 10 years earlier. The law, which basically tells the government to organize a minerals policy and encourage private enterprise, did not have any money attached to it, and its intent was pretty much submerged under specific legislation passed in the 1970's.

The public mood is riper now than it was 10 years ago. Corporate America has noticed the trend, and oil companies are starting to buy up minerals concerns. The obvious danger is that, with strategic minerals finally getting some long-sought attention, restrictions on mining in public lands may be put aside in the name of national security.

—CONSTANCE HOLDEN

Ethical Risks in Biomedicine

Theologian Richard McCormick maps areas where science may be asked to yield to moral values

Richard McCormick, S.J., a moral philosopher at the Kennedy Institute of Ethics, Georgetown University, recently published a book of essays on dilemmas created by new medical technology. *How Brave a New World?*,* which is Catholic without being the word of the Church, is an attempt to bring established theological wisdom to bear on technical issues and to find compromises where doctrine and scientific interest clash. It may serve as a guide to moral attitudes that will dominate the federal health establishment in a conservative era.

McCormick has had an influence on policy himself. He is consulted from time to time by federal policy-makers caught in medical quandaries, and he has advised litigants in such difficult trials as the one which gave the parents of comatose Karen Ann Quinlan the right to disconnect her life-support equipment. (McCormick advised in favor of unplugging it.) McCormick also served on the government's short-lived Ethics Advisory Board. It was created by Joseph Califano, former secretary of the agency then known as Health, Education, and Welfare (HEW), now Health and Human Services (HHS).

In his own new book (see *Science*, 10 April), Califano refers to McCormick as "an ethicist well versed in the abortion controversy." Califano tells how he telephoned the theologian early in 1977 just minutes before he had to face his Senate confirmation hearing. He wanted to know whether he could remain faithful to his Catholic convictions and at the same time administer an agency that paid for abortions through Medicaid. McCormick reassured the worried secretary-to-be that he could distinguish between personal beliefs and public duty in good conscience and administer the law as written. The advice helped Califano respond to a grilling by Senator Mark Hatfield (R-Ore.).

Few institutions endure in Washington. Califano, the Ethics Board, and HEW are gone from government. But the work of the Ethics Board survives in the form of a list of recommendations to HEW on how to deal with proposals for research on human embryos created in the laboratory. One of the rules the board suggested with regard to in vitro fertilization said that research could go forward on embryos created in the lab, provided they not be kept alive more

*Doubleday & Co., New York, 1981.

than 14 days after fertilization. After that they presumably become too human to be considered research material. If the embryos are to be kept alive and transferred to a mother for gestation, the board said the embryos would have to come from the sperm and ovum of a lawfully married couple. There were many other suggested rules, none of which has been put into effect.

Although the Ethics Board spelled out its decisions in some detail, not much has come of its work. For one thing, the board has been superseded by a new authority, the Presidential Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, born of legislation introduced by Senator Edward Kennedy (D-Mass.). The new commission has a larger territory and a vaguer purpose than the board did. No one is required to heed its advice, whereas under the old system the Secretary of HEW was expected to respond. Second, this experiment in moral government has faltered because the work of the old Ethics Board has not yet found a secretary of HEW or HHS willing to endorse it. Califano ignored it. Patricia Harris asked for more comment. And now President Reagan's HHS sec-