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# THE RESOURCE WAR

## EARTH

By Susan Mazur

Imagine the world as a board game. The object of the game—call it "The Resource War"—is to secure for the United States enough minerals to satisfy the industrial and military needs of the nation. The rules of the game dictate that mineral consumption has skyrocketed, and to meet the lifetime needs of the population, the availability of vital metals must be doubled. Vast amounts of strategic minerals must now be purchased from foreign sources to keep television sets working, cars rolling off assembly lines, and the military up-to-date.

On the first turn, to manufacture missile-guidance systems and jet engines, the United States purchases 71 percent of its cobalt from southern Africa. On the next round, it turns to South Africa for 49 percent of its chromium, a metal essential to the building and automotive industries. On the third turn, the United States buys more than half of its platinum—used by farmers for fertilizer—also from South Africa, and another 25 percent from the USSR.

The "game" is already being played; the

United States has taken these turns—and the contest is lopsided. In fact, the United States currently imports from 50 to 100 percent of two dozen strategic metals for its total needs. And given the unequal distribution of these raw materials and the slim chances for a new deal, some players on the American side want to adopt a different playing strategy.

"Wittingly or unwittingly," says Allen Overton, president of the American Mining Congress, "the United States is cutting the very arteries and sinews of our national security and placing the survival of our nation into the hands of unstable foreign regimes, subject to all the vicissitudes of the modern age."

Consider the following scenario: General Mobutu Sese Seko has just been ousted as President of Zaire—our principal supplier of cobalt—in a Marxist-inspired coup. The new regime decides to suspend all shipments of cobalt to the United States until we break relations with the white-ruled government in South Africa. Zambia seizes the opportunity to apply added pressure on

the United States to oppose South Africa's racist policies and also cuts off shipments of cobalt. We have now lost 71 percent of this strategic metal, sending the stock market and the economy into a tailspin. Acting on a recommendation contained in an August 1980 report to Congress by the Subcommittee on Mines and Mining, the President of the United States turns to contingency plans: He assumes full economic-mobilization powers and orders conservation measures, recycling, and private access to government stockpiles.

"These alternatives cannot wait for the last minute," Marc Fasteau, staff director of a Rockefeller-sponsored commission to study American dependence on African mineral resources, warns. "They all require careful and detailed planning."

Already in the process of the biggest military buildup since World War II, the General Services Administration is stockpiling 15 strategic metals at a cost of \$100 million to the taxpayer.

But should these stockpiles be depleted and the other contingency plans prove ineffectual, where could we turn for these critical metals? Since the Soviet Union is self-sufficient in the key minerals we must import, the United States could find itself at the mercy of the Russians with their stock of minerals.

The Russians are adding to these supplies daily, like an aggressive Monopoly player. For example, according to James Santini, chairman of the House Subcommittee on Mines and Mining, the USSR is secretly stockpiling vanadium. The Russians control 29 percent of the world's supply of this metal, used in the production of structural steel.

Titanium is another metal the USSR is hoarding; 38 percent of the world's supply lies within the Soviet Union's boundaries. Since titanium is one-quarter lighter than steel, and four times as strong, it is invaluable in the manufacture of aircraft and submarines.

The USSR is also busily purchasing large quantities of beryllium from Zambia, which is a political ally of the Soviet Union. Because of the metal's resistance to temperatures up to 1,000°C, beryllium is



Forging steel without chromium is America's next objective in the battle for mineral self-reliance.

really are. Deception is always ugly."

He reached for her hand. It had six fingers, very long and narrow, without fingernails or visible joints. Her skin was silky and faintly glossy, and it felt not at all as he had expected. He ran his hands lightly over her slim, virtually fleshless body. She was altogether motionless.

"I should go now," she said at last.

"Stay with me. Live here with me."

"Even now?"

"Even now. In your true form."

"You still want me?"

"Very much," he said. "Will you stay?"

She said, "When I first came to you, it was to watch you, to study you, to play with you, perhaps even to mock and hurt you. You are the enemy, Therion. Your kind must always be the enemy. But as we began to live together, I saw there was no reason to hate you. Not you, you as a special individual, do you understand?"

It was the voice of Sarise coming from those alien lips. *How strange!* he thought. *How much like a dream!*

She said, "I began to want to be with you. To make the game go on forever. But the game had to end. And yet I still want to be with you."

"Then stay, Sarise."

"Only if you truly want me."

"I've told you that."

"I don't horrify you?"

"No."

"Paint me again, Therion. Show me with a painting. Show me love on the canvas, Therion, and then I'll stay."

He painted her day after day, until he had used every canvas, and hung them all about the interior of the cabin. Sarise and the dwikka tree, Sarise in the meadow, Sarise against the milky fog of evening, Sarise at twilight, green against purple. There was no way he could prepare more canvases, although he tried. It did not really matter. They began to go on long voyages of exploration together, down one stream and another, into distant parts of the forest, and she showed him new trees and flowers, and the creatures of the jungle, the toothy lizards and the burrowing golden worms and the sinister, ponderous amorfibots sleeping away their days in muddy lakes. They said little to one another; the time for answering questions was over and words were no longer needed.

Day slipped into day, week into week, and in this land of no seasons it was difficult to measure the passing of time. Perhaps a month went by, perhaps six. They encountered no one else. The jungle was full of Metamorphs, she told him, but they were keeping their distance, and she hoped they would leave them alone forever.

One afternoon of steady drizzle he went out to check his traps, and when he returned an hour later, he knew at once that something was wrong. As he approached the cabin, four Metamorphs emerged. He felt sure that one was Sarise, but he could not tell which one. "Wait!" he cried as they moved past him. He ran after them. "What

do you want with her? Let her go! Sarise? Sarise? Who are they? What do they want?"

For just an instant one of the Metamorphs flickered, and he saw the girl with the auburn hair, but only for an instant; then there were four Metamorphs again, gliding like ghosts toward the depths of the jungle. The rain grew more intense, and a heavy fog bank drifted in, cutting off all visibility. Nismile paused at the edge of the clearing, straining desperately for sounds over the patter of the rain and the loud throb of the stream. He imagined he heard weeping; he thought he heard a cry of pain, but it might have been any other sort of forest sound. There was no hope of following the Metamorphs into that impenetrable zone of thick, white mist.

He never saw Sarise again, or any other Metamorph. For a while he hoped he would come upon Shapeshifters in the forest and be slain by them with their little polished dirks, for the loneliness was intolerable now. But that did not happen, and when it became obvious that he was living in a sort of quarantine, cut off not only from Sarise—if she was still alive—but from the entire society of the Metamorph folk, he found himself unable to dwell in the clearing beside the stream any longer. He rolled up his paintings of Sarise and carefully dismantled his cabin and began the long and perilous journey back to civilization.

It was a week before his fiftieth birthday when he reached the borders of Castle Mount. In his absence, he discovered, Lord Thraym had become Pontifex, and the new Coronal was Lord Vildivar, a man of little sympathy for the arts. Nismile rented a studio on the riverbank at Stee and began to paint again. He worked only from memory: dark and disturbing scenes of jungle life, often showing Metamorphs lurking in the middle distance. It was not the sort of work likely to be popular on the cheerful and airy world of Majjipoor, and Nismile found few buyers at first. But in time his paintings caught the fancy of the Duke of Qurain, who had begun to weary of sunny serenity and perfect proportion. Under the Duke's patronage, Nismile's work grew fashionable, and in the later years of his life there was a ready market for everything he produced.

He was widely imitated, though never successfully, and he was the subject of many critical essays and biographical studies. "Your paintings are so turbulent and strange," one scholar said to him. "Have you devised some method of working from dreams?"

"I work only from memory," said Nismile.

"From painful memory, I would be so bold as to venture."

"Not at all," answered Nismile. "All my work is intended to help me recapture a time of joy, a time of love, the happiest and most precious moment of my life." He stared past the questioner into distant mists, thick and soft as wool, that swirled through clumps of tall, slender trees bound by a tangled network of vines. ∞

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especially useful for the manufacture of rocket nose cones. It is clear that in "The Resource War," the Russians are winning.

To tighten their stranglehold on the world's mineral resources, the Russians are strengthening their alliances in southern Africa. While the United States keeps a low profile, Soviet economic and technical cooperation in Africa is at an all-time high. The Russians are staffing the mining faculties of African universities. They also conduct surveys of the provinces and, with the mining equipment that they donate, assist in prospecting.

Dr. Eli Mwanang'onze, director of Zambia's Geological Survey, perceives the Soviet presence in his country as "humanitarian." Dr. Mwanang'onze, who studied geology at the Leningrad Institute of Mining, welcomes Soviet assistance "to help us fight colonialism and sustain our independence, which is being gnawed away by American activities." The Russians, it seems, are also winning the propaganda war in Africa.

A promising solution to long-term mineral supply is provided by the collaboration of the American government and private U.S. industries to develop "synterials." Westinghouse is working on eight synterials to replace strategic metals. Another pioneer in this field is United Technologies' Pratt and Whitney Division, with a process called Rapid Solidification Rate (RSR). RSR is used to make stainless steel without chromium. Instead, iron is alloyed with aluminum, titanium, and boron. It's then heated until molten, spun and fragmented at 25,000 rpm, and frozen into a powder. The new metal, 20 percent less dense than steel containing chromium and able to withstand greater temperatures, is remelted to be used in jet-engine parts.

The National Aeronautics and Space Administration, too, has initiated programs to find substitutes for vital metals. Through its Conservation Strategic Aerospace Materials Program (COSAM), laboratories at Columbia University, Case Western Reserve, and Purdue are experimenting with ways to replace cobalt in aerospace machinery. John Tien, who manages COSAM at Columbia, says cobalt is used in about 10 to 20 percent of aerospace parts. But studies indicate that cobalt can be replaced by nickel-based alloys.

With the political wild card lurking somewhere in the deck, reports like the Rockefeller-funded "South Africa: Time Running Out" recommend an increased U.S. stockpiling of industrial minerals, particularly chromium and manganese. Our failure to stockpile, the report warns, will end "The Resource Game." There will be greater Soviet influence in those countries bordering on South Africa and a dangerous shortage of vital mineral resources here at home. ∞