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THE LOS ANGELES TIMES - FEBRUARY 13, 1981

# Soviet Union Is on the Move

## It Fights Western Control of Strategic Raw Materials

By DANIEL S. MARIASCHIN

As the West fixes its attention on oil and the energy crisis, that crisis is serving as a diversion for the Soviets, who are engaged in a two-pronged, two-continent offensive whose goal is to neutralize Western control of, and access to, strategic raw materials.

Viewed in that context, reports that the Soviet Union is planning to back new efforts to destabilize the political status quo in Zaire should be noted by the West with more than passing interest. Controlling that country's Shaba province, which provides the bulk of the free world's cobalt, has been a strategic objective of Moscow's surrogates for nearly two decades. Western military intervention checked the most recent try at wresting this vital territory from Zaire three years ago after an uprising by Angolan- and Cuban-backed "Shaban rebels."

Whether this latest attempt to overthrow the government of Mobutu Sese Seko will succeed remains to be seen. What is clear is that the Kremlin's moves to encircle the West's sources of raw materials, including oil, is well on its way to fruition. Soviet influence in the Middle East and Persian Gulf is growing daily in a ring around the oil fields and vital shipping lanes of the region.

Through its presence in Ethiopia, the Soviet Union has near-control of the Horn of Africa, a foothold on the Red Sea by its backing of the Marxist government in South Yemen, and a solid presence—through arms shipments and the stationing of military "advisers"—in Syria, Iraq and even the supposedly pro-Western regime in North Yemen.

As the Soviets become net importers of oil in the next decade, their geopolitical position will help them intimidate oil producers into favorable arrangements that can only see Western access to petroleum supplies lessen and Western influence diminish in Arab capitals. But more than just oil is at stake.

Instability on the African continent is a real threat to all of us. The Soviets have nothing to lose in these adventures; of 27 major metals and minerals vital to keeping a modern economy in business and maintaining a strong defense posture, the Soviet Union is self-sufficient in 21, and nearly so in the remaining 6. By contrast, the United States is now mineral-poor. According to statistics published by the U.S. Bureau of Mines, the United States imported 90% of its manganese, nearly 99% of chrome ore and 83% of palladium and platinum. Nearly 95% of bauxite, or aluminum ore, was imported, as was most cobalt.

The United States now imports ores and metals to the tune of nearly $20 billion per year. The Bureau of Mines predicts that this amount will more than double by the end of this century. By law, the federal government must maintain up to a three-year stockpile of 93 strategic raw materials as a hedge against instability or embargo. But stocks of a number of minerals—including titanium, cobalt, alumina and beryllium—are not up to the minimum amounts necessary to get the country through any extended interruption of supply.

What makes the future so tenuous are the sources from which we import these vital materials. Some are secure; much of our nickel originates in Canada, we import tin from Mexico, and Brazil provides columbium. But the bulk of the imports are from Africa—more specifically, central and southern Africa—and that is where the Soviets enter the picture.

South Africa alone is the world's largest exporter of manganese ore, platinum metals and chrome ore. Together with the Soviet Union, it controls the world's market in these materials. Zimbabwe is also a major producer of chromium and manganese. Namibia has large deposits of uranium, and Zaire and Zimbabwe have tremendous reserves of cobalt. Without any or all of these nations trading on the raw-materials market, the Soviets could control both price and supply to the West.

The current troubles in southern Africa are a good example of what constitutes a real dilemma for the West. The question of majority rule is one close to the hearts of most Americans. The civil war in Zimbabwe, the effort to bring about an independent Namibia (with the United Nations as midwife) and the increasing racial friction in South Africa are viewed as poignant expressions of a wider human-rights struggle. The Soviets, who have armed and trained anti-Western, "anti-colonialist" liberation movements in each of these areas, have no such higher motives. The raw materials mined in southern Africa—chromium, uranium, the platinum metals group, gold, diamonds—are among the essential ingredients for a strong industrial base. The Russians, by trading on nationalist emotions, are in fact investing in what they see as the West's ultimate economic downfall.

And, while Moscow's hand can be seen at work in the Western Sahara (backing the Polisario guerrillas), in Angola, in Shaba Province and in Chad (rich in uranium), its real objective is the riches of southern Africa. Not only is mineral wealth important there, but fully 70% of Western Europe's raw materials and 80% of its oil pass the Cape of Good Hope each year.

According to some Western observers, the jury is still out on Zimbabwe and on whether Prime Minister Robert Mugabe can maintain a nonaligned course. Mugabe has downplayed his Marxist orientation, and has pledged to attract Western investment to his nation. His ambitious rivals in the government have indicated that they are not so favorably disposed toward the West or to the whites remaining in the country. Should these opponents eventually move into power, the raw-materials equation in southern Africa could be drastically altered.

Not content with its considerable oil and mineral wealth, Russia is seeking to deny or at least control the flow of these essentials to the free world. What has transpired over the last decade is a fine-tuning of the oft-interpreted, oft-misunderstood warning to the West by former Premier Nikita S. Khrushchev that "we will bury you."

Cuba, the Palestine Liberation Organization, East Germany, Bulgaria and others in the Soviet bloc are willing surrogates in the Kremlin's new adventures. With this kind of assistance in Africa and the Middle East, the Soviets can better sustain their losses in Afghanistan while minimizing Third World criticism of "superpower interventionism," a charge increasingly favored by the more powerful of the "nonaligned" nations. So far the approach is working.

Responding to Moscow's oil and mineral dynamic is no easy matter. A good start would be for the Reagan Administration and Congress to establish a workable strategic-minerals policy that would take into account our defense and economic needs as well as environmental considerations. Filling stockpile quotas to assure U.S. freedom from market fluctuations or supply cutoffs should be carried out forthwith.

But foreign policy is another matter. Washington must play "catch-up" in reasserting and reestablishing its influence in regions on which we depend for vital strategic materials. Pro-Soviet and anti-Western inroads in such areas as sub-Saharan Africa (principally Chad), the Persian Gulf and Southeast Asia over the past decade have placed the United States at a distinct geopolitical disadvantage. To cut U.S. losses

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and roll back Soviet influence, the Reagan Administration must implant selective, efficacious aid programs aimed at winning over mineral producers in the Third World.

Washington must impress on its Western European allies the serious implications of the mineral scramble in Africa. As dependent as Europeans are on oil, they are equally or more dependent on African mineral sources. France seems to have recognized this; it continues to carry on an aggressive foreign policy in Africa, chiefly among its former colonies but recently in East Africa as well.

Most important, however, is the need for Americans to understand the gravity of the crisis at hand. Most Americans realize the importance of oil to our economy. But mention cobalt or tungsten or vanadium and you'll most likely draw a blank.

More straight talk from the experts and officeholders about the need to check the Soviets' drive to deprive the West of strategic mineral and fuel sources is called for. It has taken nearly a decade for many Americans to understand what the energy crisis is all about. We can't afford the same kind of lethargy on the question of a strategic-minerals supply.

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BUREAU OF INTELLIGENCE AND RESEARCH

ASSESSMENTS AND RESEARCH



# (U) SOVIET TRADE IN MINERALS AND METALS: EVIDENCE OF DECLINING SELF-SUFFICIENCY

## (C) Key Judgments

Soviet trade in non-fuel minerals[1/] has been changing in recent years: some traditional mineral exports have fallen sharply, while imports of a wide range of mineral-based commodities have increased. The USSR's self-sufficiency in minerals has been declining primarily because of the gradual exhaustion of ore grades in existing mines, delays in exploiting Siberian resources, and continuing inadequacies in technology, capital, and labor.

The available evidence seems to indicate, however, that any Soviet production shortfall in the next several years is unlikely to be of sufficient magnitude to have a significant effect on world mineral markets or to induce an international scramble for access to mineral resources. Over the longer term, the outlook will depend on the Soviet Union's success in overcoming problems that have inhibited production increases and delayed new projects.

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1/ (U) Excludes oil, natural gas, coal, and uranium.

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## Introduction

(C) The Soviet Union, long regarded as basically self-sufficient in the production of non-fuel minerals, in recent years has:

--sharply reduced its exports of certain strategic minerals;[2/] and

--increased its imports of a wide range of mineral and metal commodities, for itself and indirectly for its East European allies.

(C) This changing trend in Soviet metals trade represents a significant reversal from the past several decades and suggests declining Soviet ability to meet domestic raw material and industrial requirements. Further, it raises concern that this declining self-sufficiency could lead to a tightening of world metal markets (and thus higher prices) in coming years, an expansion of Soviet involvement in the mineral-producing countries of the Third World, and in general an intensified competition between East and West for access to world mineral supplies.

(U) The Soviet Union is a leading world producer of most industrial raw materials; because of its vast size (one-sixth of the world's land area), it holds considerable reserves of virtually every major non-fuel mineral. (See map, pg. 2.) It is the world's leading producer of iron ore and crude steel, manganese ore, platinum-group metals, asbestos, cement, and potassium salts. It ranks second to the US in aluminum, lead, and phosphate rock; second to Canada in nickel; and second to South Africa in gold and chromium ore. As of 1975, it was a net importer of only bauxite-alumina (the raw materials of aluminum), cobalt, tin, tungsten, fluorspar, and barite.

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2/ (U) This imprecise term refers generally to minerals that: (a) are considered essential to modern industrial and military production; (b) have few or no substitutes; and (c) are largely produced in and supplied by a few countries which are of uncertain political stability. As used in this paper, the term includes: asbestos, cobalt, chromium, manganese, platinum-group metals, titanium, and vanadium. These minerals have special properties--e.g., resistance to high temperatures, anti-corrosiveness, and low weight/strength ratios--needed in the production of jet engines, submarines, armaments, and other strategically important products.


## U.S.S.R.
### Principal Deposits of Non-Fuel Minerals

| | | | |
|---|---|---|---|
| Al | Aluminum | Mo | Molybdenum |
| Cr | Chromium | Ni | Nickel |
| Co | Cobalt | Pt | Platinum |
| Cu | Copper | K | Potassium |
| Dm | Diamonds | Sn | Tin |
| Au | Gold | Ti | Titanium |
| Fe | Iron | W | Tungsten |
| Pb | Lead | V | Vanadium |
| Mn | Manganese | Zn | Zinc |

0 500 miles
0 500 kilometers

(U) The Soviet Government's traditional emphasis on development of heavy industry has necessitated a rapid expansion of mineral and metal output. Moscow has followed a minerals policy based on maximization of self-sufficiency at virtually any cost; accordingly, it has invested heavily in mineral exploration and production. These efforts have achieved remarkable success. Although the Soviet Union has become the world's second largest producer of industrial manufactures, it has remained self-sufficient in non-fuel minerals to a far greater extent than has the US and its Western allies (see Table 1, appended).

Declining Self-Sufficiency

(C) Since the early 1970s, however, Soviet production growth in non-fuel minerals and mineral-based commodities has slowed to its lowest rate since World War II. This trend of slowing production growth (see Table 2) is particularly noteworthy because it extends over such a wide range of commodities--from basic industrial raw materials, such as steel, cement, copper, and aluminum, to specialized strategic minerals, including platinum, titanium, vanadium, and nickel.

(C) Available estimates suggest that the Soviet Union has been forced to reduce its exports of certain materials and increase its imports of others in order to meet domestic requirements. From 1975 to 1979, Soviet exports declined significantly for vanadium (-42%), chromium (-36%), asbestos (-27%), titanium (-23%), nickel (-17%), and manganese (-11%), while Soviet import dependence rose for bauxite-alumina, molybdenum, tungsten, barite, and fluorspar (see Tables 3, 4, and 5). In addition, the country appears to be moving toward slight dependence on imports for its supplies of lead, zinc, phosphates, and sulfur.

(U) Although still the world's largest producer of crude steel, the USSR experienced declines in crude steel production in 1979 and 1980. It does not have the capacity to produce certain specialized products and has been forced to rely more than in the past on imports of high-quality pipe, rolled steel, and steel sections for various industrial projects. In 1978 it became a net importer of steel products; in 1979, its total steel imports ($4.5 billion) surpassed grain as the largest single commodity import.

(C) Additional evidence of the changing trend can be seen in the trade data of the USSR's partners in the Council for Mutual Economic Assistance (CEMA).[2/] For the first 30 years

2/ (U) Current CEMA members are: Bulgaria, Cuba, Czechoslovakia, the German Democratic Republic, Hungary, Mongolia, Poland, Romania, the USSR, and Vietnam. Albania joined in 1949, but in 1961 ceased taking part in meetings. Yugoslavia obtained permanent observer status in 1965.

after World War II, these countries were dependent on the Soviets for virtually all of their imported raw materials. Since about 1975, however, the CEMA countries (particularly East Germany, Czechoslovakia, and Poland) have been increasing imports of certain materials from non-Soviet sources as shipments from the USSR have failed to meet their growing import requirements.

(U) Reasons for the Decline

The main reason for the decline in the USSR's ability to meet many commodity requirements for itself and its East European allies appears to be the gradual exhaustion of its highest grade and most accessible mineral ores, located primarily west of the Urals. The result has been a growing dependence on supply sources in the more remote and inhospitable areas east of the Urals where the costs of extraction and transport are extremely high. Although declining mineral ore grades are a worldwide phenomenon, Soviet technology has lagged appreciably behind that of the West in developing the improved methods of exploration, mining, and processing needed to offset these costs. High costs and technical problems have resulted in continual delays in the completion of such ambitious mining and metallurgical projects as the Norilsk non-ferrous metals scheme in western Siberia and the giant Kursk iron and steel complex located some 300 miles south of Moscow.

The Soviet Union's past success in economic development, including its great expansion of mining and metal output, was achieved primarily through greater inputs of labor and capital rather than improving technology. This formula is now proving inadequate. Growth of the Soviet working-age population has slowed by half in the past two decades and is expected to slow further over the remainder of the century. Greater reliance is already being placed on older people, less-skilled workers, and the relatively fast growing USSR Asiatic population. Labor turnover in mining operations is high because of poor housing and services in the more remote mining areas and low material incentives throughout the sector. Availability of investment capital for the mining of non-fuel minerals has been severely constrained by slowing economic growth,[3/] continuing heavy emphasis on military spending, and the higher priority assigned to the energy sector.

Soviet Responses

(C) The Soviets have been able to meet some of their needs by increasing imports of certain raw materials from other communist countries. This is the case for cobalt (obtained in

3/ (U) Annual GNP growth has declined from 6% in the 1950s to 5% in the 1961-74 period and 2.6% since 1975; the average growth rate of 1.1% in 1979-80 was the lowest for any two-year period since World War II.

part from Cuban shipments of cobalt-nickel concentrates), barite (imported largely from Bulgaria, North Korea, and Romania), and fluorspar (from Mongolia). It will probably also hold true for molybdenum (now supplied mainly by the US) by the mid-1980s, when supplies are expected to be available from Mongolia.

(C) In other cases, the Soviets have been able to satisfy some of their requirements via long-term contracts with Third World countries. Over the past 25 years, the USSR and its CEMA partners have negotiated agreements with some 50 developing countries, in many instances arranging for deliveries of raw materials in exchange for the economic and technical assistance needed to exploit these materials in the home countries. The most important of these supply agreements have been with Guinea for bauxite, Bolivia for tin, and Morocco for phosphates. Similar agreements with some 20 African countries, plus India, Iran, Afghanistan, Guyana, and Turkey, have focused on such materials as iron, steel, and aluminum.

(U) The USSR also has been turning to Western industrialized countries to obtain technology and capital to expand mineral and metal production. The Soviets have umbrella agreements with several governments under which they work out contracts with individual firms for specific deals. Trade under such contracts has been based increasingly on "compensation" or "buy-back" provisions. These provisions arrange for Soviet purchases of equipment and technology to be financed by Western credits which will be repaid by export earnings of goods produced with the equipment and technology. Perhaps the best known of the non-fuel minerals and metals projects (many projects have involved petroleum or natural gas) have been with a Finnish firm for the copper-nickel complex at Norilsk, with four West German firms for an electrosmelting plant at the iron and steel complex near Kursk, and with a French firm for an alumina plant at Nikolayev and an aluminum plant at Sayansk.

(C) Implications

The available evidence seems to indicate that any likely shortfall in Soviet production of raw materials in the next several years will not be of sufficient magnitude to induce an international scramble for access to mineral resources (i.e., a "resource war"). A July 1980 report of the NATO Economic Committee concluded that in the short-to-medium term--up to 1985--the Soviet Union's dependence on mineral imports will likely increase, or remain steady, for bauxite-alumina, lead, zinc, tin, fluorspar, sulfur, and phosphates and diminish for cobalt, molybdenum, and tungsten. The report also concluded that the USSR has already negotiated long-term contracts with producing countries for all of these minerals except tungsten, and that these agreements have had only a marginal effect on world mineral markets.

The outlook for Soviet mineral production over the longer term--beyond 1985--is more uncertain and will depend primarily on the USSR's ability to overcome (in some cases with Western cooperation) some of the labor and technology problems now delaying planned mining projects. The Soviet leadership appears to recognize the importance of these problems and has assigned a high priority to the Norilsk mining and metallurgical scheme in the 11th Five-Year Plan (1981-85). If the expansion of the Norilsk complex is completed by 1985, as now planned, the USSR's production of copper, nickel, platinum-group metals, and cobalt will be greatly increased, perhaps even providing an exportable surplus of cobalt.

The changes in recent Soviet minerals trade are, moreover, not solely a reflection of declining self-sufficiency in Soviet production. The reduced mineral exports are also in part a result of decreased foreign exchange needs as the higher prices of major Soviet exports (oil, natural gas, gold, platinum) have diminished the Soviets' need to export certain minerals that they prefer to reserve for domestic consumption. In addition, recent technological advances (especially in the processing of chrome) and the development of alternative suppliers (especially for manganese) have weakened demand for Soviet metal exports.

This relatively sanguine conclusion about the prospects for Soviet mineral production does not preclude the possibility that the Soviets will nevertheless act whenever possible to complicate Western access to world mineral resources. The potential for such actions is particularly significant in certain countries (South Africa, Zaire, Zambia, and Zimbabwe) of central and southern Africa which, together with the USSR, account for a high percentage of the world's production and reserves of several strategic minerals (see Table 6).

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(U) Table 1. IMPORTS OF SELECTED NON-FUEL MINERALS AS A SHARE OF CONSUMPTION, 1979
(in percentages)

| Commodity | US | Japan | European Economic Community | USSR and Eastern Europe |
|---|---|---|---|---|
| Bauxite | 93 | 100 | 85 | 35 |
| Chromium | 90 | 96 | 95 | 0 |
| Cobalt | 100 | 100 | 100 | 15 |
| Copper | 13 | 92 | 95 | 0 |
| Iron Ore | 28 | 99 | 82 | 15 |
| Lead | 8 | 78 | 60 | 5 |
| Manganese | 98 | 95 | 99 | 0 |
| Nickel | 78 | 90 | 80 | 0 |
| Tin | 81 | 85 | 88 | 45 |
| Zinc | 62 | 60 | 60 | 0 |

Source: Central Intelligence Agency estimates.

(C) Table 2. USSR PRODUCTION[1/] OF SELECTED NON-FUEL MINERAL COMMODITIES: 1960, 1965, 1970, 1975-80
(in thousand metric tons unless otherwise specified)

| Commodity | 1960 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980[2/] |
|---|---|---|---|---|---|---|---|---|---|
| A. Metals | | | | | | | | | |
| Aluminum: | | | | | | | | | |
| Bauxite | 3,500 | 4,700 | 4,300 | 4,400 | 4,500 | 4,600 | 4,600 | 4,600 | 4,600 |
| Nepheline concentrate | 200 | 900 | 400 | 2,300 | 2,400 | 2,500 | 2,500 | 2,500 | 2,500 |
| Alunite ore | N.A. | 50 | 200 | 600 | 600 | 600 | 600 | 600 | 600 |
| Alumina | N.A. | N.A. | 1,800 | 2,400 | 2,500 | 2,600 | 2,600 | 2,600 | 2,700 |
| Primary metal | 675 | 840 | 1,100 | 1,530 | 1,600 | 1,640 | 1,670 | 1,750 | 1,790 |
| Chromium: Chromite ore | 915 | 1,270 | 1,750 | 2,080 | 2,120 | 2,180 | 2,300 | 2,400 | 2,450[3/] |
| Cobalt: | | | | | | | | | |
| Mine output (metric tons) | 800 | 1,300 | 1,550 | 1,800 | 1,800 | 1,900 | 1,950 | 2,000 | 2,050 |
| Smelter (metric tons) | N.A. | N.A. | N.A. | N.A. | 3,800 | 3,900 | 3,950 | 4,000 | 4,100[4/] |
| Copper: Ore | N.A. | 70,000 | 57,000 | 119,000 | 124,000 | 124,450 | 125,000 | 125,000 | 126,000 |
| Blister: Primary | N.A. | N.A. | 570 | 800 | 840 | 850 | 865 | 885 | 905 |
| Secondary | N.A. | N.A. | 140 | 74 | 80 | 85 | 90 | 95 | 95 |
| Gold (million troy oz.) | N.A. | 5.0 | 6.5 | 7.5 | 7.7 | 7.85 | 8.0 | 8.16 | 8.3 |
| Iron and Steel: | | | | | | | | | |
| Iron ore | 105,900 | 153,400 | 195,500 | 232,800 | 241,108 | 241,851 | 246,251 | 241,738 | 245,000 |
| Pig iron and ferroalloys | 46,800 | 66,200 | 85,900 | 102,968 | 105,384 | 107,368 | 110,702 | 110,000 | 109,500 |
| Crude steel | 65,300 | 91,000 | 115,900 | 141,344 | 144,825 | 146,678 | 151,436 | 148,099 | 148,000 |
| Semi-manufactures | 50,957 | 61,600 | 82,142 | 98,690 | 103,113 | 103,935 | 107,277 | 103,245 | 103,000 |
| Lead: Ore | N.A. | N.A. | 440 | N.A. | 500 | 510 | 520 | 525 | 530 |
| Smelter: Primary | 325 | 350 | 440 | 480 | 500 | 510 | 520 | 525 | 530 |
| Secondary | N.A. | 70 | 90 | 95 | 100 | 100 | 100 | 100 | 100 |
| Manganese ore | 5,872 | 7,576 | 6,841 | 8,459 | 8,636 | 8,595 | 9,057 | 10,244 | 10,250 |

Table 2 (cont'd)

| Commodity | 1960 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|---|
| Molybdenum (metric tons) | 5,000 | 6,200 | 7,700 | 9,060 | 9,350 | 9,700 | 9,900 | 10,200 | 10,400 |
| Nickel: Ore | 58 | 85 | 110 | 135 | 141 | 144 | 148 | 152 | 154 |
| Platinum (thousand troy oz.) | 330 | 1,700 | 2,200 | 3,300 | 3,450 | 3,100 | 3,150 | 3,200 | 3,250 |
| Silver metal (thousand troy oz.) | 25,000 | 31,000 | 38,000 | 43,000 | 44,000 | 45,000 | 46,000 | 46,000 | 47,000 |
| Tin: Primary (metric tons) | 16,260 | 23,375 | 27,440 | 30,489 | 31,000 | 33,000 | 34,000 | 35,000 | 36,000 |
| Secondary (metric tons) | N.A. | 7,114 | 10,163 | 10,163 | 11,000 | 12,000 | 12,000 | 12,000 | 12,000 |
| Titanium: | | | | | | | | | |
| Concentrates (metric tons) | | | | | | | | | |
| Ilmenite | N.A. | N.A. | N.A. | N.A. | 380,000 | 400,000 | 410,000 | 410,000 | 420,000 |
| Rutile | N.A. | N.A. | N.A. | N.A. | 27,000 | 27,000 | 30,000 | 30,000 | 30,000 |
| Metal (metric tons) | 1,000 | 7,000 | 12,500 | 30,000 | 32,000 | 34,000 | 35,000 | 36,000 | 37,000 |
| Tungsten concentrates (metric tons) | 9,500 | 12,000 | 6,700 | 7,800 | 8,000 | 8,200 | 8,500 | 8,700 | 8,700 |
| Vanadium (metric tons) | N.A. | N.A. | 3,064 | 8,000 | 8,000 | 9,000 | 9,500 | 10,000 | 10,000 |
| Zinc: Primary | 395 | 480 | 610 | 690 | 720 | 735 | 770 | 770 | 785 |
| Secondary | N.A. | 55 | 70 | 75 | 80 | 80 | 80 | 80 | 80 |
| B. Non-Metals | | | | | | | | | |
| Asbestos | 600 | 745 | 1,065 | 1,900 | 1,850 | 1,900 | 1,945 | 2,020 | 2,150 |
| Barite | 130 | 230 | 285 | 350 | 400 | 450 | 475 | 500 | 500 |
| Cement, hydraulic | 45,500 | 72,400 | 95,200 | 122,057 | 124,246 | 127,056 | 126,956 | 123,019 | 125,000 |
| Diamonds: | | | | | | | | | |
| Gem (thousand carats) | 200 | 800 | 1,600 | 1,950 | 2,000 | 2,100 | 2,150 | 2,200 | 2,250 |
| Industrial (thousand carats) | 750 | 3,200 | 6,250 | 7,750 | 7,800 | 8,200 | 8,400 | 8,500 | 8,600 |

Table 2 (cont'd) USSR PRODUCTION OF SELECTED NON-FUEL MINERAL COMMODITIES

| Commodity | 1960 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|---|
| Feldspar | 200 | 230 | 250 | 280 | 280 | 290 | 300 | 310 | 310 |
| Fluorspar | 190 | 350 | 410 | 475 | 490 | 500 | 510 | 520 | 520 |
| Mica | N.A. | 33 | 38 | 42 | 43 | 44 | 45 | 46 | 46 |
| Nitrogen (N content of ammonia) | N.A. | 2,500 | 5,423 | 8,535 | 10,090 | 10,744 | 11,300 | 12,200 | N.A. |
| Phosphate rock: Ore | N.A. | 30,900 | 46,200 | 50,600 | 54,000 | 58,500 | 60,300 | 63,200 | 64,000 |
| Concentrates | N.A. | N.A. | 20,800 | 22,800 | 23,900 | 24,250 | 24,362 | 25,580 | 26,000 |
| Sulfur | 2,400 | 1,430 | 1,120 | 4,780 | 9,140 | 9,740 | 10,550 | 10,550 | 10,900 |

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1/ The USSR does not publish official statistics for its production or trade of most minerals; unless otherwise indicated, the data presented here are estimates provided by the Bureau of Mines, US Department of Interior. Estimates from the Central Intelligence Agency are generally in agreement with these data, except where specified below.

2/ Estimates for 1980 are preliminary.

3/ CIA estimates for USSR production of chromite are generally 30-75% higher than the Bureau of Mines estimates shown in the above table. The gap is based primarily on estimates of gross ore (CIA) versus recoverable metal content (Bureau of Mines).

4/ CIA estimates for USSR production of cobalt and nickel are about 50% higher than the Bureau of Mines estimates shown above.

(C) Table 3. USSR EXPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES: 1961, 1965, 1970, 1975-79
(metric tons unless otherwise specified)

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| A. Metals | | | | | | | | |
| Aluminum: | | | | | | | | |
| Unwrought metal | 86,000 | 229,000 | 368,900 | 502,360 | 520,000 | 540,000 | 560,000 | 560,000 |
| Semi-manufactures, rolled only | 13,500 | 42,100 | 131,000 | 101,500 | 110,000 | 100,000 | 110,000 | 110,000 |
| Chromium: Chromite ore and concentrate (thousand metric tons) | 438 | 748 | 1,200 | 1,170 | 975 | 673 | 900 | 750 |
| Cobalt: Primary forms | 300 | 200 | 0 | 0 | 0 | 0 | 0 | 0 |
| Copper: Unwrought, unalloyed | 60,400 | 93,100 | 123,100 | 205,620 | 220,000 | 220,000 | 240,000 | 240,000 |
| Alloyed | 2,300 | 3,300 | 8,700 | 4,240 | 7,000 | 7,000 | 7,000 | 7,000 |
| Semi-manufactures, rolled only | 13,600 | 10,700 | 18,700 | 17,615 | 18,000 | 18,000 | 18,000 | 18,000 |
| Iron and Steel: | | | | | | | | |
| Iron ore (thousand metric tons) | 16,283 | 24,138 | 36,100 | 43,620 | 43,120 | 40,946 | 42,000 | 41,000 |
| Pig iron (thousand metric tons) | 1,814 | 3,659 | 4,800 | 4,730 | 4,527 | 4,500 | 4,500 | 4,600 |
| Ferroalloys (thousand metric tons) | 155 | 205 | 326 | 418 | 418 | 420 | 420 | 420 |
| Steel semi-manufactures (thousand metric tons) | 2,816 | 4,813 | 6,260 | 6,430 | 6,722 | 6,500 | 6,500 | 6,600 |
| Lead: Unwrought | 102,300 | 102,500 | 92,400 | 98,900 | 99,000 | 95,000 | 95,000 | 95,000 |
| Manganese: Ore (thousand metric tons) | 896 | 1,020 | 1,200 | 1,410 | 1,342 | 1,352 | 1,186 | 1,250 |
| Nickel[1/] (thousand metric tons) | N.A. | N.A. | 19 | 13 | 11 | 11 | 22 | 26 |

Table 3 (cont'd) USSR EXPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| Platinum-group metals[1/] (thousand troy oz.) | N.A. | 1,000 | 1,535 | 1,361 | 2,036 | 1,954 | 1,878 | 2,145 |
| Titanium[1/] | N.A. | N.A. | 4.3 | 5.2 | 2.5 | 2.9 | 3.0 | 4.0 |
| Vanadium slag | N.A. | N.A. | 38,300 | 20,600 | 12,913 | 12,000 | 12,000 | 12,000 |
| Zinc: Unwrought | 116,200 | 132,700 | 95,100 | 100,600 | 100,000 | 100,000 | 100,000 | 100,000 |
| B. Non-Metals | | | | | | | | |
| Asbestos | 158,600 | 248,400 | 385,300 | 613,000 | 630,000 | 600,000 | 600,000 | 450,000 |
| Cement (thousand metric tons) | 408 | 2,016 | 3,200 | 3,300 | 2,882 | 3,438 | 3,548 | 3,500 |
| Fertilizer Material: | | | | | | | | |
| Apatite concentrates (thousand metric tons) | N.A. | N.A. | 5,600 | 5,800 | 5,900 | 5,900 | 6,000 | 6,000 |
| Nitrogenous: urea (thousand metric tons) | N.A. | N.A. | 222 | 499 | 677 | 925 | 1,035 | 1,200 |
| Phosphatic (thousand metric tons) | N.A. | N.A. | 651 | 530 | 533 | 628 | 703 | 750 |
| Potassic (thousand metric tons) | N.A. | N.A. | 3,100 | 5,985 | 5,567 | 6,024 | 5,771 | 6,000 |

Source: US Bureau of Mines, unless otherwise specified.

1/ Estimates for this commodity are from the Central Intelligence Agency; estimates not available from the Bureau of Mines.

(C) Table 4. USSR IMPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES: 1961, 1965, 1970, 1975-79
(metric tons unless otherwise specified)

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| A. Metals | | | | | | | | |
| Aluminum: | | | | | | | | |
| Bauxite (thousand metric tons) | 455 | 605 | 1,548 | 3,477 | 3,524 | 3,500 | 3,500 | 3,500 |
| Alumina (thousand metric tons) | N.A. | N.A. | 518 | 1,028 | 1,000 | 1,000 | 1,000 | 1,000 |
| Metal and alloys (thousand metric tons) | N.A. | N.A. | 1,600 | 3,540 | 3,000 | 3,000 | 3,000 | 3,500 |
| Cobalt 1/ | | | | | | | | |
| Concentrates (metal content) | N.A. | N.A. | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Metal | N.A. | N.A. | 500 | 500 | 500 | 500 | 500 | 500 |
| Copper: Unwrought metal | N.A. | 700 | 1,021 | 8,500 | 8,000 | 8,000 | 8,000 | 8,000 |
| Semi-manufactures | N.A. | 5,800 | 10,560 | 25,400 | 20,000 | 25,000 | 25,000 | 25,000 |
| Iron and Steel: | | | | | | | | |
| Pig iron (thousand metric tons) | 134 | 148 | 69 | 135 | 229 | 200 | 200 | 200 |
| Ferroalloys (thousand metric tons) | 16 | 6 | 6 | 40 | 33 | 35 | 35 | 35 |
| Lead: Ore | 33,900 | 30,600 | 50,700 | 54,674 | 41,544 | 49,818 | 47,695 | 6,000 |
| Unwrought metal | 39,500 | 47,900 | 38,800 | 56,700 | 60,000 | 55,000 | 60,000 | 80,000 |
| Tin: Ore and concentrates | N.A. | N.A. | N.A. | 470 | 2,000 | 2,000 | 2,000 | 2,000 |
| Metal, unwrought | N.A. | 5,800 | 8,169 | 9,700 | 8,000 | 6,000 | 7,000 | 7,000 |
| Tungsten, concentrate | 18,900 | 6,000 | N.A. | 1,700 | 2,000 | 2,000 | 3,000 | 3,000 |
| Zinc: Ore and concentrate | N.A. | 28,000 | 9,230 | 48,983 | 41,102 | 81,655 | 78,241 | 18,700 |
| Metal, unwrought | N.A. | 64,700 | 57,300 | 49,100 | 49,000 | 49,000 | 64,000 | 49,000 |

Table 4 (cont'd) USSR IMPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| B. Non-Metals | | | | | | | | |
| Barite | 71,100 | 105,200 | 151,700 | 330,000 | 350,000 | 400,000 | 450,000 | 450,000 |
| Cement: Hydraulic (thousand metric tons) | 1,740 | 67 | 481 | 811 | 552 | 636 | 592 | 600 |
| Fluorspar | 76,000 | 116,000 | 144,700 | 494,000 | 500,000 | 550,000 | 550,000 | 550,000 |
| Sulfur | 44,500 | 25,200 | 216,700 | 690,000 | 600,000 | 600,000 | 600,000 | 600,000 |
| Fertilizer materials: Phosphatic (thousand metric tons) | N.A. | N.A. | N.A. | 137 | 50 | 44 | 84 | 100 |

Source: US Bureau of Mines.

1/ (C) The Central Intelligence Agency estimates that annual imports of cobalt concentrates from Cuba and cobalt metal from Zaire and Zambia fluctuated only slightly throughout the 1970s. Estimates are not available from the Bureau of Mines.

(C) Table 5. USSR NET IMPORT RELIANCE FOR SELECTED NON-FUEL MINERALS AS A PERCENT OF CONSUMPTION IN 1975 AND 1979
(minus percents indicate net exports)

| Commodity | 1975 | 1979 | Principal Suppliers in 1979 |
|---|---|---|---|
| A. Metals | | | |
| Bauxite - Alumina | 33 | 39 | Guinea, Yugoslavia, Hungary, Greece |
| Cobalt 1/ | 36 | 24 | Cuba, Zaire, Zambia |
| Copper | -27 | -30 | |
| Gold | -140 | -100 | |
| Iron Ore | -23 | -20 | |
| Manganese | -20 | -15 | |
| Chromium | -128 | -44 | |
| Molybdenum 2/ | 18 | 25 | United States |
| Nickel 1/ | -7 | -12 | |
| Platinum - Group Metals | -40 | -45 | |
| Silver | -10 | -10 | |
| Tin | 25 | 21 | Malaysia, UK, Bolivia |
| Tungsten | 18 | 26 | China, Mongolia |
| B. Non-Metals | | | |
| Asbestos | -46 | -32 | |
| Fluorspar | 50 | 52 | Mongolia, China |
| Barite | 48 | 51 | Yugoslavia, North Korea, Bulgaria |

Source: US Bureau of Mines data.

1/ Percents based on Central Intelligence Agency estimates.

2/ Percents based on NATO Economic Committee estimates.

(U) Table 6. COMBINED CENTRAL/SOUTHERN AFRICAN AND USSR PERCENTAGES OF WORLD'S PRODUCTION AND RESERVES OF SELECTED NON-FUEL MINERALS, 1979

| Commodity | Central/Southern Africa | | USSR | | Combined Percentages | |
|---|---|---|---|---|---|---|
| | % of Production | % of Reserves | % of Production | % of Reserves | Production | Reserves |
| Chromium Ore | 39 | 95 | 25 1/ | 3 1/ | 64 | 98 |
| Cobalt | 54 | 60 | 11 1/ | 14 1/ | 65 | 74 |
| Diamonds (industrial) | 60 | 88 | 28 | 4 | 88 | 92 |
| Gold | 57 | 42 | 22 | 30 | 79 | 72 |
| Manganese Ore | 21 | 37 | 46 1/ | 50 1/ | 67 | 87 |
| Platinum - Group Metals | 48 | 74 | 48 | 25 | 96 | 99 |
| Vanadium | 42 | 49 | 28 | 46 | 70 | 95 |

Source: US Bureau of Mines.

1/ Includes estimates for all communist countries.

SOV. — STRATEGIC MINERALS

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# (U) SOVIET TRADE IN MINERALS AND METALS: EVIDENCE OF DECLINING SELF-SUFFICIENCY

## (C) Key Judgments

Soviet trade in non-fuel minerals[1/] has been changing in recent years: some traditional mineral exports have fallen sharply, while imports of a wide range of mineral-based commodities have increased. The USSR's self-sufficiency in minerals has been declining primarily because of the gradual exhaustion of ore grades in existing mines, delays in exploiting Siberian resources, and continuing inadequacies in technology, capital, and labor.

The available evidence seems to indicate, however, that any Soviet production shortfall in the next several years is unlikely to be of sufficient magnitude to have a significant effect on world mineral markets or to induce an international scramble for access to mineral resources. Over the longer term, the outlook will depend on the Soviet Union's success in overcoming problems that have inhibited production increases and delayed new projects.

* * * * * * *

1/ (U) Excludes oil, natural gas, coal, and uranium.

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GDS 4/16/87 (Ericksen, E.)

Report 116-AR
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## Introduction

(C) The Soviet Union, long regarded as basically self-sufficient in the production of non-fuel minerals, in recent years has:

--sharply reduced its exports of certain strategic minerals;2/ and

--increased its imports of a wide range of mineral and metal commodities, for itself and indirectly for its East European allies.

(C) This changing trend in Soviet metals trade represents a significant reversal from the past several decades and suggests declining Soviet ability to meet domestic raw material and industrial requirements. Further, it raises concern that this declining self-sufficiency could lead to a tightening of world metal markets (and thus higher prices) in coming years, an expansion of Soviet involvement in the mineral-producing countries of the Third World, and in general an intensified competition between East and West for access to world mineral supplies.

(U) The Soviet Union is a leading world producer of most industrial raw materials; because of its vast size (one-sixth of the world's land area), it holds considerable reserves of virtually every major non-fuel mineral. (See map, pg. 2.) It is the world's leading producer of iron ore and crude steel, manganese ore, platinum-group metals, asbestos, cement, and potassium salts. It ranks second to the US in aluminum, lead, and phosphate rock; second to Canada in nickel; and second to South Africa in gold and chromium ore. As of 1975, it was a net importer of only bauxite-alumina (the raw materials of aluminum), cobalt, tin, tungsten, fluorspar, and barite.

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2/ (U) This imprecise term refers generally to minerals that: (a) are considered essential to modern industrial and military production; (b) have few or no substitutes; and (c) are largely produced in and supplied by a few countries which are of uncertain political stability. As used in this paper, the term includes: asbestos, cobalt, chromium, manganese, platinum-group metals, titanium, and vanadium. These minerals have special properties--e.g., resistance to high temperatures, anti-corrosiveness, and low weight/strength ratios--needed in the production of jet engines, submarines, armaments, and other strategically important products.


## U.S.S.R.
### Principal Deposits of Non-Fuel Minerals

| | | | |
|---|---|---|---|
| Al | Aluminum | Mo | Molybdenum |
| Cr | Chromium | Ni | Nickel |
| Co | Cobalt | Pt | Platinum |
| Cu | Copper | K | Potassium |
| Dm | Diamonds | Sn | Tin |
| Au | Gold | Ti | Titanium |
| Fe | Iron | W | Tungsten |
| Pb | Lead | V | Vanadium |
| Mn | Manganese | Zn | Zinc |

0 500 miles
0 500 kilometers





12A

(U) The Soviet Government's traditional emphasis on development of heavy industry has necessitated a rapid expansion of mineral and metal output. Moscow has followed a minerals policy based on maximization of self-sufficiency at virtually any cost; accordingly, it has invested heavily in mineral exploration and production. These efforts have achieved remarkable success. Although the Soviet Union has become the world's second largest producer of industrial manufactures, it has remained self-sufficient in non-fuel minerals to a far greater extent than has the US and its Western allies (see Table 1, appended).

Declining Self-Sufficiency

(C) Since the early 1970s, however, Soviet production growth in non-fuel minerals and mineral-based commodities has slowed to its lowest rate since World War II. This trend of slowing production growth (see Table 2) is particularly noteworthy because it extends over such a wide range of commodities--from basic industrial raw materials, such as steel, cement, copper, and aluminum, to specialized strategic minerals, including platinum, titanium, vanadium, and nickel.

(C) Available estimates suggest that the Soviet Union has been forced to reduce its exports of certain materials and increase its imports of others in order to meet domestic requirements. From 1975 to 1979, Soviet exports declined significantly for vanadium (-42%), chromium (-36%), asbestos (-27%), titanium (-23%), nickel (-17%), and manganese (-11%), while Soviet import dependence rose for bauxite-alumina, molybdenum, tungsten, barite, and fluorspar (see Tables 3, 4, and 5). In addition, the country appears to be moving toward slight dependence on imports for its supplies of lead, zinc, phosphates, and sulfur.

(U) Although still the world's largest producer of crude steel, the USSR experienced declines in crude steel production in 1979 and 1980. It does not have the capacity to produce certain specialized products and has been forced to rely more than in the past on imports of high-quality pipe, rolled steel, and steel sections for various industrial projects. In 1978 it became a net importer of steel products; in 1979, its total steel imports ($4.5 billion) surpassed grain as the largest single commodity import.

(C) Additional evidence of the changing trend can be seen in the trade data of the USSR's partners in the Council for Mutual Economic Assistance (CEMA).[2/] For the first 30 years

2/ (U) Current CEMA members are: Bulgaria, Cuba, Czechoslovakia, the German Democratic Republic, Hungary, Mongolia, Poland, Romania, the USSR, and Vietnam. Albania joined in 1949, but in 1961 ceased taking part in meetings. Yugoslavia obtained permanent observer status in 1965.

after World War II, these countries were dependent on the Soviets for virtually all of their imported raw materials. Since about 1975, however, the CEMA countries (particularly East Germany, Czechoslovakia, and Poland) have been increasing imports of certain materials from non-Soviet sources as shipments from the USSR have failed to meet their growing import requirements.

(U) Reasons for the Decline

The main reason for the decline in the USSR's ability to meet many commodity requirements for itself and its East European allies appears to be the gradual exhaustion of its highest grade and most accessible mineral ores, located primarily west of the Urals. The result has been a growing dependence on supply sources in the more remote and inhospitable areas east of the Urals where the costs of extraction and transport are extremely high. Although declining mineral ore grades are a worldwide phenomenon, Soviet technology has lagged appreciably behind that of the West in developing the improved methods of exploration, mining, and processing needed to offset these costs. High costs and technical problems have resulted in continual delays in the completion of such ambitious mining and metallurgical projects as the Norilsk non-ferrous metals scheme in western Siberia and the giant Kursk iron and steel complex located some 300 miles south of Moscow.

The Soviet Union's past success in economic development, including its great expansion of mining and metal output, was achieved primarily through greater inputs of labor and capital rather than improving technology. This formula is now proving inadequate. Growth of the Soviet working-age population has slowed by half in the past two decades and is expected to slow further over the remainder of the century. Greater reliance is already being placed on older people, less-skilled workers, and the relatively fast growing USSR Asiatic population. Labor turnover in mining operations is high because of poor housing and services in the more remote mining areas and low material incentives throughout the sector. Availability of investment capital for the mining of non-fuel minerals has been severely constrained by slowing economic growth,[3/] continuing heavy emphasis on military spending, and the higher priority assigned to the energy sector.

Soviet Responses

(C) The Soviets have been able to meet some of their needs by increasing imports of certain raw materials from other communist countries. This is the case for cobalt (obtained in

3/ (U) Annual GNP growth has declined from 6% in the 1950s to 5% in the 1961-74 period and 2.6% since 1975; the average growth rate of 1.1% in 1979-80 was the lowest for any two-year period since World War II.

part from Cuban shipments of cobalt-nickel concentrates), barite (imported largely from Bulgaria, North Korea, and Romania), and fluorspar (from Mongolia). It will probably also hold true for molybdenum (now supplied mainly by the US) by the mid-1980s, when supplies are expected to be available from Mongolia.

(C) In other cases, the Soviets have been able to satisfy some of their requirements via long-term contracts with Third World countries. Over the past 25 years, the USSR and its CEMA partners have negotiated agreements with some 50 developing countries, in many instances arranging for deliveries of raw materials in exchange for the economic and technical assistance needed to exploit these materials in the home countries. The most important of these supply agreements have been with Guinea for bauxite, Bolivia for tin, and Morocco for phosphates. Similar agreements with some 20 African countries, plus India, Iran, Afghanistan, Guyana, and Turkey, have focused on such materials as iron, steel, and aluminum.

(U) The USSR also has been turning to Western industrialized countries to obtain technology and capital to expand mineral and metal production. The Soviets have umbrella agreements with several governments under which they work out contracts with individual firms for specific deals. Trade under such contracts has been based increasingly on "compensation" or "buy-back" provisions. These provisions arrange for Soviet purchases of equipment and technology to be financed by Western credits which will be repaid by export earnings of goods produced with the equipment and technology. Perhaps the best known of the non-fuel minerals and metals projects (many projects have involved petroleum or natural gas) have been with a Finnish firm for the copper-nickel complex at Norilsk, with four West German firms for an electrosmelting plant at the iron and steel complex near Kursk, and with a French firm for an alumina plant at Nikolayev and an aluminum plant at Sayansk.

(C) Implications

The available evidence seems to indicate that any likely shortfall in Soviet production of raw materials in the next several years will not be of sufficient magnitude to induce an international scramble for access to mineral resources (i.e., a "resource war"). A July 1980 report of the NATO Economic Committee concluded that in the short-to-medium term--up to 1985--the Soviet Union's dependence on mineral imports will likely increase, or remain steady, for bauxite-alumina, lead, zinc, tin, fluorspar, sulfur, and phosphates and diminish for cobalt, molybdenum, and tungsten. The report also concluded that the USSR has already negotiated long-term contracts with producing countries for all of these minerals except tungsten, and that these agreements have had only a marginal effect on world mineral markets.

The outlook for Soviet mineral production over the longer term--beyond 1985--is more uncertain and will depend primarily on the USSR's ability to overcome (in some cases with Western cooperation) some of the labor and technology problems now delaying planned mining projects. The Soviet leadership appears to recognize the importance of these problems and has assigned a high priority to the Norilsk mining and metallurgical scheme in the 11th Five-Year Plan (1981-85). If the expansion of the Norilsk complex is completed by 1985, as now planned, the USSR's production of copper, nickel, platinum-group metals, and cobalt will be greatly increased, perhaps even providing an exportable surplus of cobalt.

The changes in recent Soviet minerals trade are, moreover, not solely a reflection of declining self-sufficiency in Soviet production. The reduced mineral exports are also in part a result of decreased foreign exchange needs as the higher prices of major Soviet exports (oil, natural gas, gold, platinum) have diminished the Soviets' need to export certain minerals that they prefer to reserve for domestic consumption. In addition, recent technological advances (especially in the processing of chrome) and the development of alternative suppliers (especially for manganese) have weakened demand for Soviet metal exports.

This relatively sanguine conclusion about the prospects for Soviet mineral production does not preclude the possibility that the Soviets will nevertheless act whenever possible to complicate Western access to world mineral resources. The potential for such actions is particularly significant in certain countries (South Africa, Zaire, Zambia, and Zimbabwe) of central and southern Africa which, together with the USSR, account for a high percentage of the world's production and reserves of several strategic minerals (see Table 6).

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(U) Table 1. IMPORTS OF SELECTED NON-FUEL MINERALS AS A SHARE OF CONSUMPTION, 1979
(in percentages)

| Commodity | US | Japan | European Economic Community | USSR and Eastern Europe |
|---|---|---|---|---|
| Bauxite | 93 | 100 | 85 | 35 |
| Chromium | 90 | 96 | 95 | 0 |
| Cobalt | 100 | 100 | 100 | 15 |
| Copper | 13 | 92 | 95 | 0 |
| Iron Ore | 28 | 99 | 82 | 15 |
| Lead | 8 | 78 | 60 | 5 |
| Manganese | 98 | 95 | 99 | 0 |
| Nickel | 78 | 90 | 80 | 0 |
| Tin | 81 | 85 | 88 | 45 |
| Zinc | 62 | 60 | 60 | 0 |

Source: Central Intelligence Agency estimates.

(C) Table 2. USSR PRODUCTION[1/] OF SELECTED NON-FUEL MINERAL COMMODITIES: 1960, 1965, 1970, 1975-80
(in thousand metric tons unless otherwise specified)

| Commodity | 1960 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980[2/] |
|---|---|---|---|---|---|---|---|---|---|
| A. Metals | | | | | | | | | |
| Aluminum: | | | | | | | | | |
| Bauxite | 3,500 | 4,700 | 4,300 | 4,400 | 4,500 | 4,600 | 4,600 | 4,600 | 4,600 |
| Nepheline concentrate | 200 | 900 | 400 | 2,300 | 2,400 | 2,500 | 2,500 | 2,500 | 2,500 |
| Alunite ore | N.A. | 50 | 200 | 600 | 600 | 600 | 600 | 600 | 600 |
| Alumina | N.A. | N.A. | 1,800 | 2,400 | 2,500 | 2,600 | 2,600 | 2,600 | 2,700 |
| Primary metal | 675 | 840 | 1,100 | 1,530 | 1,600 | 1,640 | 1,670 | 1,750 | 1,790 |
| Chromium: Chromite ore | 915 | 1,270 | 1,750 | 2,080 | 2,120 | 2,180 | 2,300 | 2,400 | 2,450[3/] |
| Cobalt: | | | | | | | | | |
| Mine output (metric tons) | 800 | 1,300 | 1,550 | 1,800 | 1,800 | 1,900 | 1,950 | 2,000 | 2,050 |
| Smelter (metric tons) | N.A. | N.A. | N.A. | N.A. | 3,800 | 3,900 | 3,950 | 4,000 | 4,100[4/] |
| Copper: Ore | N.A. | 70,000 | 57,000 | 119,000 | 124,000 | 124,450 | 125,000 | 125,000 | 126,000 |
| Blister: Primary | N.A. | N.A. | 570 | 800 | 840 | 850 | 865 | 885 | 905 |
| Secondary | N.A. | N.A. | 140 | 74 | 80 | 85 | 90 | 95 | 95 |
| Gold (million troy oz.) | N.A. | 5.0 | 6.5 | 7.5 | 7.7 | 7.85 | 8.0 | 8.16 | 8.3 |
| Iron and Steel: | | | | | | | | | |
| Iron ore | 105,900 | 153,400 | 195,500 | 232,800 | 241,108 | 241,851 | 246,251 | 241,738 | 245,000 |
| Pig iron and ferroalloys | 46,800 | 66,200 | 85,900 | 102,968 | 105,384 | 107,368 | 110,702 | 110,000 | 109,500 |
| Crude steel | 65,300 | 91,000 | 115,900 | 141,344 | 144,825 | 146,678 | 151,436 | 148,099 | 148,000 |
| Semi-manufactures | 50,957 | 61,600 | 82,142 | 98,690 | 103,113 | 103,935 | 107,277 | 103,245 | 103,000 |
| Lead: Ore | N.A. | N.A. | 440 | N.A. | 500 | 510 | 520 | 525 | 530 |
| Smelter: Primary | 325 | 350 | 440 | 480 | 500 | 510 | 520 | 525 | 530 |
| Secondary | N.A. | 70 | 90 | 95 | 100 | 100 | 100 | 100 | 100 |
| Manganese ore | 5,872 | 7,576 | 6,841 | 8,459 | 8,636 | 8,595 | 9,057 | 10,244 | 10,250 |

Table 2 (cont'd)

| Commodity | 1960 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|---|
| Molybdenum (metric tons) | 5,000 | 6,200 | 7,700 | 9,060 | 9,350 | 9,700 | 9,900 | 10,200 | 10,400 |
| Nickel: Ore | 58 | 85 | 110 | 135 | 141 | 144 | 148 | 152 | 154 |
| Platinum (thousand troy oz.) | 330 | 1,700 | 2,200 | 3,300 | 3,450 | 3,100 | 3,150 | 3,200 | 3,250 |
| Silver metal (thousand troy oz.) | 25,000 | 31,000 | 38,000 | 43,000 | 44,000 | 45,000 | 46,000 | 46,000 | 47,000 |
| Tin: Primary (metric tons) | 16,260 | 23,375 | 27,440 | 30,489 | 31,000 | 33,000 | 34,000 | 35,000 | 36,000 |
| Secondary (metric tons) | N.A. | 7,114 | 10,163 | 10,163 | 11,000 | 12,000 | 12,000 | 12,000 | 12,000 |
| Titanium: | | | | | | | | | |
| Concentrates (metric tons) | | | | | | | | | |
| Ilmenite | N.A. | N.A. | N.A. | N.A. | 380,000 | 400,000 | 410,000 | 410,000 | 420,000 |
| Rutile | N.A. | N.A. | N.A. | N.A. | 27,000 | 27,000 | 30,000 | 30,000 | 30,000 |
| Metal (metric tons) | 1,000 | 7,000 | 12,500 | 30,000 | 32,000 | 34,000 | 35,000 | 36,000 | 37,000 |
| Tungsten concentrates (metric tons) | 9,500 | 12,000 | 6,700 | 7,800 | 8,000 | 8,200 | 8,500 | 8,700 | 8,700 |
| Vanadium (metric tons) | N.A. | N.A. | 3,064 | 8,000 | 8,000 | 9,000 | 9,500 | 10,000 | 10,000 |
| Zinc: Primary | 395 | 480 | 610 | 690 | 720 | 735 | 770 | 770 | 785 |
| Secondary | N.A. | 55 | 70 | 75 | 80 | 80 | 80 | 80 | 80 |
| B. Non-Metals | | | | | | | | | |
| Asbestos | 600 | 745 | 1,065 | 1,900 | 1,850 | 1,900 | 1,945 | 2,020 | 2,150 |
| Barite | 130 | 230 | 285 | 350 | 400 | 450 | 475 | 500 | 500 |
| Cement, hydraulic | 45,500 | 72,400 | 95,200 | 122,057 | 124,246 | 127,056 | 126,956 | 123,019 | 125,000 |
| Diamonds: | | | | | | | | | |
| Gem (thousand carats) | 200 | 800 | 1,600 | 1,950 | 2,000 | 2,100 | 2,150 | 2,200 | 2,250 |
| Industrial (thousand carats) | 750 | 3,200 | 6,250 | 7,750 | 7,800 | 8,200 | 8,400 | 8,500 | 8,600 |

Table 2 (cont'd) USSR PRODUCTION OF SELECTED NON-FUEL MINERAL COMMODITIES

| Commodity | 1960 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|---|
| Feldspar | 200 | 230 | 250 | 280 | 280 | 290 | 300 | 310 | 310 |
| Fluorspar | 190 | 350 | 410 | 475 | 490 | 500 | 510 | 520 | 520 |
| Mica | N.A. | 33 | 38 | 42 | 43 | 44 | 45 | 46 | 46 |
| Nitrogen (N content of ammonia) | N.A. | 2,500 | 5,423 | 8,535 | 10,090 | 10,744 | 11,300 | 12,200 | N.A. |
| Phosphate rock: Ore | N.A. | 30,900 | 46,200 | 50,600 | 54,000 | 58,500 | 60,300 | 63,200 | 64,000 |
| Concentrates | N.A. | N.A. | 20,800 | 22,800 | 23,900 | 24,250 | 24,362 | 25,580 | 26,000 |
| Sulfur | 2,400 | 1,430 | 1,120 | 4,780 | 9,140 | 9,740 | 10,550 | 10,550 | 10,900 |

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1/ The USSR does not publish official statistics for its production or trade of most minerals; unless otherwise indicated, the data presented here are estimates provided by the Bureau of Mines, US Department of Interior. Estimates from the Central Intelligence Agency are generally in agreement with these data, except where specified below.

2/ Estimates for 1980 are preliminary.

3/ CIA estimates for USSR production of chromite are generally 30-75% higher than the Bureau of Mines estimates shown in the above table. The gap is based primarily on estimates of gross ore (CIA) versus recoverable metal content (Bureau of Mines).

4/ CIA estimates for USSR production of cobalt and nickel are about 50% higher than the Bureau of Mines estimates shown above.

(C) Table 3. USSR EXPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES: 1961, 1965, 1970, 1975-79
(metric tons unless otherwise specified)

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| A. Metals | | | | | | | | |
| Aluminum: | | | | | | | | |
| Unwrought metal | 86,000 | 229,000 | 368,900 | 502,360 | 520,000 | 540,000 | 560,000 | 560,000 |
| Semi-manufactures, rolled only | 13,500 | 42,100 | 131,000 | 101,500 | 110,000 | 100,000 | 110,000 | 110,000 |
| Chromium: Chromite ore and concentrate (thousand metric tons) | 438 | 748 | 1,200 | 1,170 | 975 | 673 | 900 | 750 |
| Cobalt: Primary forms | 300 | 200 | 0 | 0 | 0 | 0 | 0 | 0 |
| Copper: Unwrought, unalloyed | 60,400 | 93,100 | 123,100 | 205,620 | 220,000 | 220,000 | 240,000 | 240,000 |
| Alloyed | 2,300 | 3,300 | 8,700 | 4,240 | 7,000 | 7,000 | 7,000 | 7,000 |
| Semi-manufactures, rolled only | 13,600 | 10,700 | 18,700 | 17,615 | 18,000 | 18,000 | 18,000 | 18,000 |
| Iron and Steel: | | | | | | | | |
| Iron ore (thousand metric tons) | 16,283 | 24,138 | 36,100 | 43,620 | 43,120 | 40,946 | 42,000 | 41,000 |
| Pig iron (thousand metric tons) | 1,814 | 3,659 | 4,800 | 4,730 | 4,527 | 4,500 | 4,500 | 4,600 |
| Ferroalloys (thousand metric tons) | 155 | 205 | 326 | 418 | 418 | 420 | 420 | 420 |
| Steel semi-manufactures (thousand metric tons) | 2,816 | 4,813 | 6,260 | 6,430 | 6,722 | 6,500 | 6,500 | 6,600 |
| Lead: Unwrought | 102,300 | 102,500 | 92,400 | 98,900 | 99,000 | 95,000 | 95,000 | 95,000 |
| Manganese: Ore (thousand metric tons) | 896 | 1,020 | 1,200 | 1,410 | 1,342 | 1,352 | 1,186 | 1,250 |
| Nickel[1/] (thousand metric tons) | N.A. | N.A. | 19 | 13 | 11 | 11 | 22 | 26 |

Table 3 (cont'd) USSR EXPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| Platinum-group metals[1/] (thousand troy oz.) | N.A. | 1,000 | 1,535 | 1,361 | 2,036 | 1,954 | 1,878 | 2,145 |
| Titanium[1/] | N.A. | N.A. | 4.3 | 5.2 | 2.5 | 2.9 | 3.0 | 4.0 |
| Vanadium slag | N.A. | N.A. | 38,300 | 20,600 | 12,913 | 12,000 | 12,000 | 12,000 |
| Zinc: Unwrought | 116,200 | 132,700 | 95,100 | 100,600 | 100,000 | 100,000 | 100,000 | 100,000 |
| B. Non-Metals | | | | | | | | |
| Asbestos | 158,600 | 248,400 | 385,300 | 613,000 | 630,000 | 600,000 | 600,000 | 450,000 |
| Cement (thousand metric tons) | 408 | 2,016 | 3,200 | 3,300 | 2,882 | 3,438 | 3,548 | 3,500 |
| Fertilizer Material: | | | | | | | | |
| Apatite concentrates (thousand metric tons) | N.A. | N.A. | 5,600 | 5,800 | 5,900 | 5,900 | 6,000 | 6,000 |
| Nitrogenous: urea (thousand metric tons) | N.A. | N.A. | 222 | 499 | 677 | 925 | 1,035 | 1,200 |
| Phosphatic (thousand metric tons) | N.A. | N.A. | 651 | 530 | 533 | 628 | 703 | 750 |
| Potassic (thousand metric tons) | N.A. | N.A. | 3,100 | 5,985 | 5,567 | 6,024 | 5,771 | 6,000 |

Source: US Bureau of Mines, unless otherwise specified.

1/ Estimates for this commodity are from the Central Intelligence Agency; estimates not available from the Bureau of Mines.

(C) Table 4. USSR IMPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES: 1961, 1965, 1970, 1975-79
(metric tons unless otherwise specified)

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| A. Metals | | | | | | | | |
| Aluminum: | | | | | | | | |
| Bauxite (thousand metric tons) | 455 | 605 | 1,548 | 3,477 | 3,524 | 3,500 | 3,500 | 3,500 |
| Alumina (thousand metric tons) | N.A. | N.A. | 518 | 1,028 | 1,000 | 1,000 | 1,000 | 1,000 |
| Metal and alloys (thousand metric tons) | N.A. | N.A. | 1,600 | 3,540 | 3,000 | 3,000 | 3,000 | 3,500 |
| Cobalt 1/ | | | | | | | | |
| Concentrates (metal content) | N.A. | N.A. | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Metal | N.A. | N.A. | 500 | 500 | 500 | 500 | 500 | 500 |
| Copper: Unwrought metal | N.A. | 700 | 1,021 | 8,500 | 8,000 | 8,000 | 8,000 | 8,000 |
| Semi-manufactures | N.A. | 5,800 | 10,560 | 25,400 | 20,000 | 25,000 | 25,000 | 25,000 |
| Iron and Steel: | | | | | | | | |
| Pig iron (thousand metric tons) | 134 | 148 | 69 | 135 | 229 | 200 | 200 | 200 |
| Ferroalloys (thousand metric tons) | 16 | 6 | 6 | 40 | 33 | 35 | 35 | 35 |
| Lead: Ore | 33,900 | 30,600 | 50,700 | 54,674 | 41,544 | 49,818 | 47,695 | 6,000 |
| Unwrought metal | 39,500 | 47,900 | 38,800 | 56,700 | 60,000 | 55,000 | 60,000 | 80,000 |
| Tin: Ore and concentrates | N.A. | N.A. | N.A. | 470 | 2,000 | 2,000 | 2,000 | 2,000 |
| Metal, unwrought | N.A. | 5,800 | 8,169 | 9,700 | 8,000 | 6,000 | 7,000 | 7,000 |
| Tungsten, concentrate | 18,900 | 6,000 | N.A. | 1,700 | 2,000 | 2,000 | 3,000 | 3,000 |
| Zinc: Ore and concentrate | N.A. | 28,000 | 9,230 | 48,983 | 41,102 | 81,655 | 78,241 | 18,700 |
| Metal, unwrought | N.A. | 64,700 | 57,300 | 49,100 | 49,000 | 49,000 | 64,000 | 49,000 |

Table 4 (cont'd) USSR IMPORTS OF SELECTED NON-FUEL MINERAL COMMODITIES

| Commodity | 1961 | 1965 | 1970 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|
| B. Non-Metals | | | | | | | | |
| Barite | 71,100 | 105,200 | 151,700 | 330,000 | 350,000 | 400,000 | 450,000 | 450,000 |
| Cement: Hydraulic (thousand metric tons) | 1,740 | 67 | 481 | 811 | 552 | 636 | 592 | 600 |
| Fluorspar | 76,000 | 116,000 | 144,700 | 494,000 | 500,000 | 550,000 | 550,000 | 550,000 |
| Sulfur | 44,500 | 25,200 | 216,700 | 690,000 | 600,000 | 600,000 | 600,000 | 600,000 |
| Fertilizer materials: Phosphatic (thousand metric tons) | N.A. | N.A. | N.A. | 137 | 50 | 44 | 84 | 100 |

Source: US Bureau of Mines.

1/ (C) The Central Intelligence Agency estimates that annual imports of cobalt concentrates from Cuba and cobalt metal from Zaire and Zambia fluctuated only slightly throughout the 1970s. Estimates are not available from the Bureau of Mines.

(U) Table 6. COMBINED CENTRAL/SOUTHERN AFRICAN AND USSR PERCENTAGES OF WORLD'S PRODUCTION AND RESERVES OF SELECTED NON-FUEL MINERALS, 1979

| Commodity | Central/Southern Africa | | USSR | | Combined Percentages | |
|---|---|---|---|---|---|---|
| | % of Production | % of Reserves | % of Production | % of Reserves | Production | Reserves |
| Chromium Ore | 39 | 95 | 25 1/ | 3 1/ | 64 | 98 |
| Cobalt | 54 | 60 | 11 1/ | 14 1/ | 65 | 74 |
| Diamonds (industrial) | 60 | 88 | 28 | 4 | 88 | 92 |
| Gold | 57 | 42 | 22 | 30 | 79 | 72 |
| Manganese Ore | 21 | 37 | 46 1/ | 50 1/ | 67 | 87 |
| Platinum - Group Metals | 48 | 74 | 48 | 25 | 96 | 99 |
| Vanadium | 42 | 49 | 28 | 46 | 70 | 95 |

Source: US Bureau of Mines.

1/ Includes estimates for all communist countries.

(C) Table 5. USSR NET IMPORT RELIANCE FOR SELECTED NON-FUEL MINERALS AS A PERCENT OF CONSUMPTION IN 1975 AND 1979
(minus percents indicate net exports)

| Commodity | 1975 | 1979 | Principal Suppliers in 1979 |
|---|---|---|---|
| A. Metals | | | |
| Bauxite - Alumina | 33 | 39 | Guinea, Yugoslavia, Hungary, Greece |
| Cobalt[1/] | 36 | 24 | Cuba, Zaire, Zambia |
| Copper | -27 | -30 | |
| Gold | -140 | -100 | |
| Iron Ore | -23 | -20 | |
| Manganese | -20 | -15 | |
| Chromium | -128 | -44 | |
| Molybdenum[2/] | 18 | 25 | United States |
| Nickel[1/] | -7 | -12 | |
| Platinum - Group Metals | -40 | -45 | |
| Silver | -10 | -10 | |
| Tin | 25 | 21 | Malaysia, UK, Bolivia |
| Tungsten | 18 | 26 | China, Mongolia |
| B. Non-Metals | | | |
| Asbestos | -46 | -32 | |
| Fluorspar | 50 | 52 | Mongolia, China |
| Barite | 48 | 51 | Yugoslavia, North Korea, Bulgaria |

Source: US Bureau of Mines data.

1/ Percents based on Central Intelligence Agency estimates.

2/ Percents based on NATO Economic Committee estimates.