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INSTITUTE OF THE PEOPLES OF ASIA

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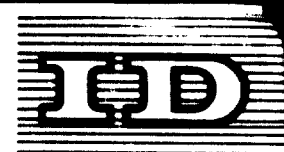
**IMPACT OF THE SCIENTIFIC
AND TECHNICAL REVOLUTION
ON THE DEVELOPMENT OF
THE MINERAL INDUSTRIES OF
ASIAN AND AFRICAN COUNTRIES**

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INFLUENCE OF THE TECHNICAL RESEARCH REVOLUTION ON THE
DEVELOPMENT OF THE EXTRACTIVE INDUSTRY IN ASIA AND AFRICA

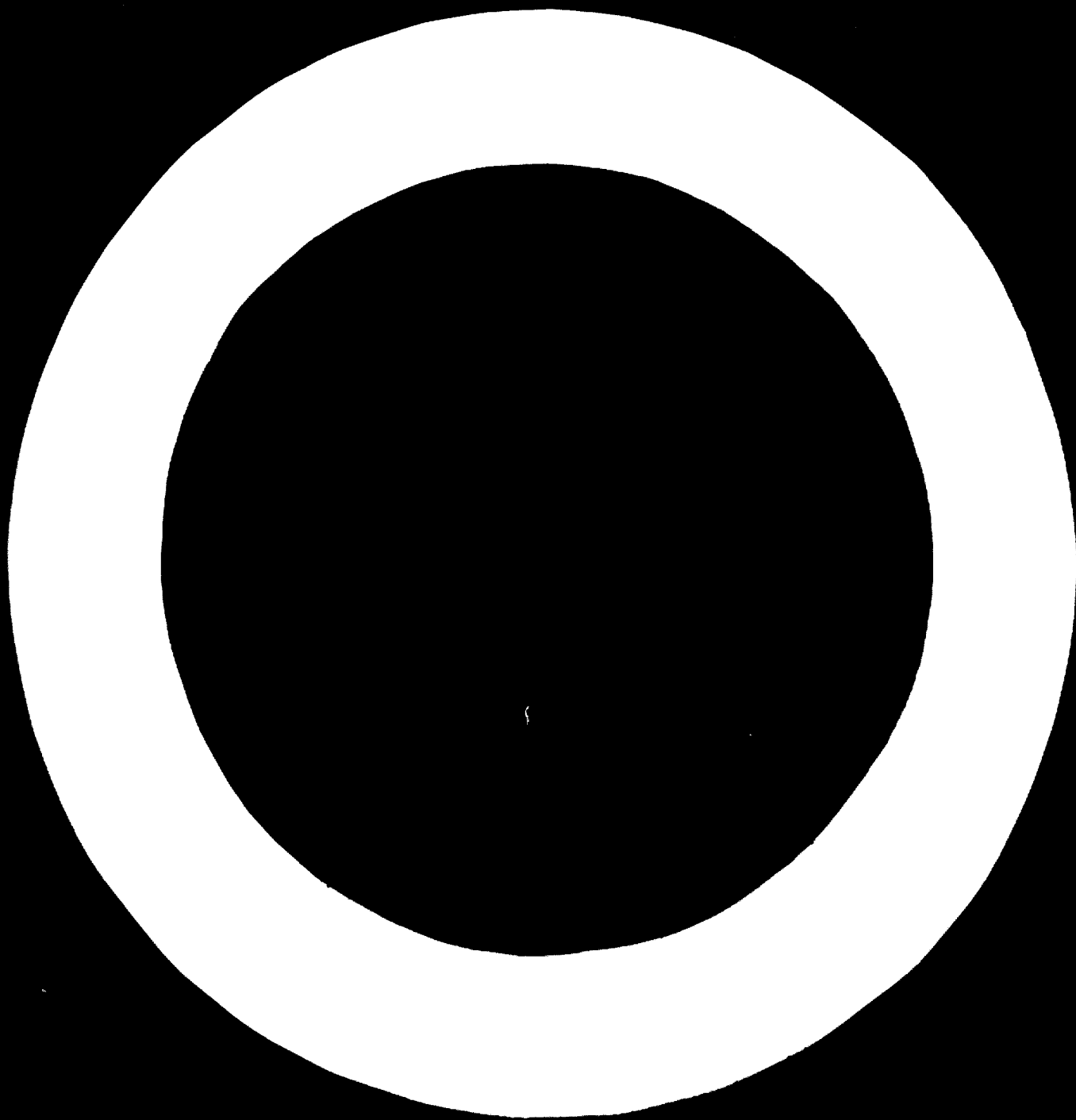
SUMMARY

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Submitted by
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1. The scientific-technical revolution that began in the mid-1950's brought about profound changes in production and utilization of raw materials and fuel as well as an increase in the production volume of the mining industry. A sharp rise in nomenclature has resulted from the use of various new types of minerals never used before, and new man-made materials that have been drawn into the sphere of industrial use. There have also been substantial qualitative changes in materials. In this connexion there has been a drastic rise in the production and utilization of certain non-ferrous and rare metals such as titan, beryl and germanium, as well as in the output of various alloys of ferrous and non-ferrous metals. New fields of application of basic types of raw materials and fuels have also been part of the scientific-technical revolution.

2. Technical progress does not always promote advancement of the mining industry. Achievements in the chemical industry, however, bring about a greater output of man-made materials with predetermined properties. As a result, the past few years have witnessed an ousting of non-ferrous metals by plastics and other substitutes in a number of production areas. Replacement of raw materials is accompanied by a cut back in the normal amount of consumption.

3. Slow-down in the mining industry is also due to expanded use of secondary materials such as scrap metal, which results in reduced demand for primary raw materials (ferrous and non-ferrous ores, etc.). There are also two contradicting trends in the distribution of mining industries. The results of geological surveys in North America and Western Europe, years of exploitation of deposits leading to their exhaustion and a need for minerals essential to modern technology all have contributed to the shift of mining centres to other continents.

4. Technological progress contributes to the expansion of bases of raw materials and also to a broader use of sources of raw materials not previously exploited for various reasons such as high production costs and remoteness of deposits.

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5. Scientific-technical progress has sharply increased the disparity, not only of countries of the world, but also of individual economic branches. There is a sizable gap between the volume of world consumption of agricultural products and the volume of mineral raw materials. Due to competition from substitutes, marketing of natural products is decreasing, and manufactured products is increasing.
6. Developing countries shoulder the burdens connected with the substitution for agricultural raw materials of artificial and synthetic products. A reduced demand for raw materials and lowering of prices have resulted. Millions of farms in Asian and African countries have been ruined. However, the mining industry has found itself in an advantageous situation as the growth of explored deposits has resulted in an output of basic minerals in developing countries that is higher than in developed capitalist countries.
7. Production of major mineral raw materials in Asia and Africa has grown faster than in the United States and Western Europe, and its share in world production has seen a systematic rise. Technological progress has brought about a slowdown in the production and use of only a small group of mineral resources.
8. Technological progress will undoubtedly promote the output of many types of minerals, deposits of which are concentrated in Asia and Africa (niobium-tantalum ores, zirconium and ilmenite), as well as the output of by-products (germanium, cadmium). Apart from agricultural raw materials, changes in the structure of utilization of minerals and fuel have been and will be favourable for developing countries.
9. From an analysis of the changes that have taken place under the impact of technological progress in the consumption of oil, ferrous and non-ferrous metals and a number of non-metallic minerals there is reason to suppose that the output of these minerals will expand substantially in developing countries of Asia and Africa and these countries will increase their role of supplying developed countries with mineral raw materials.

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10. Unlike the industrial revolution of the last century that led to a sharp increase of the demand for ferrous and non-ferrous metals, explored deposits of which were concentrated in Europe, the present scientific-technical revolution has expanded the use of oil, non-ferrous and rare metal, as well as of some non-metallic minerals, the biggest deposits of which are concentrated in Asia, Africa and Latin America.

11. The scientific-technical revolution is developing during the present period of liquidation of colonial systems of imperialism and rising competition between the systems of socialism and capitalism.

12. Following the emergence of new sovereign states, one of the major aims is to create independent national economies. To achieve this goal natural resources should be used, first and foremost, to meet domestic needs, particularly, the needs of industrial advancement.

13. In the interest of national economy, serious changes should be made in foreign trade. Freedom from dependence upon markets of metropolises should be achieved by expansion of trade in mineral raw materials and fuel among developing countries as well as with socialist states.

14. Mining industry advancement in developing countries calls for expanded and accelerated training of administrative-technical personnel and skilled workers in order to establish cadres of national origin. To ensure a balanced distribution of mining centres, geological surveys of remote areas are necessary. These surveys may not always coincide with the interests of foreign capital.

15. A developing country with a limited domestic market and meager resources frequently finds it impractical to construct a modern enterprise for mining and processing minerals. The united efforts of several developing countries however, can bring about the exploitation of mines, and construction of factories and enterprises for processing minerals.

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16. When a new sovereign state is formed it is vital for the country to have complete authority and control over the natural resources of its territory. Developing countries must have the right to establish state control over the activities of foreign capital invested in natural resources. This right is not in effect in all developing countries. In some countries foreign monopolies are in control of the mining industry. By indiscriminate exploitation of natural resources foreign monopolies have derived fabulous profits that are often so great that in a period of a few years investors are able to recover their initial investment.

17. Besides the outflow of capital remitted abroad in the form of profit and payment for services of foreign specialists, the rapacious activities of foreign monopolies lead to the exhaustion of natural resources in developing countries.

In the past few years there has been a substantial rise in the number of companies co-owned by the Governments of independent African countries (or by semi-state companies) and corporations of imperialist states. However, the ownership share of African States in many mixed companies is insignificantly low.

18. Well-founded, indeed, are the demands of these States for a bigger share in the profits of foreign companies and a greater part in management of enterprises that are fully or partially financed by foreign capital. The demand for establishment of government control over the activities of foreign capital in mining industry is also well-founded. By taking advantage of rivalry between foreign monopolies (private and state-monopolistic companies) some countries of Africa and Asia are able to improve conditions in their concessional agreements.

19. The position of foreign capital in the majority of mining industries is stronger than in the oil industry. To a large degree this is due to measures taken by developed capitalist countries to prevent nationalization of mines and to actions that, in every way possible, reduce payments to developing countries under concessional agreements.

20. Analysis of the activities of foreign private capital and state-monopolistic capital of the United States and other western powers shows that these activities are aimed not only to secure high profits but also to keep developing countries in the role of suppliers of mineral raw materials, especially materials that have become important in connexion with the scientific-technical revolution.

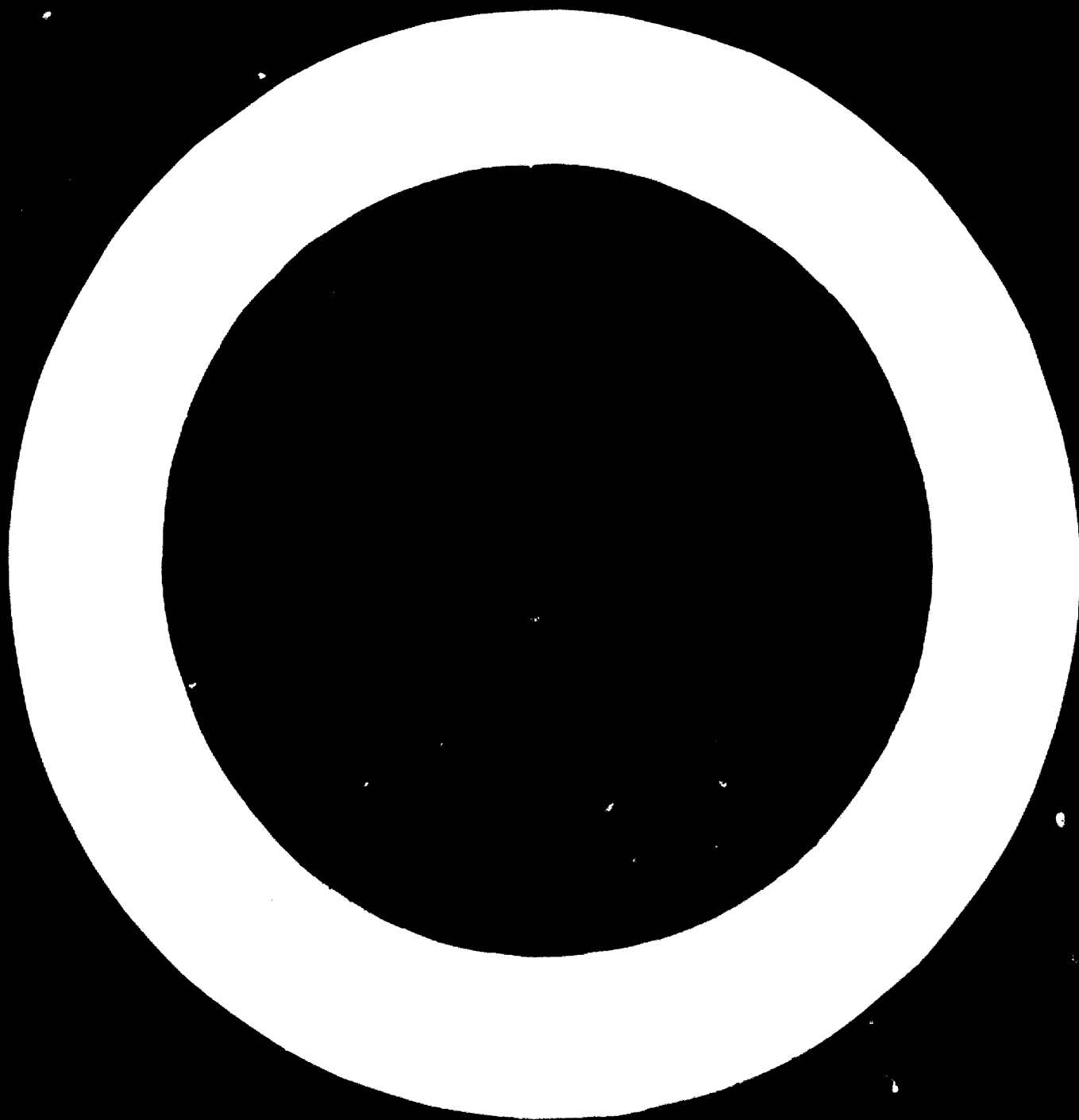
21. The chief aim of the aid given by the Union of Soviet Socialist Republics to developing countries is to assist them in the creation of an independent national economy and to ensure conditions for a rapid and effective implementation of social progress.

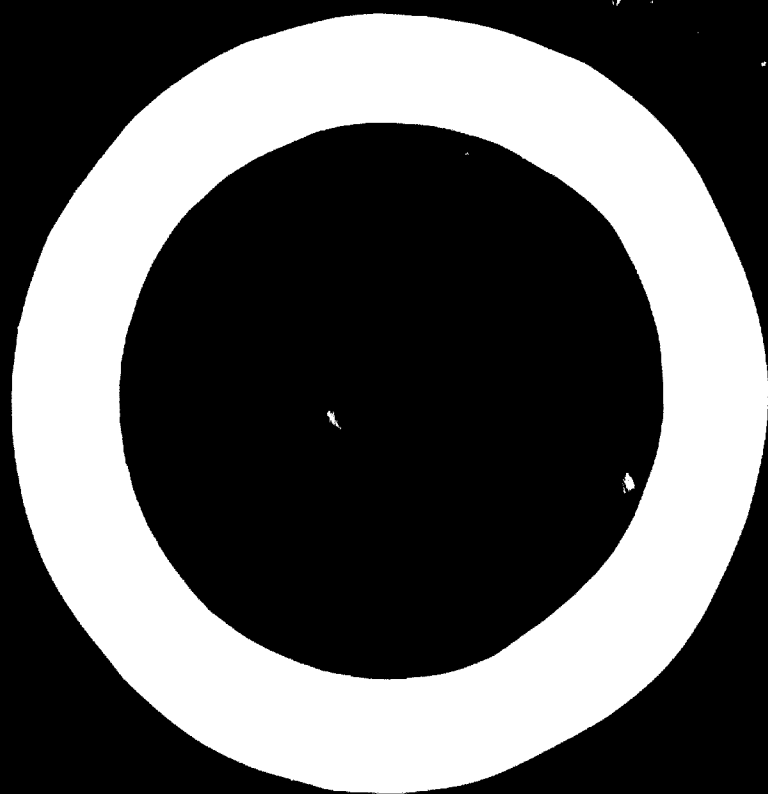
22. Some of the various forms of Soviet Union co-operation with developing countries are geological surveys, construction of enterprises for mining and processing minerals and supplying countries with modern equipment. The Soviet Union pays considerable attention to the training of national cadres.

23. In international organizations the Soviet Union offers constant support to the demands of developing countries for proper utilization of their natural wealth according to the needs of their national economy.

24. Implementation of these provisions in accordance with resolutions adopted at the twenty-first session of the United Nations General Assembly is essential to developing countries for utilization of their natural resources. In the interest of national economy, advancement of the mining industry should be promoted by individual countries or through agreements by groups of countries.

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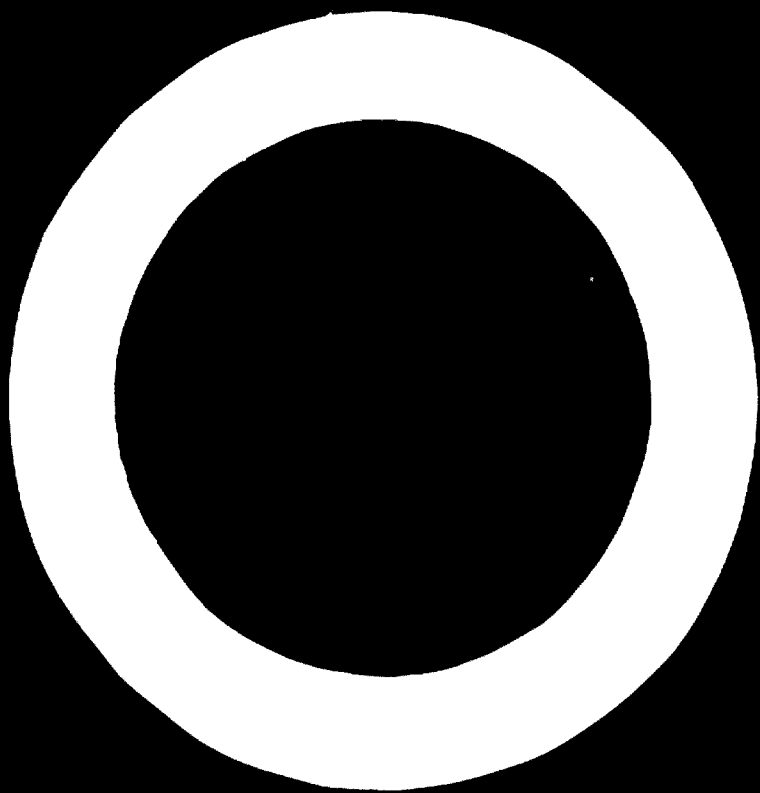
USSR ACADEMY OF SCIENCES

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IMPACT OF THE SCIENTIFIC
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ON THE DEVELOPMENT OF
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ASIAN AND AFRICAN COUNTRIES

Moscow 1967



1. The scientific and technical revolution which began in the middle of this century has brought about far-reaching changes in the production and consumption of raw materials and fuel. The growth in world output of the mineral industries has been accompanied by marked extension of the range of their products. Many minerals previously unused and synthetic materials are finding industrial application in various ways.

Important qualitative changes have taken place and are continuing. The rise of new branches of industry (atomic power engineering, radioelectronics, missiles, etc.) has brought new demands for mechanical strength and chemical and radiation stability. A new set of requirements and properties that have to be met by the materials employed in these fields has been established. This has led to a marked increase in the production and consumption of certain light and rare metals (such as titanium, beryllium, germanium, etc.) and, also, in the output of various alloys of ferrous and non-ferrous metals.

The mastering of outer space will clearly bring about a further extension of the range of minerals used in the latest techniques and lead to the development of new synthetic materials. At the same time basic raw materials and fuels are finding new uses. Thus, an ever increasing amount of oil is being used not only as motor fuel but also in the petro-chemical industry.

Technical progress does not necessarily encourage development of the extractive industries however. Advances in chemistry have increased production of synthetic materials possessing specified properties, which are often of a higher quality than the products made from natural raw materials and sell at lower prices. Consequently, plastics and other substitutes have gradually been supplanting non-ferrous metals in many fields. The displacement of raw materials is being accompanied by a reduction of their rate of consumption; the introduction of improved technology is leading to a reduction in the consumption of materials and power in the engineering of chemical industries and other branches of production. Development of the mineral industry is also being re-

tarded by the wider use made of secondary materials (metal scrap, etc.), which reduces the demand for primary raw materials (ores of ferrous and non-ferrous metals, etc.).

Two opposing trends exist also in the distribution of centres of extraction. The geology of the developed countries of North America and Western Europe has been well surveyed, and many years' exploitation of their long known deposits has led to their depletion or complete exhaustion, so that the demand for the minerals needed for the new techniques is promoting a shift of mining to other continents. Recent years have seen intensified exploitation of previously known deposits, and the discovery of new ones in Asia, Africa and South America. The natural conditions of these deposits (shallow occurrence, high quality of the raw materials and fuel extracted high, tenor of metal in the ores, etc.), make it possible to produce oil and ferrous and non-ferrous ores at costs several times lower than in Western Europe or the United States¹. This circumstance,

¹The cost of production of oil in 1961 was 1.53 dollars per barrel in the USA and 0.15 dollars in Near Eastern countries.-"Capital Investment by the

as well as the lack of many kinds of raw material in developed capitalist countries, leads them to a forced pace of prospecting and extraction in countries of the "third world".

At the same time, the effect of technical progress is to extend the raw material base, to increase the use of widely distributed sources of raw materials not previously utilised for various reasons (high costs of production, remoteness of deposits, etc.). Thus, off-shore extraction of oil and gas has been developing and the working of other mineral resources of the oceans is envisaged. Improved technologies have enabled ores with a low metal content to be worked profitably (e.g., copper in the United States, iron in Western Europe, etc.)².

World Petroleum Industry". The Chase Manhattan Bank Petroleum Department, November 1962. According to other accounts, the cost of oil in the Near East in 1962 - 1964 was about 7 to 8 per cent that in the USA. Petroleum Press Service, May 1966.

²The average copper content of ore amounts to 0.7 per cent in the USA and from 1.7 to 5.2 per cent in Zambia; the average iron content of ore amounts to 27 per cent in the Federal German Republic, 54 per cent in the Philippines, 64 per cent in Sierra Leone and 65 per cent in Mauritania. Minerals Yearbook, 1952,

Scientific and technical progress has not only extended the range of minerals used in industry but has also brought about a significant change in the importance of many of them in production and consumption. The rise of oil and gas in the fuel and power balance has been accompanied by a simultaneous fall in the role of solid fuel. The share of light metals (aluminium, titanium) in the balance of non-ferrous and rare metals is increasing steadily at the expense of the heavy ones (zinc, lead, tin).

2. The scientific and technical revolution has made inequality of development more marked not only among different countries, but also between different branches of their economies.

According to UN estimates for 1954 and 1964, the indices of world output of vegetable raw materials for technical needs and of mineral raw materials have changed as follows:

vol. 1, p. 346, 522; 1964, vol. 1, Washington, 1965, p. 420, 588.

Table 1

World production of raw materials
(1958=100)

	1954	1964
Vegetable raw materials		
for technical needs...	91	116
Mineral raw materials...	83	134

Source: Statistical Yearbook, 1965,
N.Y., 1966, p. 34

The gap between world consumption of agricultural and mineral raw materials is still more marked. Competition from substitutes has restricted the market for natural products, and part of their output has been stockpiled. Considerable changes have also occurred in consumption balances. The share of natural fibres in the world consumption of textile raw materials is falling steadily. Thus, consumption of cotton, wool and artificial and synthetic fibres was 15.1 million tons in 1960; by 1965 it had increased by 2,6 million tons, but cotton contributed only 170 thousand tons to this increase, while consumption of wool dropped by 30,000 tons³. The consumption of synthetic rubber

³Monthly Bulletin of Agricultural Economics and Statistics, 1967, No.2.

increased during the same period from 1.8 to 3.2 million tons and that of natural rubber - only from 1.6 to 2 million tons⁴.

Utilisation of various chemicals is increasing every year in the soap, paint and varnish industries, displacing conventional vegetable oils (peanut oil, palm oil, etc.) imported from Asia and Africa.

The burdens arising from the substitution of artificial and synthetic products for agricultural raw materials (reduction of markets, falling prices) bear mainly on the developing countries, and millions of peasant holdings in Asia and Africa have been ruined. On the face of it, the position of the extractive industries would seem to be more favourable. Although large new deposits of a number of minerals have been discovered in Western Europe and the USA during the last twenty years (gas in Holland and France, uranium in the USA), the growth in explored resources and mining of the most important commercial minerals has been greater, however, in the developing countries than in the developed capitalist countries.

⁴Rubber, Statistical Bulletin, London, 1966.

In spite of significant fluctuations in different years, due to the fall in prices and other circumstances, the rate of production of the most important minerals has generally been higher in Asia and Africa than in the USA and Western Europe, and their share in world production is rising systematically. The production and consumption of only a small group of minerals has been retarded by technical progress (see Appendix).

Production of the minerals listed in the appended table continued to grow over the last three years (1964-1966) (with the exception of tin and antimony), especially in Asia and Africa. The drop in the demand for these two metals is a result of the introduction of substitutes and new technological processes (new methods of super-thin plating of sheet steel in the manufacture of tinplate, etc.). Output of industrial diamonds and gem stones, concentrated in Africa, was higher in 1966 than in previous years, and by some estimates exceeded 30 million carats. However, considerable changes have occurred in the consumption of industrial diamonds, which make up more than half the total output of diamonds, and a curtailment of production can be expected in the near future. An

ever-increasing amount of artificial diamonds is being put on the world market; their production increased from 2 million carats in 1958 to 7 million carats in 1965, the contribution of the USA to this rise being 1.3 million carats and 5.4 million carats respectively⁵. Artificial diamonds are also being made in the United Kingdom, Japan, Sweden, Ireland, and the United Arab Republic. As a result of this mass production, the price of artificial diamonds, by the end of 1964 was 2.65 dollars or about half what it was in 1958, and 15 cents below the price established by the diamond syndicate. This competition had already considerably reduced U.S. imports of natural diamonds in 1965. Still wider use of artificial diamonds will cut demand for natural technical diamonds in the coming years and, consequently, will seriously affect the economics of those developing African countries that are their main producers (Congo-Kinshasa, Sierra Leone, Ghana, Tanzania).

Technical progress will undoubtedly encourage expansion of the mining of many minerals, deposits of which are concentrated

⁵Diamant, 1966, IV.

in Asia and Africa (such as niobium-tantalum ores, zirconium and ilmenite), as well as the production of various by-products (germanium, cadmium). In contrast to agricultural materials, the changes taking place in the structure of the consumption of minerals and fuel are favourable for developing countries. From year to year coal is losing its position in the world fuel and power balance, while consumption of oil and gas - and in the long-term, of nuclear fuel - is growing. The main coal fields of the world are concentrated in Western Europe and the United States, while the major oil fields are in the developing countries of Asia and Africa.

Economists forecast that world output of oil will reach 2,100 million tons in 1970, and 3,400 million tons in 1980, mainly through growth of output of Asian and African countries⁶. Output of uranium has dropped sharply in recent years, but a considerable increase in output can be expected in the next decade as a result of the extensive building of atomic power stations. Taking into account the exploi-

⁶Economic Commission for Africa. The petroleum industry in the West African sub-region E/CN14/LNR/110 11 July 1966, p. 17.

tation of deposits in Gabon and the Central African Republic, the discovery of new deposits in Tunisia, Pakistan and other African and Asian countries, and the intensive geological search for deposits of uranium ores, it can be assumed that the weight of these countries in world output will rise significantly.

The tendency toward further growth in the consumption of aluminium and titanium favours an increase in output of bauxites and ilmenites - the basic raw material for the production of these metals - and the establishment of a light-metal industries in developing countries based on utilisation of their rich hydropower resources (especially in Africa).

Analysis of the changes being brought about by technical progress in the consumption of oil, ferrous and non-ferrous metals, and certain non-metallic minerals, leads us, then, to the conclusion that output of these minerals will be considerably extended in the developing countries of Asia and Africa, and that the importance of these countries as suppliers of minerals to developed countries will grow.

3. In contrast to the industrial revolution of the last century, which caused a sharp rise in demand for the ferrous

and non-ferrous ores of which the explored deposits were concentrated in Europe, the modern scientific and technical revolution has extended the use of oil and light and rare metals, and of certain non-metallic minerals of which the largest deposits are mainly located in Asia, Africa and Latin America. As a result, the development of the industry of the United States, Western Europe and Japan depends considerably on supplies from developing countries. The chromium, manganese and cobalt requirements of the U.S. iron and steel industry in 1964 were completely or almost completely met by imports from developing countries. The share of these countries in the supply of diamonds and non-ferrous and rare metals to the engineering and chemical industries by developing countries was also considerable⁷.

The proportion of imported minerals in the total consumption of West European countries is much higher even than in the United States. Annual production of oil in Western Europe during 1963 - 1966 was 18 million tons, while imports of oil increas-

⁷Statistical Abstract of the United States, 1966, Washington, 1966, p. 705.

ed from 242 million tons in 1963 to 366 million tons in 1965. Consumption of manganese, chromium, cobalt, diamonds, asbestos and other minerals in the United Kingdom, France, the German Federal Republic, and Italy was completely, or nearly completely, met by imports.

During recent years the proportion of their supplies of non-ferrous and rare metals (copper, tin, antimony, bauxites, etc.), and of asbestos, graphite, phosphorites and other non-metallic minerals coming from Asia and Africa has markedly increased.

A relative drop in the share of raw materials in their imports and a considerable absolute rise in the volume of imports of specific minerals is characteristic of the developed capitalist countries. From 1950 to 1964 imports of oil, ores of ferrous, non-ferrous and rare metals, and of non-metallic minerals have increased several times over.

The economy of Japan is even more dependant on supplies of minerals from developing countries; imports from these countries fully, or nearly completely cover the requirements of Japan for oil, iron ore, bauxite, phosphorites, and uranium and other kinds of nuclear materials.

More than half the products of the engineering, electronics, and electrical industries of Japan are made from imported metals. Asian countries were already major suppliers of minerals before the war and continue to hold this position in the post war period in spite of a marked increase in Japanese imports from Africa.

Summing up the effect of the scientific and technical revolution on the production and consumption of minerals, it may be noted that the market for most of them has increased in spite of the fact that some are being supplanted by synthetic materials. At the same time it should be emphasised that the range of materials utilised by new branches of industry (atomic power, the electronic and missile industries, etc.) has been considerably extended.

During the next 10 to 15 years a considerable increase in the demand for liquid fuel, bauxites, uranium and other kinds of nuclear fuel can be expected, as well as a certain rise in the consumption of ores of ferrous and some non-ferrous and rare metals (copper, cobalt, and others), accompanied by a drop in the demand for tin, zinc, and technical diamonds.

Essential changes are also to be anticipated in the geographical distribution of the mining of certain kinds of fuel and raw materials.

4. The scientific and technical revolution is developing in circumstances of abolition of the colonial system of imperialism, of further strengthening of state monopoly capitalism, and of competition of the socialist and capitalist systems. Unless these factors, which also affect the scientific and technical revolutions, are taken into account it is impossible either to correctly assess the present state of the mining industry in the countries of Asia and Africa, or trace the outlines of their further development. The achievement of political independence by developing countries is having an ever increasing effect on changes in the structure and location of the extractive industries. In the period of colonial domination, the natural resources of these countries were exploited solely in the interests of the metropolitan countries. Nearly the whole output was exported, while the administration and technical personnel of the mines was made up of foreigners.

One of the main tasks following the formation of new sovereign states is to create independent national economies. To this end it is necessary, first of all, to utilize their natural resources to satisfy home needs, and, in particular, to promote industrial development. This involves a break with the structure of the extractive industries established in the colonial period, and a real change in the allocation of mining production between the needs of developing the economy and exports.

The interests of the economy also call for fundamental changes in foreign trade; a weakening of the one-sided dependence on the markets of the former metropolitan countries, through extension of trade in minerals and fuel between developing countries and with socialist states.

As the export of minerals and fuel is an important source of the foreign exchange required for the development of industry and other branches of the economy measures are advisable to improve the return from it (by a transition to export of semi-finished products and articles rather than unprocessed raw materials). When the development of individual branches of the extractive industries is being planned,

it is desirable that the changes in world consumption resulting from technical progress be taken into account. The achievements of science and technology will have to be used so that the developing countries can exploit their natural wealth through their own resources in the interests of their own economies.

The employment of modern equipment and techniques is also essential for improving the competitiveness of minerals exported by them. High cost of production stimulate the production of substitutes and the utilisation of low-grade ores in the developed countries. This naturally restricts sales possibilities on foreign markets. The home markets of most developing countries are still limited due to the backwardness of their industry and low purchasing power. More than half the developing countries have populations of five million or less and an average per capita annual income of a score or so of dollars.

The installation of new equipment causes a relative or absolute drop in the number of workers employed in the given branch of industry. In general, however,

employment in the extractive industries of developing countries is rising owing to the growth in output of different kinds of minerals. An extension of mining of gold, diamonds and certain other minerals by diggers and prospectors contributes greatly to the rise in employment.

Development of the extractive industries in the interests of the developing countries calls for wider and accelerated training of national personnel: administrators, technicians and skilled workers. At present specialists are being trained in higher and secondary educational institutions and training centres in the Asian and African countries, and abroad under bi-lateral agreements with capitalist countries. In accordance with the decision of the 21st Session of the U.N. General Assembly (A/Decis/2518/XXI/28.XI.1966) foreign investors exploiting the natural resources of developing countries are responsible for proper and accelerated training of local personnel at all levels and in all fields connected with the industry. The efficiency of this measure, however, depends to a great extent on the control over its fulfilment established by the governments of the developing countries.

The Soviet Union and other socialist states are giving great assistance in the training of personnel from these countries.

The replacement of foreign administrative and technical personnel in the extractive industry of most developing countries is proceeding slowly and on a limited scale. In order to solve this problem it would seem desirable not only to expand the activity of existing institutions, faculties and training centres but also to organise new ones serving the needs of individual countries or groups of countries. As these countries themselves have only limited possibilities, recourse might be made to the educational system and resources of UNESCO and other U.N. institutions for accelerating the training of engineers, technicians, administrative personnel, and skilled workers.

For a more uniform distribution of mining, geological exploration needs to be undertaken in remote districts which foreign companies are not interested in exploiting. This could be solved by setting up geological services organised on a national or regional basis.

In many cases the erection of large

modern plants to mine and dress minerals designed to meet the needs of a single country is made impractical by the narrowness of the home market and limited finances. A reasonable solution might be obtained by uniting the efforts of several developing countries to build and exploit mines, plants, and groups of enterprises.

5. The newly established national states have acquired indisputable sovereignty over the natural resources of their country, but the developing countries do not all exercise their rights, in particular, the right to establish government control over the activities of foreign capital exploiting their mineral wealth. In certain countries foreign monopolies are the real masters of the mining industry and gain enormous profits that are frequently sufficient to cover the initial investment in the course of a few years.

In 1963 the direct investments of American companies in the oil industry in Asia (mainly in the Near East) amounted to 1925 million dollars; in 1964 they were 2054 million dollars and in 1965 reached 2384 million dollars; profits for the same years were respectively:

893; 960 and 921 million dollars. Thus, over only three years the profits of these oil companies exceeded their investment by nearly 400 million dollars⁸.

The profits of the mining industry in Africa were at a lower level and in 1965 were 55 million dollars on investments of 361 million dollars. It should be noted, however, that part of the production of mines controlled by American monopolies was delivered directly to their steel works in the USA (iron ore from Liberia, etc.).

During the fifty years of its existence, the Anglo-American Corporation of South Africa has not only expanded territorially but has also immensely increased its profits. At present its enterprises for mining gold, uranium, copper, and other non-ferrous metals, diamonds, and coal, are located not only in the Republic of South Africa but also in Zambia and Rhodesia. By 1962 its paid-up capital had increased ten-fold through re-investment

⁸"Statistical Abstract of the United States", 1965 and 1966, Washington, 1965, p. 859; 1966, p. 847. Survey of Current Business, 1966, September, p. 34-35.

and totalled 20 million rands. The net profit for the same year after taxes, was 19.6 million rands⁹.

Thus, even according to available official data and company reports, the profits gained by foreign oil and mining monopolies in the course of a few years have exceeded the investments involved. In our opinion the actual profit is much higher than stated as the ploughing back of profits has not been taken into account in many cases.

In addition to the loss of capital owing to the transfer of profits overseas and payments to foreign specialists, etc., the developing countries suffer depletion of their resources due to the rapacious nature of the foreign monopolies. Natural resources are not unlimited of course, and intensive exploitation leads to the exhaustion of deposits or to a worsening of the quality of ores extracted. Unlike vegetable materials, minerals are not renewed. The more intensive the mining, the poorer becomes the country where the mineral deposits are being exploited.

⁹Mining Year Book, London, 1964,

p. 63-68.

About 9 million tons of copper have been extracted and sent abroad during the 33 years' activity of foreign companies in Zambia. As a result, the average metal content in the ores extracted has dropped considerably in recent years.

The intensive exploitation of manganese deposits in India during the colonial period has caused a reduction in the reserves of high-grade ore, and this in turn has brought about a constant fall in the output and export of manganese over the past decade.

6. Joint companies owned both by the governments of independent African countries and by governmental and semi-governmental bodies and foreign corporations in imperialist countries have received a considerable vogue in recent years.

The reason behind the establishment of these joint companies is the lack of funds and local technical personnel in the developing countries. The value of their formation depends on the conditions imposed by the governments of developing countries: the proportion of the shares belonging to the governments, the scale of the return in their favour and the government control established over the activities of the company.

The share of African countries in many of these companies is small. As an example, French and Italian shareholders have a controlling interest in the "Societe de Mine de Cuivre de Mauritanie" ("Micumo"), a joint-stock company exploiting copper deposits in Mauritania, while the government of the country has only a 12.5 per cent share. The share of the government of Senegal in certain joint-stock companies is even lower. In such conditions, the governments of the developing countries are practically ordinary stockholders receiving an insignificant part of the profits and the actual owners are foreign companies, which benefit in a number of ways from the privileges of state capital (tax privileges, reduction of transport charges, etc.).

Therefore, the governments of these states are quite justified when they demands a greater share in the profits of foreign companies, demand greater participation in the management of enterprises wholly or partly financed by foreign capital and the establishment of government control over the activities of foreign capital in the extractive industries. Realisation of the sovereign rights of

these countries is in practice held back by the opposition of foreign monopolies, and by defence of their interests by the governments of developed capitalist countries.

Several Asian and African countries have set up national state companies to handle the exploration, mining, processing, and sale of oil on the home and foreign markets (Iran, Saudi Arabia, Algeria and others). Foreign private capital, however, still dominates the oil industries of these countries. Developing countries have made considerable progress in increasing their income by raising the base prices on which payments are made by the oil monopolies.

The state sector of the economies of developing countries importing oil has been strengthened by the establishment of governmental companies, often in conjunction with foreign capital, to market oil on the home market (Ceylon, India, etc.).

Oil refineries have been built in most of the newly formed states of Asia and Africa with the participation of state capital.

This greater use of their oil wealth in the interest of their economies is due to the following:

(a) the developing scientific and technical revolution, and extension of the use of oil not only as a fuel, but also as primary raw material in the chemical industry;

(b) the greater dependence of West European countries and Japan (which have insignificant resources of liquid fuel) on supplies of oil from developing countries;

(c) the combined efforts of oil-producing countries to create their national oil industries and to increase the payments made by the oil companies;

(d) the assistance given by the Soviet Union and other socialist states for the development of national industries and in guaranteeing the sovereign rights of the developing countries in the exploitation of their natural wealth.

Some Asian and African countries have used the competition between foreign monopolies (private and state monopoly companies) to improve the terms of concessions. Agreements concluded in recent years between developing countries and state-owned concerns in Italy (ENI) and France (ERAP and others) provide for a controlling holding by the governments of

the developing countries in joint companies and a higher scale of payments. This indicates that an improvement in the terms of the concessions of the oil monopolies in favour of the developing countries can also be expected.

The position of foreign capital in most branches of mining is stronger and stabler than in the oil industry. This is due mainly to the measures that have been taken by developed capitalist states to prevent the nationalisation of mines and the various methods adopted to reduce the payments due in accordance with the terms of concessions.

The developing countries experience constant pressure from the monopolies, which are always striving to reduce the payments due by curtailing production or cutting the price of the minerals. Depending on the prevailing state of the market and the political situation in the different developing countries, the monopolies, operating in several countries, deliberately reduce output in one country and increase it in another, thus causing sharp fluctuations in the volume of production (for example, of copper extracted in African and Latin America countries, of oil in Near East countries, etc.). The mono-

panies also widely use technical progress to substitute artificial and synthetic materials for natural ones, to utilise scrap metal, and to reduce rates of consumption of raw materials, etc. As a result, the dependence of the industrial capitalist countries on supplies of minerals is not so great as with oil. The sale of non-ferrous metals, etc., from strategic reserves by the U.S. General Services Administration also has a negative effect on the extractive industries of developing countries.

7. Analysis of the activity of foreign private and state monopoly capital from the USA and other Western powers indicates that its aim is to preserve the developing countries as suppliers of minerals and, in particular, of those that have become specially important as a result of the scientific and technical revolution, and to make high profits. In accordance with this, the foreign investment policy of these powers is directed mainly toward developing the production of minerals for export. In many cases, the monopolies restrict development of the fuel and raw material base of these countries in order to preserve them as markets.

In contrast to the Western powers, the USSR aims to encourage developing countries through its assistance to develop independent economies and to establish the conditions for rapid and effective social progress. The cooperation of the USSR with developing countries is based on mutual benefit and equality. As concerns the utilisation of natural resources, Soviet aid is directed toward promoting the discovery of new deposits, the extension of mining of minerals needed for the development of a national industry and improvement the foreign trade balance (replacement of imports, improved return from exports, etc.).

The forms of Soviet cooperation are various: geological exploration, the construction of new enterprises for mining and dressing ores, and the supply of modern equipment for them. The Soviet Union also pays much attention to the training of national cadres.

Soviet geologists are prospecting for minerals in India, Pakistan, Iran, Syria, Guinea, the United Arab Republic, Congo

(Brassaville) and other countries in Asia and Africa. They have helped to discover new deposits which are used for home needs (fuel, building materials, etc). Exploitation of coal, oil and gas fields discovered in India with the help of Soviet geologists has considerably extended the fuel and power base of that country. New mineral deposits have been discovered in the United Arab Republic, Guinea, Mali, Iran, Syria, etc.

The major problem of creating a national industry to process raw materials is also being solved in several countries in close cooperation with the USSR through the building of oil-refineries and steel works in the United Arab Republic, Algeria, Ceylon, India, Iran, and other countries.

Realising the great importance of training local personnel, the Soviet Union has organised wide-spread training of local inhabitants at the enterprises being built, and in special training centres. Several higher educational institutions have been, or are being built with Soviet aid. An African Oil and Gas Centre, incorporating an oil and gas institute and technical school, has been founded in Algeria, and technological institutes have

been built in Guinea, Burma and other developing countries. Engineers, technicians and skilled workers from these countries are also being trained at the industrial enterprises and educational institutions in the Soviet Union itself.

It also deserves mention, that the demands of the developing countries for the utilisation of their natural resources in accordance with the needs of their economies are constantly supported by the Soviet Union in international organizations. When the sovereign rights of developing countries over their natural resources were discussed in 1952, 1960 and 1962 at the United Nations, the Soviet Union was always in favour of recognition of these rights. The Ukrainian Soviet Socialist Republic, Poland and Yugoslavia joined with the United Arab Republic, Tanzania, Burma, Iran, and other developing countries, in introducing a draft resolution on the inherent sovereignty of countries over their natural resources. The resolution, adopted by the XXI session of the U.N. General Assembly in November 1966 on the basis of this draft, confirmed that the natural resources of every country are to be exploited in accordance with the

laws and decrees of that country, and recognised the right of all countries and in particular of developing countries to participate and to extend their share in the management of enterprises fully or partly financed by foreign capital and to a greater share in the privileges and profits obtained from these enterprises on a just basis, due consideration being given to the requirements of development and interests of the country's people as well as to the attainment of mutually acceptable agreements and calls on all countries supplying this capital to abstain from any actions liable to obstruct the exercise of this right¹⁰.

Other paragraphs of this resolution contain important provisions relating to the sovereign rights of developing countries: the right to decide the method of exploitation and sale of their natural wealth and other resources, and also an appeal to developed countries to refrain

¹⁰ Resolution of the XXI session of the General Assembly of the United Nations (on the report of the Second Committee (A/6518). A/Pes/2158 (XXI). 28.XI.1966, New York.

from selling on the world market non-commercial stocks of raw materials liable to produce a negative effect on the foreign exchange receipts of developing countries.

8. Implementation of these provisions will play an important role in the utilisation of their natural resources by developing countries. At the same time it would be advisable to adopt a number of measures to promote development of the mineral industries in the interests of individual developing countries or, by agreement, of groups of countries. These measures might include the following steps:

(a) to take into account changes in the consumption of minerals (volume of production, qualitative indices, etc. etc.) due to the scientific and technical revolution when drawing up long-term plans of development;

(b) to intensify geological prospecting in order to increase the output of minerals that have the best long-term prospects as regards exports, or are required to meet the needs of the economies of individual countries of sub-regions;

(c) to organise national or sub-regional geological services for countries where they do not exist;

(d) to pose the question of obliging foreign companies to hand the results of geological surveys over to the governments of the developing countries on whose territory the surveys have been made;

(e) to establish government control over the exploitation of mineral deposits to ensure more efficient utilisation of natural wealth and to improve safety measures;

(f) to train local geologists, mining engineers and technicians, and administrative personnel for the extractive industries through the establishment of institutes and centres serving the needs of the individual countries of sub-regions or continents, which would have an important effect on the utilisation of resources;

(g) to examine the problem of improving the working conditions of prospectors and diggers.

The developing countries can count on the cooperation of the socialist states in carrying through the measures outlined here.

Appendix

Output of Commercial Minerals
(1948-1963)

	Unit of measurement	Capitalist world				Asia			Africa	
		1948	1963	%	1948	1963	%	1948	1963	%
Oil	mill. tons	436	1071	245.5	63	367	582.5	2	57	2850
Iron ore ^x	thous. tons	86,433	251,000	291.1	1618 ¹	17,853 ¹	1103.3	3362	11,718	348.5
Manganese ore ^x	"-"	1200	3100	258.3	271	527	194.5	583	1641 ²	281.5
Cobalt ore ^x	tons	6400	14,200	221.8	...	...	...	4235	10,172	240.2
Copper ore ^x	thous. tons	2250	4050	180.0	22 ¹	108 ¹	490.9	421	989 ³	234.9
Bauxites	"-"	8000	24,000	300.0	...	1605	...	142 ⁴	1900	1338.0
Phosphorites	mill. tons	17	38	223.5	...	...	...	6	13	216.7
Tin concentrates ^x	thous. tons	149	144	96.6	82	91	110.9	23	20	87.4
Diamonds (gem stones and industrial diamonds)	mill. carat	10	28	280.0	...	...	...	10	26 ^{ix}	260.0

^x content of metal^{ix} estimated

- 1) without Japan
- 2) including the Republic of South Africa - 567.6 thousand tons
- 3) including the Republic of South Africa - 54.8; Rhodesia - 16.8 thousand tons
- 4) exports from Ghana

Sources: Statistical Yearbook 1965, New York, 1966.

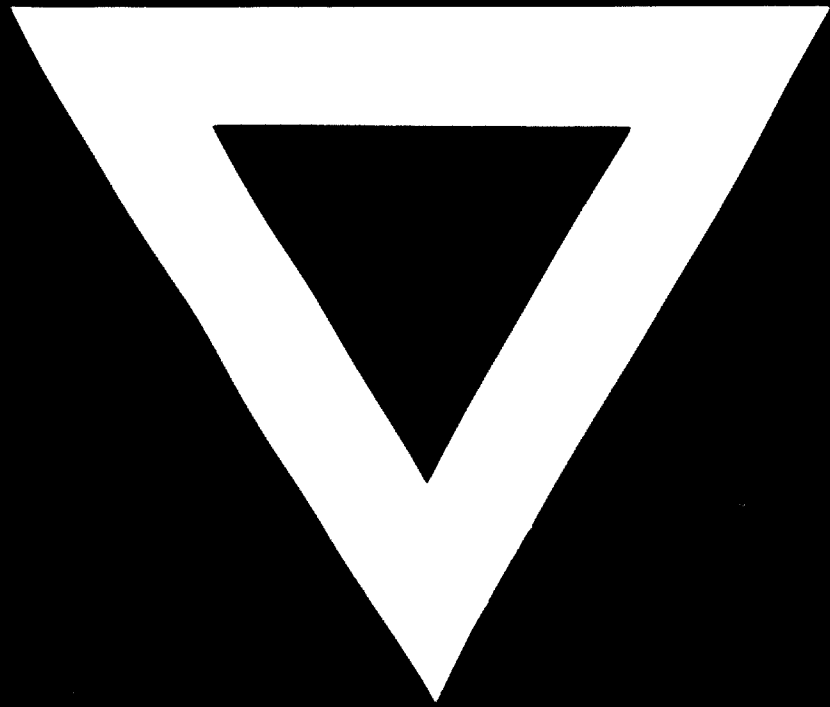
Petroleum Press Service 1949, 1965, January.

Statistical Summary of the Mineral Industry, 1948-1953, London, 1955.

Mining Annual Review, London, 1966.

Yearbook of the American Bureau of Metal Statistics, 1965, New York, 1966.

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