

SOVIET INDIAN COOPERATION SERIES



N. RODIONOV

**SOVIET-INDIAN  
JOINT  
COMMISSION**  
PROSPECTS  
OF ECONOMIC  
COOPERATION  
BETWEEN  
USSR AND INDIA

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# **SOVIET-INDIAN JOINT COMMISSION**

## **Prospects of Economic Cooperation Between USSR and India**

By  
N. RODIONOV

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## INTRODUCTION

The traditional friendship between the peoples of the USSR and India has deep historical roots.

In our times Soviet-Indian relations in the field of politics, economy, culture, science and technology, and in various spheres of social life are characterised by their especially fast and multi-sided development, and are a convincing proof that such close and versatile friendly ties can unite states with different social systems when their policies are inspired by the ideals of struggle for peace and security of peoples, against aggression and all forms of colonialism, and when the relations between them are built on the principles of mutual respect, sovereign equality and non-interference in internal affairs.

It was V. I. Lenin who formulated the idea of unity of the revolutionary movement in Russia with the struggle for national and social freedom waged by the peoples of the East, including India. Lenin evinced great interest in the upsurge in the freedom struggle in India at the turn of the 20th century and in the first anti-imperialist activities in the country.

The victory of the Great October Socialist Revolution marked the beginning of a qualitatively new stage in national-liberation movements. The first socialist state in the world acted as an ally and a bulwark of the peoples of the East who became a more and more active force in the revolutionary transformation of the world. Lenin substantiated the idea of the unity of socialism and national-liberation movement as a mighty factor of world revolutionary process. He considered that "after the period of awakening of the East a time will come in the modern revolution for the participation by all the peoples of the East in deciding the destiny of the entire world, in order not to become only the object of enrichment" (*Collected Works*, Vol. 39, p. 328).

Lenin firmly believed in the inexhaustible creative powers of the Indian people, in the victory of their struggle for freedom and

independence, and that the Indian people would make a great contribution in eliminating world colonial system and in the revolutionary transformation of the world. Lenin's foresight was completely corroborated by the history of national-liberation struggle in India, by the practice of Soviet-Indian cooperation, and by the development and strengthening of the friendship between the peoples of the two countries.

The links between India's national-liberation movement and revolutionary struggle in Russia go back to 19th century and the beginning of 20th century. Such prominent leaders of Indian freedom struggle as Mahatma Gandhi, Bal Gangadhar Tilak, Bipin Chandra Pal, Ajoy Ghosh and scores of others often emphasised the great influence of the revolutionary movement in Russia on their views and on the methods of struggle of the Indian people.

The example of the Soviet people, who had created a socialist society in a country where social exploitation was hand in glove with national oppression, had a tremendous impact on the formation of ideology of the leaders of the Indian freedom movement and on the deepening of friendly feelings between our two countries. The great son of India, Jawaharlal Nehru, who did much for strengthening Indo-Soviet friendship, often spoke about it. In 1927 he visited the Soviet Union to see everything through the eyes of a keen observer. Later he wrote : "Practical achievements of the Soviet Union also made an extremely deep impression. I didn't doubt that the Soviet Revolution had advanced human society by a great leap and had lit a bright flame which could not be smothered, and it had laid the foundations for that new civilisation towards which the world could advance...". The prospects of future development of the entire world, including an independent India, he linked with socialism and not capitalism.

In 1947 as a result of the freedom struggle the Indian people won independence. This news was received in the Soviet Union with great satisfaction and deep feelings. Here a highly symbolical fact is that the understanding between the governments of the USSR and India about the exchange of diplomatic representatives, at the level of ambassadors, was reached on April 13, 1947, i.e., several months before the 15th of August, before the official proclamation of Indian independence.

In the conditions of the independent development of India, friendly ties between our two peoples acquired a qualitatively new



content. It can be said without exaggeration that the Soviet Union's multi-sided relations with India during this period developed at rates higher than with any other developing country.

The conclusion on August 9, 1971 of the Treaty of Peace, Friendship and Cooperation between the two countries was a logical outcome of this development. In one of his speeches L.I. Brezhnev noted : "Our relations with India constantly strengthened during the entire period of its existence as an independent state. It is precisely as a result of this development that the Soviet-Indian Treaty of Peace, Friendship and Cooperation was born."

The conclusion of the Treaty, which put the relations between the two countries on a solid political and legal basis, met the interests of the peoples of both the countries and reflected their striving for broad, multi-sided cooperation and deep interest in ensuring economic and social progress, peace and security of peoples.

The Treaty opened up wide prospects for further development of cooperation between our two countries, including economic cooperation. Article VI of the Treaty says : "Attaching great significance to economic, scientific and technical cooperation between them, the High Contracting Parties will continue strengthening and broadening mutually-beneficial and multilateral cooperation in these fields..."

A practical step in implementing this article was the conclusion on September 19, 1972 of an agreement on the creation of an Inter-Governmental Soviet-Indian Commission. The tasks of the Commission are the study of the possibilities of further development of economic and scientific-technical cooperation, preparation of proposals on possible directions of cooperation for submission to the governments of both the countries for their approval, thrashing out of questions arising during the implementation of the operative Soviet-Indian agreements in these fields, as well as questions connected with ensuring normal functioning of joint projects, etc. On parity basis, each government nominates the Chairman and members of its side. At present the Chairman of the Indian side is India's External Affairs Minister Mr. A.B. Vajpayee, and of the Soviet side—Vice-Chairman of the USSR Council of Ministers I.V. Arkhipov.

Since its formation the Commission has taken a number of important decisions promoting further development of economic and scientific-technical cooperation between the USSR and India.

Of great significance for the further development of relations

between the USSR and India are regular contacts between Soviet and Indian statesmen and mutual visits by the leaders of the two countries.

The visit to India by the General Secretary of the CPSU Central Committee, President of the Presidium of the USSR Supreme Soviet, L.I. Brezhnev in 1973 was of historic importance. The frank and friendly exchange of opinions at the highest level during the visit facilitated the deepening of mutual understanding. It provided yet another testimony to the fact that the Soviet Union and India have already learnt to understand each other, and to value their friendship.

A number of important documents were signed during the visit: the Joint Soviet-Indian Declaration ; Agreement on further development of economic and trade cooperation between the USSR and India, as well as the Protocol defining a number of concrete steps for its realisation; the Agreement on cooperation between the USSR State Planning Committee and the Indian Planning Commission and the Consular Convention between the two countries.

The outcome of the visit by L.I. Brezhnev aroused a feeling of deep satisfaction among the peoples of the two countries. Foreign correspondents covering the visit pointed out that the significance of the visit went far beyond normal diplomatic contacts between the two countries which had just concluded a friendship treaty. It was stressed that the relations between the Soviet Union and India had covered a new path of development and entered new avenues.

Speaking during the visit, L.I. Brezhnev said :

“A new phase has started in the development of Soviet-Indian relations ; the well-meaning peaceful coexistence has been enriched with a deep and close friendship, by active and multi-sided cooperation...I think I have the right to speak about the special character of Soviet-Indian relations. This special character stems from long-standing traditions of friendship and the developed forms of cooperation.

“It also stems from the fact, and I would like to stress it, that the ties of friendship that bind our two countries together do not hold us back from joining the rest of the mankind, but facilitate in increasing our positive contribution to the common cause of improving the entire world situation.”

## DELINEATION AND STATE OF SOVIET-INDIAN COOPERATION

Soviet-Indian economic and technical cooperation has been successfully developing since 1955 when the first inter-governmental agreement was signed for the construction of the Bhilai Steel Plant. The very fact of the conclusion of this agreement was not just a chance event. It was a logical step stemming from the durable friendly relations which had been shaped by that time between the two countries, and from the policies conducted by the governments of the USSR and India.

After gaining independence India needed to accelerate the industrialisation of its economy. Having visited the Soviet Union in 1927, Nehru saw that the experience of industrialisation in the USSR could help India in solving this task. He wrote :

“Russia can help us find a way out from the tremendous difficulties plaguing the world today. She especially interests us, since the conditions of her life differ not much from those in our country, Both India and Russia are huge agricultural countries and the process of industrialisation in them has just begun : both are poor and illiterate. If Russia finds a satisfactory solution to these problems, it would ease our work.”

These words were written in 1927. By 1955 the Soviet Union had solved its problems and the word “if” lost its meaning.

Moreover, the Soviet Union, despite the fact that the country had passed through a difficult period of restoration of its economy after World War II, and true to the principles of internationalism, did its best to render political and material help to young independent states that had appeared on the world map as a result of the crisis in the world colonial system.

Defining the basis of the policies of our state in relation to the peoples of colonies and semi-colonies, V. I. Lenin wrote :

“We shall bend all our efforts in order to come closer and merge with the Mongols, the Persians, the Indians and the Egyptians and we consider it our duty and our interest to do this... We shall try to render these backward and oppressed peoples selfless assistance, i.e., help them to turn towards the use of machines, the alleviation of labour, towards democracy and socialism.”

The behest of the founder of the Soviet state formed the basis of the principles of economic and technical cooperation of the Soviet Union with developing countries, and it has been consistently implemented at all the stages of its existence.

The historic significance of the Soviet Union's cooperation with developing states lies in the fact that, having undermined the monopoly of the imperialist world in economic links with former colonies and semi-colonies, it led to the emergence of a new type of international economic relations and division of labour between countries with varying levels of development and different social systems; division of labour based on mutual benefit, equality and respect of sovereignty.

In the struggle for a just system of international economic relations, the liberated countries widely use these new principles which are reflected in a number of documents adopted by the UN, and, particularly, in the “Declaration on the Establishment of a New International Economic Order”.

The Declaration reflects the legitimate aspirations of the developing countries—elimination of economic exploitation by former colonial powers, and by the industrialised nations of the West, and creation of favourable conditions so that the developing countries could overcome their economic backwardness. With these aims they are striving for the establishment of a more justifiable correlation between prices of raw material and finished product, broadening of transfer of advanced technology to the developing countries, reform of the world currency and credit system, and restriction on the activity of world monopolies.

The Statement of the Soviet Government, published on October 5, 1976, “On the Restructuring of International Economic Relations” says that “the Soviet Union treats with understanding this broad programme of measures reflecting the vital and long-term interests of developing countries and supports its basic orientation.”

The approach of the Soviet Union to cooperation with young

states basically differs from the "help" by imperialist powers which is directed at realising the policies of neo-colonialism. In the strategy of the latter, "help" has as its basic aim the transformation of the recipient country, with its abundant natural resources and large labour force, into a reserve of imperialism. It is done now by closely linking the economies of the former colonies and semi-colonies to the production processes in the citadels of capitalism and relegating the former to a subordinate position.

Such a modification of expansion of imperialism, which replaced the early policy of counteraction to the formation of national industry, is dictated by the striving to get firmly established in the economy of developing countries, to try in the conditions of the changed balance of forces in the world and the development of scientific-technical revolution to turn the former colonies and semi-colonies into, what is called, the "industrial-raw material appendages".

The Soviet Union has an entirely different approach which can be summed up thus : to assist in the production of any product with the purpose of increasing the internal resources of the developing state for the creation of an independent and balanced national economy capable of acting in the international division of labour as an equal partner.

It is in this broad context of the USSR's economic relations with developing countries that Soviet-Indian economic and technical cooperation should be seen and evaluated.

The Agreement on the construction of the Bhilai Steel Plant is not only a landmark in the history of Soviet-Indian relations; it was, in reality, an example of new relations between a developed and a developing state. This is how it was evaluated by former Indian Ambassador to the USSR, Mr. K.P.S. Menon, a noted public figure of India and an associate of Nehru :

"...imperialist powers treated the peoples of Asia and Africa as hewers of wood and drawers of water; the role of these people was confined to the production of raw material for Western countries which they bought at lower prices, took it out to their countries, turned it into industrial goods and sold out at a fantastic profit... The first blow at this system of economic relations between Asia and Africa, on the one hand, and Europe and USA, on the other, was struck by the project of building

the Bhilai Plant. It was followed by other projects of industrial enterprises all over India intended to make her self-sufficient.”

The period of the realisation of the Soviet-Indian economic and technical cooperation since the signing of the Agreement on construction of Bhilai Steel Plant is characterised by repeated growth of its volume and the emergence of new trends of forms and projects of cooperation. The cooperation acquired a character of multi-sided and stable economic ties and turned into an important factor for further development of friendship and mutual understanding between the peoples of the Soviet Union and India.

The construction of more than 70 modern enterprises in India with Soviet assistance in various branches of industry and agriculture and the setting up of a system for training national technical cadre were major contributions to the enhancement of the economic potential of the country and to the strengthening the state sector of the economy.

Among the projects of Soviet-Indian cooperation four enterprises are in the metallurgical industry, 10 in coal and mining, 13 in oil, 15 in machine-building, 11 in power generation, six in agriculture and 14 in educational and scientific fields. The capacities of these enterprises, after attaining the projected level of production, will allow India to make per annum 8 million tonnes of steel, 100 thousand tonnes of aluminium, to extract 6.5 million tonnes of iron ore, 13 million tonnes of oil, about 20 million tonnes of coal, to produce 125 thousand tonnes of metallurgical, mining and other heavy machinery, manufacture thermal and hydraulic turbines and generators for them with an overall capacity of 2.7 million KW, and produce in considerable quantities electro-energy, medicaments, equipment and other products.

The basic form of cooperation is the Soviet Union's technical and economic assistance in designing, construction and commissioning of enterprises of national economy through deliveries of Soviet machinery, deputation of specialists, training of Indian cadres and extension of other services.

Since 1955 through 1978 India and the USSR have signed a large number of inter-governmental agreements, protocols and other documents on various aspects of economic cooperation.

A special place among these is occupied by the Agreement on further development of economic and trade cooperation between the

USSR and India, concluded on November 29, 1973 during the visit of L. I. Brezhnev to India. In this Agreement the sides reaffirmed the desire to develop and strengthen the economic cooperation between the two countries on the basis of the principles of sovereignty, territorial integrity, non-interference in the internal affairs, equality and mutual benefit. The Agreement envisages, in particular, cooperation in the field of ferrous and non-ferrous metallurgy, in the field of exploration, extraction and processing of crude oil, natural gas, coal and other minerals, in energetics, petro-chemical, ship-building and other branches of industry, in agriculture, as well as in the field of the training of cadres. Great attention is paid also to new forms of cooperation, including production cooperation, cooperation in third countries and the improvement of credit relations between the two countries. The Agreement, in fact, reflects the mutual understanding on the necessity of developing cooperation based on the principles of international division of labour and mutual supplementation of economic potentials of the two countries.

During L. I. Brezhnev's visit another agreement was signed between the State Planning Committee of the USSR and the Indian Planning Commission on the creation of a Soviet-Indian research group for cooperation in the field of planning, in the framework of the Inter-Governmental Soviet-Indian Commission. The basic function of this group is the exchange of experience and knowledge in economic forecasting, in yearly, mid-term and perspective planning, in controlling and evaluation of planned programmes and projects. The group will also study and present reports on questions which will be entrusted to it by the Inter-Governmental Commission.

It is interesting to note that, recalling nearly thirty years hence his visit to the Soviet Union in 1927, Nehru said :

“The thing that impressed us most was the idea of planning and...the tremendous changes that took place in the regions of the Central Asia (the reference here is to the Soviet Central Asian Republics—author), which were extremely backward.”

The Soviet example of quick eradication of poverty and disease through economic planning obviously, had a direct impact on the decision of the Indian National Congress, as early as in 1939, to create a National Planning Committee under the chairmanship of Jawaharlal Nehru with Professor K. T. Shah as its Secretary, for the preparation of a plan of the reconstruction of free India. It is

gratifying to note that at present the planning bodies of the two countries are actively cooperating.

The Soviet Union renders technical assistance to India in the construction of industrial and other projects mainly on the basis of long-term state credits. The availability of credits to India for the purpose of economic development is envisaged by 13 basic inter-governmental agreements. The overall volume of credits given to India is to the tune of 1,294.4 crore rupees. Besides, Soviet organisations render technical assistance in the construction of enterprises in the public and private sectors on conditions of commercial credits worth about 550 crore rupees.

The first inter-governmental Soviet-Indian Agreement was signed on February 2, 1955 and according to its terms the Soviet Union gave India a credit of 101.93 crore rupees for the construction of the first phase of the Bhilai Steel Plant. The credit, to be repaid in 12 years, carried an annual interest of 2.5 per cent. The repayment would start a year after the completion of the deliveries of machinery necessary for commissioning of the plant.

The Agreement opened up new possibilities for further development of Soviet-Indian cooperation in setting up production complexes in key branches of Indian economy.

The *second Soviet credit* worth 93.71 crore rupees was made available in accordance with the Agreement of November 9, 1957 on terms similar to the first. This credit was to be used for the construction of the Ranchi Heavy Machine-Building Plant, the Mining Equipment Plant and the Optical Glass Plant in Durgapur, the coal-extracting complex at Bokaro and the first phase of the Neyveli Thermal Electric Station with a capacity of 250 MW.

The *third Soviet credit* was granted to India on May 29, 1959. The credit worth 14.99 crore rupees was fully utilised for the construction of enterprises of pharmaceutical industry: the antibiotics plant in Rishikesh with a capacity of 290 tonnes, the Synthetic Drugs Plant at Hyderabad with a capacity of 850 tonnes of medicines and 150 tonnes of semi-products a year, and the Surgical Instruments Plant in Madras with a capacity of 2.5 million pieces of instruments a year.

Considering quicker returns on the investments in projects of pharmaceutical industry compared to enterprises in heavy industry, the credit was granted for 7 years on 2.5 per cent interest.



The *fourth Soviet credit* granted through the Agreement of September 12, 1959, was intended for financing the projects of the Third Five-Year Plan of India, which included :

1. Expansion of Bhilai Steel Plant up to the capacity of 2.5 million tonnes of steel a year.
2. Expansion of Neyveli Thermal Power Station from 250 to 400 MW.
3. Stepping up the capacity of Ranchi Heavy Machine-Building Plant from 45 to 80 thousand tonnes of machinery per year.
4. Stepping up the capacity of Durgapur Mining Equipment Plant from 30 to 45 thousand tonnes of equipment per year.
5. Construction of the Precision Instruments Plant in Kota.
6. Construction of Obra Thermal Power Station with a capacity of 250 MW.
7. Construction of Korba Thermal Power Station with a capacity of 200 MW.
8. Construction of Barauni Oil Refinery with a capacity of 2 million tonnes.
9. Construction of Bharat Heavy Electricals in Hardwar.
10. Completion of prospecting and drilling works for oil and gas.

The credit was worth Rs. 281.14 crores with repayment over 12 years at an annual interest of 2.5 per cent.

The *fifth Soviet credit* worth Rs. 18.78 crores was granted on September 28, 1959. It was intended, as desired by the Indian Government, for covering additional expenditures connected with the construction of the Barauni Oil Refinery. The credit was granted on similar terms as the previous ones.

The *sixth Soviet credit* was the second one for financing various programmes of development in the Third Five-Year Plan of India. It was granted on February 21, 1961 for the sum of 93.75 crores of rupees and was to be used for the construction of a large hydro-electric power station at Bhakra on the right bank of the river Sutlej, for an oil refinery at Koyali with a capacity of 2 million tonnes a year, for a coal washery at Kathara, and for prospecting and drilling works at Ankleshwar, Cambay and other oil de

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About the same time, talks were held on the utilisation of the remaining amounts of the credits granted through the earlier-signed

agreements, and a decision was taken on financing at their cost a number of new projects and expansion of the existing ones. These sums helped cover the expenses on the expansion of the capacities of the Koyali and Barauni oil refineries up to 3 million tonnes each, on the construction of the sixth blast-furnace of the Bhilai Steel Plant and on the expansion of the thermal electric power station at Neyveli up to 600 MW, as well as other projects.

The *seventh Soviet credit* worth Rs. 166.67 crores was granted on January 25, 1966 and was fully intended for the construction of the Bokaro Steel Plant on identical terms as the earlier ones.

The *eighth Soviet credit* was granted on December 10, 1966 and was intended for financing the projects of the Fourth Indian Five-Year Plan. These projects included an aluminium plant at Korba with a capacity of 100 thousand tonnes of aluminium a year, an oil refinery at Mathura with a capacity of 6 million tonnes a year, further geological prospecting and drilling work for oil and gas, construction of a pit for iron ore at Dalli, underground railway in Calcutta, projects of coal industry, hydro-electric station at Lower-Sileru with a capacity of 230 MW, autonomous faculties and technical secondary schools, a tropo-scatter link between the USSR and India, as well as others. The credit was worth Rs. 250 crores on terms analogous to the previous ones.

The *ninth Soviet credit* was granted on April 27, 1977 for the sum of 208.25 crore rupees. It was granted on more favourable terms than before : repayment spread over 20 years including a grace period of 3 years at 2.5 per cent annual interest rate. This credit is for financing new, prospective projects of cooperation in the field of ferrous metallurgy as well as projects of coal industry at deposits of energy coal of Singrauli and Raniganj, including the section Jayant with a capacity of 10 million tonnes, Jhanjhra-1 mine with a capacity of 2.8 million tonnes, the central mechanical workshop for capital repairs and the manufacture of 21 thousand tonnes of machinery a year.

In addition to the above listed credits the Soviet Union also rendered aid gratis to India. In 1955 the USSR handed over to India as a gift agricultural machinery and equipment worth Rs. 1.24 crores to set up a farm at Suratgarh in Rajasthan. Later, the Soviet Union gave gratis agricultural machinery worth 1.5 crore rupees for 5 more farms at Jullundur (Punjab), Hissar (Haryana), Raichur (Karnataka), Cannanore (Kerala) and Jarsuguda (Orissa).

In the field of technical education the Soviet Union assisted on gratis basis in setting up the Indian technological Institute at Powai, Bombay, by deputing professors and lecturers and by supplying laboratory and educational equipment worth 5.7 million rupees.

The long-term Soviet credits are usually subjected to repayment over 12 years excluding a grace period of 1 year, at an interest rate of 2.5 per cent. In contrast to the credits of capitalist countries the repayment of Soviet credits, as a rule, begins after the completion of the deliveries of machinery necessary for the commissioning of the project. Thus, in actual practice, the repayment period since the beginning of the utilisation of the credit, is spread over 15-16 years including a grace period of 3-4 years.

The Soviet Union was the first country in the world to grant India long-term credits on soft terms which compelled the developed capitalist countries to gradually soften the terms of their credits.

It is well known, for instance, that the West German firms offered India a credit for the construction of a steel plant in Rourkela on the terms of 12 per cent annual interest with part of the shares in the plant. It was only after the Soviet Union gave its consent for rendering assistance in the construction of the Bhilai Steel Plant after granting credit on favourable terms, that the FRG and Britain agreed to make considerable allowances in the terms of loans for the construction of steel plants at Rourkela and Durgapur.

Another advantage of Soviet credits compared to those of the capitalist countries is that their repayment is not in hard currency, but in Indian rupees which are fully used for purchasing Indian goods for export to the USSR. These terms of Soviet credits exercise a positive influence on the growth of Indian trade, since on the one hand, there is an economy of hard currency which can be used for increasing Indian imports, and on the other—a guaranteed and stable market for Indian goods.

Thanks to this, the development of economic and technical co-operation between the two countries has had a positive influence on the growth of Soviet-Indian trade turnover which increased from, for instance, 80 crore rupees in 1960 to almost 800 crore rupees in 1977.

The financial terms of the credits should better be seen in the context of the economic results of their utilisation. The profits from the projects of Soviet-Indian cooperation in the 1974/75-1975/76 fiscal years exceeded by 32 times the interest-bearing payment on

Soviet credits and by 4.7 times the over-all payments on them, i.e., the utilisation of Soviet credits not only created sufficient resources for their repayment, but also ensured considerable investment resources for Indian economy.

The conditions of Soviet-Indian cooperation strictly conform to the principles of national sovereignty of India. In contrast to the investments by capitalist countries in India, the right of ownership as also the control of the projects of Soviet-Indian cooperation completely rest in Indian hands. In this context the Soviet Union, as was noted by L.I. Brezhnev, "does not seek profits for her, does not hanker after concessions, does not achieve domination and does not press for war bases".

Economic relations between the USSR and India are built on the principles of mutual benefit. The Soviet Union utilises the rupee repayments to purchases goods of India's traditional export : tea, jute, jute articles, coffee, spices, tobacco, skins, etc. Of late, there has been an expansion of Soviet purchases of industrial products, including pig iron, accumulators, garage equipment, power cable and such consumer goods as shoes, cotton and woollen fabrics, garments and linen.

Soviet-Indian cooperation is concentrated on the development of the most vital branches of modern industry. More than 90 per cent of Soviet economic assistance goes to the share of metallurgy, fuel-energetics and machine-building. These branches are a kind of "strong points of development" for the entire economy and accelerate the growth of other branches of industry, agriculture, transport, etc.

In the process of industrialisation creation of separate uncoordinated enterprises can lead to the emergence of sharp disproportions resulting in large surplus of ready products or an unjustified increase in the imports of raw material and components. That is why in the Soviet-Indian cooperation special attention is paid to the construction of mutually-supplementary enterprises having between themselves direct economic links and with multi-branch industrial complexes.

With Soviet assistance India has built two such complexes covering a majority of collaboration projects. The first 26 of them includes more than 34 enterprises in ferrous and non-ferrous metallurgy, coal industry, heavy and electro-technical machine-building, and electro-energetics; the second—10 projects in oil-extracting and oil-processing industry.

Soviet-Indian cooperation is developing in full conformity with the planning strategy of economic growth of India aimed at achieving self-sufficiency in the shortest possible period.

The majority of these projects are large enterprises of national importance. The production capacities built with Soviet assistance in India are comparable in their dimensions with the industrial potential of a number of developed states.

The increase of production in key branches of industry at these projects was a powerful factor for the growth of India's industrial potential. In the 1960/61-1975/76 fiscal years the share of these projects accounted for 46.3 per cent increase in the production of steel, 40.6 per cent increase in the production of rolled metal, 66.1 per cent increase in oil-extraction and 43.1 per cent increase in its processing. 90 per cent increase in the production of heavy machine-building and 50 per cent increase in the production of electro-machine-building.

A majority of projects of Soviet-Indian cooperation belongs to the import-substituting branches. In the 1975/76 fiscal year out of the gross production of these projects worth about 1,990 crore rupees the import-substituting production accounted for 1,100 crore rupees. In other words, in the absence of these projects the Indian imports in that fiscal year would have been of the order of 11 billion rupees or 22 per cent higher than the actual expenditure.

An important feature of Soviet-Indian cooperation is the all-round utilisation of the available local resources which ensure a continuous reduction in the share of imports in the capital investments in these projects. A proof of this is the example of the Bhilai Steel Plant. During the construction of the first phase of the plant with a capacity of 1 million tonnes the Indian deliveries accounted for 10 per cent of machinery, 23 per cent of metal structures and 7 per cent refractory material. During the expansion of plant up to a capacity of 4 million tonnes the Indian enterprises delivered more than 60 per cent of the necessary machinery, 100 per cent of metal structures and 90 per cent refractory material. The same holds true of the share of participation by Indian industry in the construction of the Bokaro Steel Plant. Here it is necessary to take into account the qualitative aspect of the matter: for the expansion of the Bhilai plant and the construction of the Bokaro plant more modern, complex and perfect machinery is being used than for the first phase of

the Bhilai Steel Plant which testifies to qualitative growth of Indian industry.

A characteristic peculiarity of Soviet-Indian economic cooperation, like the cooperation with other developing countries, is that the Soviet Union renders assistance, mainly in the creation and the strengthening of the state sector in leading branches of economy.

The creation of the public sector in India was a logical result of the policies of the country which stepped out after the achievement of independence on to the road of economic independence and social progress. As early as in 1948 the spheres of the activities of public and private sectors were clearly divided by a resolution on industrial policy of the Indian Government. Exceptional rights for the public sector were reserved for the construction of new industrial enterprises in key branches of economy : ferrous and non-ferrous metallurgy, heavy machine-building, coal extraction, oil industry, energetics and a number of other branches.

The role of the public sector in India's economy is steadily increasing. And this is quite natural, since the public sector provides an opportunity to mobilise the means on a national scale to solve the vital problems facing the country.

At present the railway, posts and telegraph, ports, civil aviation and large irrigation projects are in the public sector. The state enterprises make about 70 per cent of the entire steel, manufacture a major part of the heavy machinery for power generation, produce 90 per cent of electricity, extract 70 per cent and process 98 per cent oil. With the nationalisation of 14 major banks in 1969, the state now has more than 85 per cent of all the bank reserves. A considerable part is played by the public sector in internal and, especially, in the external trade of the country.

The public-sector enterprises not only meet the internal demands of the country for many important types of products, as a result of which their import has been considerably reduced. In certain cases India has become an exporter of goods which the country used to import. Products of the Bhilai and Bokaro steel plants as well as lathes of India's largest machine-building company Hindustan Machine Tools Ltd., are extremely popular in many countries of the world. The capitalist countries for a long time, did not agree to give India help in the construction of enterprises in the heavy industry, especially in the public sector, and put up conditions unacceptable to India. Only under the influence of the ever-increas-



ing importance of the Soviet-Indian cooperation in the construction of public-sector enterprises in key branches of industry were they compelled to review their position.

Soviet-Indian economic cooperation plays a considerable role not only in the development of key branches of economy in India, but also in the solution of big social problems facing the country, including an equal development of productive forces on the territory of the country as well as of the backward regions, increase in employment and reduction in unemployment, raising of the cultural level and prosperity of the people.

The majority of projects are situated in less-developed regions, close, as a rule, to the sources of raw material. To these belong, in the first place, the steel plants in Bhilai and Bokaro, oil refineries in Koyali and Barauni, electric stations in Neyveli, Korba, Obra and Bhakra, heavy electrical plant at Hardwar, antibiotics plant at Rishikesh, and others. The construction of these projects, to a considerable extent, facilitated the fast development of productive forces of the given regions, increased employment, created conditions for preparing local cadres of qualified specialists and the development of stable economic links with other regions of the country. It also facilitated the development of various infrastructure. All this in the final count positively influences the growth of living standards of the people.

At the same time, with the construction of industrial enterprises, urban-type settlements are being built, complete with cultural and social establishment, which will, in reality, become the "beacons" of a new life.

The construction of steel plants at Bhilai and Bokaro is a brilliant example of the transformation of former backward regions. The construction of these projects in the small, sleepy villages made it possible to build well-appointed towns, lay roads, set up schools, hospitals and various cultural establishments. For instance, in Bhilai town and in the settlements at the Rajhara and Nandini pits there are 38 schools where 20 thousand children are studying. Classes are conducted there to teach illiterate workers and members of their families. A majority of workers and employees of the plant live in modern, well-equipped houses. The city has several hospitals, dispensaries, first-aid centres, cinema halls, stadiums and a large number of eating houses and other related establishments. In 1973 the general manager of Bhilai Steel Plant, Mr. Ahuja, in an interview to

the newspaper *Hitavada* stressing the significance of state enterprises for raising people's well-being, pointed out : "Bhilai provides for the workers and employees of the plant free education, free medical aid, house rent allowance and free school uniforms for children, whose parents get a salary of less than 500 rupees per month.

The amount of the house rent for the workers of the plant accounts for 7.5 to 10 per cent of the salary, depending upon its size. House rent is not charged from some low-paid categories of workers. There is a special committee looking after the organisation of cultural activities of the workers by setting up clubs, sports sections, charitable societies, etc. There are consumers' cooperatives at the plant which, to a large extent, satisfy the needs of the families of workers in foodstuffs. The plant also has credit cooperatives which give its members loans at nominal interest.

It is significant to note that from the economic as well as social points of view, the Bhilai plant has become a nucleus providing powerful stimulus to the development of the productive forces of entire Madhya Pradesh and raising the living standard of the people.

The construction of the Soviet-Indian project in Hardwar—Bharat Heavy Electricals—and the township there has changed the face of the town shrouded in ancient legends and which still remains one of the holiest places on the river Ganga.

Similar examples can be found at other projects of Soviet-Indian cooperation also, for instance, at the antibiotics plant in Rishikesh, aluminium plant at Korba, oil refineries at Barauni and Koyali, instruments plant at Kota, machine-building plants at Ranchi and Durgapur, electric stations, etc.

The construction and operation of Soviet-Indian cooperation projects formed a base for creating around them a large number of enterprises of the small sector, engaged in the manufacture of a large variety of auxiliary products, different types of raw materials and the processing of wastes and semi-products.

The small-scale industrial enterprises provide employment to a large number of people, turn out about 40 per cent of the industrial output and consist of about 90 per cent of the registered enterprises in the country. They account for the export of various kinds of products worth about 200 crore rupees. That is why it is difficult to overestimate the role and significance of the enterprises of the small-

scale sector in the further development of India's economy, for solving the unemployment problem.

It is a recognised fact that Soviet-Indian cooperation serves as a tremendous stimulus for the development of the small sector.

According to a report in the Indian newspaper *Economic Times*, (May 10, 1978) there are at present 112 small sector enterprises around the Bokaro Steel Plant. The cost of their products has increased from 1.5 crore rupees in 1972 to 6.15 crore rupees at present. The orders of Bokaro plant for these enterprises during this period have risen from 0.6 crore rupees to 3.1 crores. These enterprises not only sell their products to the plant, but avail the free services of the plant's laboratories and quality control facilities. These small-scale units are given, within two weeks, up to 90 per cent of the value of their products sold to the plant.

On the whole, according to the estimates of Indian economists, by May 1977 the ten main projects of Soviet-Indian cooperation had given rise to more than 800 small-scale enterprises with 120 at the Bhilai, 85 at Ranchi Heavy Machine-Building Plant, 76 at the Durgapur Mining equipment Plant and 80 at the Kota instruments plant. The pharmaceuticals plant in Hyderabad, which is the largest producer of basic drugs in the country, supplies huge quantities of its products to the small-scale enterprises for packaging and other work. Besides, many state and private sector enterprises execute orders for the construction of Soviet-Indian cooperation projects, providing employment to tens of thousands of Indians.

It is abundantly clear that it is not enough to build large modern enterprises ; it is necessary to train specialists who can control the complex machines and units.

Noting the importance of training national cadres for India, Jawaharlal Nehru said in March 1959 : "To build a plant is comparatively easier, it is far difficult to train people to run this plant or build other plants.

The importance of this problem also stems from the fact that with the development of technical progress in the world and in India itself, here arises a sharp demand for qualified cadres for ensuring more efficient utilisation of productive capacities of the existing enterprises, more active development of scientific-research work inside the country and for designing of enterprises with local resources.

The training of qualified Indian cadres has become one of the main directions of Soviet-Indian cooperation. All agreements on

economic, technical and scientific cooperation between the USSR and India envisage broad participation by the Soviet Union in the training of Indian technical cadre.

Soviet-Indian cooperation promoted the creation of national technical cadre. Besides, thousands of workers and technicians received necessary knowledge and qualification with the help of Soviet specialists. Since 1955, more than 50,000 Indians were trained during the construction, assembly and initial commissioning, directly at the projects. Each year several thousand people are trained at educational centres set up at cooperation projects. A large number of highly-qualified specialists are prepared at educational establishments set up with Soviet assistance.

The first step in this direction was the free assistance in setting up the IIT, Bombay, which enrolled the first batch of students in 1958. At present the Institute trains more than 2,500 students and post-graduates with an annual turnover of 300 specialists in eight specialities.

The Inter-Governmental Soviet-Indian Agreement of December 10, 1966 envisaged further development of cooperation in this field : assistance in the organisation of autonomous faculties in the existing higher educational establishments in specialities especially needed for India's economy. In accordance with this Agreement a faculty of metallurgy was set up at the IIT, Kanpur; other examples are, a faculty of geophysics at the Usmania University, a faculty of aircraft-designing at the IIT, Bombay, and a faculty of automation and electronic technology at the Institute of Sciences, Bangalore.

An important role in preparing the middle link in the control of production—technicians—is played by technical secondary schools set up with Soviet assistance in such branches as metallurgy in Bhilai, machine-building in Ranchi, oil and gas industry in Baroda, and electronics and energetics at Hyderabad. In majority of these educational institutions training is conducted on curriculums and programmes compiled with the help of Soviet professors and teachers.

Over the entire period of cooperation, more than 30 thousand specialists were prepared at all the higher and secondary educational establishments set up in India with Soviet assistance.

Besides, over the period of cooperation, about 3,500 Indian specialists underwent training or probationary period at Soviet educational establishments and at enterprises. Hundreds of Indian students have taken or are taking training at higher educational

establishments of the USSR. Many Indian scholars completed post-graduation and defended their degree or diploma in the USSR.

As a result of this systematic training of Indian specialists both in India and the USSR, it has become possible to introduce a progressive reduction in the number of Soviet specialists working in the Soviet-assisted projects in India at present. Many projects, such as electric stations, oil works and oil refineries, pharmaceutical enterprises and others, are fully managed by Indian specialists, a remarkable outcome of Soviet-Indian cooperation.

## MAIN BRANCHES AND PROJECTS OF SOVIET-INDIAN ECONOMIC COOPERATION

In about 23 years of fruitful cooperation, more than 70 industrial enterprises, agricultural farms, educational establishments, etc., have been built in India with Soviet assistance, of which about 50 have been either fully or partially commissioned.

The leading place in Soviet-Indian economic cooperation belongs to such projects as the steel plants in Bhilai and Bokaro, Heavy Machine-Building Plant at Ranchi, Heavy Electrical Equipment Plant at Hardwar, Mining and Allied Machinery Plant in Durgapur, Korba Aluminium Plant, Oil Refineries in Koyali, Barauni and Mathura, pharmaceutical plants at Hyderabad and Rishikesh, coal enterprises at Banki, Manikpur and Surkhachar, oil works, electrical stations and agricultural farms, etc.

These are modern, highly-productive enterprises which make a considerable contribution to the economic development of India. Thus, for instance, the cooperation projects account for more than 30 per cent of the total steel production in the country, extract 16 per cent of iron ore, extract 70 per cent and process 30 per cent of oil, produce about 15 per cent of electricity, a considerable part of metallurgical, power generation, mining and other kind of heavy machinery, turn out a large quantity of instruments, pharmaceutical products, etc. At present almost all these projects are working profitably: the net profit of only 5 of these projects in the 1976/77 fiscal year (Bhilai, ONGC, Ranchi Heavy Machine-Building Plant, Durgapur Mining Equipment Plant and Bharat Heavy Electricals in Hardwar) was to the tune of 110 crore rupees. Many of the Soviet-Indian cooperation projects are the largest not only in India, but in South-East Asia, as a whole.

## Ferrous Metallurgy

### *Bhilai Steel Plant*

Ferrous metallurgy is the branch in which Soviet-Indian economic cooperation started first and in which it especially attained huge dimensions. To the credit of Soviet assistance to India is the construction of the country's largest steel plant in Bhilai with a capacity of 2.5 million tonnes of steel a year, completion of the construction on the first phase of the Bokaro Steel Plant (1.7 million tonnes of steel a year). With Soviet assistance work is carried out on the expansion of the above-mentioned plants up to a capacity of 4 million tonnes of steel a year each. The largest design-consultancy organisation in the country in the field of metallurgy—MECON—has been set up.

Despite the fact that India had all the necessary natural resources (the country has large deposits of iron and manganese ores, coal, minerals for the production of flux materials and fire-resistant substances, etc.) the Indian metallurgical industry did not receive the necessary development till independence. It was ascribed, first of all, to the presence of competition by more developed Western countries, mainly Britain, the lack of desire on the part of the colonial powers to develop this branch in India and the absence of the source of machinery and know-how. In the first 3-4 years after independence the metallurgical industry did achieve some modest results : production of steel in 1950-51 reached 1.5 million tonnes. By this time the first Five-Year Plan was ready. And though the main attention was paid in it to the development of agriculture and irrigation, the plan envisaged allocations of 30 crore rupees for the construction of a new steel plant in the public sector. The new plant in accordance with the assessment of the demand was to produce about 800 thousand tonnes of pig iron and 350 thousand tonnes of steel.

However, during the first years of the fulfilment of the plan, it became clear that, first, the demand for steel would grow in the country at far higher rates than anticipated and, secondly, Western countries put up unacceptable conditions for rendering assistance in the construction of the plant in the public sector. Thus, the FRG firm Demag and Krupp offered a credit for the construction of the plant at 12 per cent annual interest, and also demanded shares in the joint stock of the Rourkela Steel Plant.

It was then that the Government of India approached the Soviet Union, which gave its consent to render technical and economic assistance in the construction of a metallurgical plant with a capacity of one million tonnes of steel annually and an agreement was signed in this connection on February 2, 1955.

The signing of this agreement compelled the FRG and Britain to offer credits for the construction of steel plants in Rourkela and Durgapur on more favourable terms. Thus, India's Second Five-Year Plan was launched simultaneously with the construction of the three steel plants with 1 million tonnes capacity each.

In May 1957, at Bhilai, the foundation stone was laid for the first blast furnace and in February 1959 the first smelting was achieved. In October 1960 India's Prime Minister Jawaharlal Nehru commissioned the first mill at Bhilai which was then the largest in Asia, and in February 1961 all the main shops of the plant were commissioned.

The construction of the plant and, later, its operation gave rise to most favourable comments both in India and abroad. The American economist John P. Lewis in his book *Quiet Crisis in India*, which dealt with the American policy in regard to the economic development in India, after visiting Bhilai, wrote : "What was arresting rather was the extraordinarily high morale of the Indian participants in the project. They were not only enormously proud of the relatively good record that the work at Bhilai had made, they were completely convinced that this was substantially their accomplishment." Referring to the organisational structure of the cooperation and joint work carried out by the Indian and Soviet specialists, he wrote : "Indians are assuming more and more the joint initiative as the work proceeded."

The Soviet assistance in the construction of the Bhilai plant was of a complex character :

Soviet organisations prepared the technical documentation, manufactured and supplied the necessary machinery and materials to the plant, helped in the construction of the plant, in the organisation and commissioning of the machinery as well as in attaining the designed capacities. The Soviet side did a great deal of work in preparing Indian metallurgists directly at the construction and the commissioning of the plant, as well as at the specially set up educational centre. A large number of Indian specialists were trained at enterprises in the USSR.



Some of the best technical cadres of the Soviet Union helped India in building Bhilai. One of the first leaders of a group of Soviet specialists at Bhilai was V.E. Dymshits, who is at present the Deputy Chairman of the USSR Council of Ministers. Another person who worked at Bhilai was N.V. Goldin, who is now the USSR Minister for the Construction of Heavy Industry Enterprises. These examples once again convincingly testify to the sincere and selfless character of Soviet assistance to India. And even today working at the Soviet-Indian cooperation projects are many veteran Soviet specialists, prominent business managers and highly qualified workers.

Further, with Soviet assistance the capacities of Bhilai were increased up to 2.5 million tonnes of steel per year. Of late the plant has reached a high level of mastering the capacities and has become the largest producer of steel in India. Annually the plant turns out a wide variety of products extremely necessary for the country, including marketable pig iron, billets, quality rolled steel and rails, etc. The share of Bhilai in overall steel production in the country is about 30 per cent. By March 1976 Bhilai had smelted 25 million tonnes of steel since the commissioning.

At present Bhilai is the most profitable metallurgical enterprise in India and has the lowest production cost of steel. This is ensured by advanced technology, reliable functioning of the machinery, and good professional competence of Indian engineers and workers.

Bhilai is the main exporter of Indian ferrous metals. The plant's products are well-known not only in many developing countries, but also in the USSR, Japan, the USA and other countries.

At present work is in full swing at the Bhilai plant, with Soviet assistance, for its further expansion up to the capacity of 4 million tonnes of steel a year. The work is to be completed in 1981. The programme includes the construction of a large converter shop with the continuous steel-smelting installation, a modern thick-sheet mill "3600" and a number of other large units.

The firstling of Soviet-Indian cooperation, the Bhilai Steel Plant is justifiably considered the symbol of friendship between our two peoples.

## *2. Bokaro Steel Plant*

The year 1978 is remarkable for Soviet-Indian cooperation: On February 26, the President of India, Neelam Sanjiva Reddy, at a

solemn ceremony, commissioned the third blast furnace at the Bokaro Steel Plant, which marked the completion of the construction of the first phase of the plant. Speaking at the ceremony, the President described Bokaro as a milestone in the history of Soviet-Indian economic cooperation.

The story of Bokaro is interesting. Originally it was planned to be built with the participation of the USA which, for a long time, delayed a final decision. At last, in 1963, the American Government conveyed to the Indian side concrete proposals which caused legitimate indignation in the country. Washington put the condition that during the first decade of the commissioning of the enterprise, the US companies should be the full masters. American officials gave the understanding that the USA did not intend to assist in the development of the public sector and in the strengthening of India's economic independence.

In this situation, remembering the good experience of cooperation in the construction of the Bhilai Steel Plant, the Indian Government approached the Soviet Union for help. On May 1, 1964 the Minister of Steel and Mines C. Subramaniam made a special announcement in the Lok Sabha : "With great satisfaction," he said, "I am reporting to the 4th Parliament and the country that the Government of the USSR has agreed to render assistance to India in the construction of the entire steel complex of Bokaro."

And the USSR, indeed, rendered all the necessary technical assistance to India : from designing and deliveries of equipment, to the deputation of Soviet specialists and the training of Indian experts in the USSR. Here India's own possibilities were taken into account to the maximum in the fulfilment of the design work, manufacture and deliveries of equipment and materials.

Today, Bokaro is the largest project in the entire history of India. More than 60 thousand workers and engineers worked on the construction of the first phase of the plant. Hundreds of thousands of workers in all parts of the country are fulfilling the orders for the construction and exploitation of the plant.

At present work is going on at the plant for its expansion up to a capacity of 4 million tonnes of steel per year, after the accomplishment of which, like Bhilai, it would become the largest metallurgical plant in the entire South-East Asia.

Bokaro is being equipped with the modern and highly-productive machinery tested in the experience of commissioning of metallur-

gical plants in the USSR. The dimensions of the plant can be judged from the fact that the length of only one hot-rolling mill is one and-a-half km and the speed of rolling sheets is comparable with that of a passenger train—about 65 to 70 km per hour.

With the commissioning of the first phase of the plant with a capacity of 1.7 million tonnes of steel per year India will get annually about 1.4 million tonnes of scarce rolled sheet steel. After the completion of the second phase India will be able to completely meet the country's requirement of cold-rolled, hot-rolled and galvanised sheets on whose import India has to spend considerable amounts in foreign exchange.

Depending upon the requirements of the internal market, part of Bokaro's products can be exported. In the 1976-77 fiscal year the export of the plant's products exceeded 30 crore rupees. At present the plant exports its products to 21 countries of the world, including the USA, Japan, Yugoslavia, Poland, Indonesia, the Philippines and Pakistan. One of the first buyers of the plant's products was the Soviet Union.

### **Non-Ferrous Metallurgy**

#### *Aluminium Plant at Korba*

The growing volume of industrial production in India promotes higher rates of growth of requirements in non-ferrous metals, especially in such fields as machine-building and electrical engineering. With comparatively lower rates of production of zinc, copper, lead, nickel, and to a lesser degree, of aluminium, India has to spend considerable sums on their import which, of late, constituted 120 to 140 crore rupees.

With this situation in view, India is making considerable efforts in the development of its own non-ferrous metallurgy. Of late, a number of large deposits of bauxite, copper, zinc, nickel and fluorites were discovered in the country, and a number of projects are under construction.

Most impressive successes have been achieved in the aluminium industry where the level of production makes it possible to almost completely satisfy the internal requirements for this metal.

In the solution of this task an important role is being played by the state-owned Bharat Aluminium Co. (BALCO), which is carrying

out construction with Soviet assistance on the largest aluminium plant with a capacity of 100 thousand tonnes of metal per year. The plant consists of such basic shops as the electrolysis, foundry, sheet-rolling, etc. At present three phases of electrolysis unit have been commissioned, with a capacity of 75 thousand tonnes per year. The completion of the construction of the electrolysis unit as well as of the rolling and foundry mills is slated for 1979.

Upon completion of the construction the plant will turn out a wide assortment of aluminium products.

Another direction of Soviet-Indian cooperation in the field of non-ferrous metallurgy is for the production of copper, whose scarcity is felt especially sharply in India.

In 1968 Indian geologists trained in the USSR discovered deposits of copper ore in the region of Malanjkhand (Madhya Pradesh). These deposits are evaluated at 82.8 million tonnes with fairly high content of copper which in certain places reaches 2 per cent or more. After visiting the deposits, Soviet experts decided to build in this region a large copper ore-enriching complex with a capacity of extracting and processing 3 million tonnes of ore per year.

In the beginning of 1976 Soviet organisations prepared and submitted to the Indian side the technical project of the pit and the ore-enriching complex.

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In the context of Soviet-Indian cooperation in the field of metallurgy, it is necessary to remember the MECON (Metallurgical Engineering Consultants Ltd.) established with Soviet assistance. This organisation at present has become a leading designing organisation in India in the field of ferrous and non-ferrous metallurgy. With a staff of about 2,500 engineers and technicians, MECON has branches in Bangalore, Calcutta, Bokaro, Bhilai, Durgapur, Rourkela and is carrying out independent designing of a number of large projects.

It is enough to remember that at present the MECON is working in the capacity of a general designer on the expansion of the Bhilai Steel Plant up to a capacity of 4 million tonnes of steel, on the construction of the second phase of the Bokaro Steel Plant, on the designing of the shops and auxiliary units of the Korba Aluminium Plant, on designing works at steel plants at Rourkela, Durgapur and on designing a number of iron-ore pits and other projects. The MECON is also rendering design-consultancy services to a number of

foreign countries, including Nigeria, Iraq and Romania. In the 1977-78 fiscal year the profit of the company was to the tune of 125 lakhs of rupees, including about 54 lakhs in foreign exchange.

The cooperation of Soviet organisations with the MECON is realised in the form of deputation of Soviet specialists, in training of Indian specialists at designing organisations of the USSR, in transferring to the MECON technical documentation, analogous drawings, etc., and in joint designing of a number of cooperation projects.

It is difficult to overestimate the significance of Soviet assistance in the establishment of the MECON, since its successful work, in reality, testifies to the fact that India is near to self-sufficiency in yet another vital branch—designing of metallurgical projects.

### **Oil Industry**

Soviet-Indian cooperation in the field of oil extraction and refining is of tremendous importance to India's economy.

The Oil and Natural Gas Commission set up by the Indian Government in 1956 with active Soviet assistance has now grown into a powerful organisation for exploration and extraction of oil and natural gas in the country. Since its inception, the ONGC has drilled more than 1,300 wells, discovered 38 oil and gas deposits and extracted about 55 million tonnes of oil and 6 billion cubic metres of gas. Over the period, the USSR delivered to India equipment and materials worth 1,200 crore rupees for geological survey and drilling, and sent more than 1,500 Soviet specialists. About 400 Indian engineers and workers underwent production training in the USSR. Besides, about 5,000 Indian specialists were trained directly at projects.

The fruitfulness of Soviet-Indian cooperation in oil industry became especially obvious recently, when the world was plagued by the oil crisis and world prices of oil shot up several times. Considerable quantities of oil produced by the ONGC saved India from huge expenditures on its import.

The first attempts to discover oil deposits in India were made way back in 1886, only 7 years after world's first oil well was drilled. However, oil was discovered accidentally for the first time 20 years later in Assam during the laying of a railway track. The discovered deposit was called Digboi and became the property of a British company.

However, the first success was not followed by necessary systematic efforts for further search for oil in the country. Moreover, the British colonial authorities tried to turn India into a reliable market for British oil obtained from the countries of the Middle East and the Persian Gulf, where by that time large deposits of the liquid fuel had been discovered. Attempts by individual Indian businessmen or companies to continue the search of native oil were practically suppressed.

As a result by the time of the attainment of independence, the country, in fact, had no oil industry of its own. As was noted by the National Planning Committee under the Indian National Congress in one of its resolutions in 1939: "The government did not undertake any serious attempts at organisation of oil exploration with the use of modern geophysical methods." At that time the Geological Survey of India had no oil expert on its staff and the country had no specialists, equipment or even necessary maps. All that the first Indian Government had at its disposal was a seismological station and several gravimeters.

Despite the lack of any proper base and the efforts of experts of international oil monopolies to convince in the futility of oil exploration in India, it was decided to take up the establishment of a national oil industry in the second Five-Year Plan.

Realising the futility of approaching Western countries for assistance in oil exploration the Indian Government in the autumn of 1955, immediately after the signing of the Agreement on cooperation in the construction of Bhilai Steel Plant, sent a delegation to the Soviet Union headed by the then Minister of Natural Resources, Mr. K.D. Malaviya, for studying the possibilities of cooperation in the field of exploration and extraction of oil and gas.

Meeting the desire of the Indian Government, the Soviet Union in December 1955 sent to India a group of Soviet geologists headed by a prominent expert, A.N. Kalinin. The group familiarised itself with all the available data, visited a number of sedimentary basins and after 5 months of strenuous work came to the conclusion that even the scanty information available makes it possible to hope to discover large oil deposits in a number of regions. The optimistic forecasts by Soviet geologists, which were in complete contradiction with the evaluation by Western experts finally solved the question in favour of the establishment of a national oil industry in India.

Soviet geologist Kalinin, estimating the oil reserves in India, wrote : "The area of sedimentary rocks prospective for oil and gas in India is spread over 1 million sq. km. If we fix tentatively the average quantity of hydrocarbonates at 10,000 tonnes for 1 sq. km (in the USSR and the USA the figure is 23,000 and 26,000 tonnes respectively, and the other countries it is equal, approximately, to 15,000), then we can estimate extractable oil reserves at 4 billion tonnes and about 2 trillion cu. m. of gas...Possibilities of additional reserves of oil and gas on the continental shelf should also be considered."

The report by Soviet geologists was, in fact, a historic turning point and laid the beginning of an all-round development of oil industry in India.

Soon, Soviet experts worked out a programme of exploration work, envisaging an allocation of 30 crore rupees during 1956-1961 and pin-pointed a number of regions for drilling work. The amount seems now modest compared to, say, the allocations of the ONGC in the current Five-Year Plan, which are to the tune of 1,800 crore rupees. Here, it should be recalled that in those times doubts existed as to the possibility of discovering oil in India and many Indians believed in the authority of Western experts who had predicted the futility of wasting money on the search of oil. These doubts, however, soon vanished. The first successes of drilling work at the deposits of Cambay (September 1958), Ankleshwar (May 1960), Rudrasagar (Assam, January 1961) and Kalol (June 1961) firmly put India among the oil-extracting states. And the investments in their discovery were quickly recovered : only one oil-field at Ankleshwar, giving about 3 million tonnes of oil per year, saves to the country more than 300 crore rupees in foreign exchange annually.

The Soviet Union also rendered assistance to India in the exploration of off-shore oil. In 1964-1966, as a result of researches carried out by the Soviet seismic vessel "Academician Arkhangelsky", a forecast was made about the presence of large reserves of oil on the west coast of India. And again these predictions by Soviet experts were brilliantly corroborated by the large sea-oil deposits discovered recently. At "Bombay High", as the deposits are called, oil extraction is going on.

Over the years of cooperation, the ONGC has turned into a leading oil-producing organisation in the country. In 1977 it extracted more than 7 million tonnes of oil which is about 70 per cent of the country's total oil output. The ONGC continues to expand the

geological exploration work practically on the entire territory of India. Especially impressive successes were scored by the ONGC in the exploration and extraction of oil on the continental shelf. Of late it has turned into one of the most profitable public sector enterprises, yielding a profit of 32 crore rupees in 1976-77.

The accumulated experience, good technical equipment, capability to independently carry out complex survey, geological exploration and drilling works gave the ONGC the opportunity to carry out these works abroad also, in Iran, Iraq and Tanzania.

The USSR's cooperation with India in oil industry is successfully continuing. Soviet and Indian experts have worked out a techno-economic report on the development of oil industry in India for 1973-1983, which is being successfully implemented. In 1976, a group of Soviet and Indian experts studied the predictable reserves of oil and gas on the Indian territory, and pin-pointed a number of prospective regions. An understanding has been reached on setting up in India an institute of drilling technology and an institute for developing oil deposits, etc.

### *Oil-Refining Industry*

Soviet assistance to India in establishing the national oil industry did not confine itself only to the exploration and extraction of oil, it also helped in setting up oil-refining facilities in the country. Two oil refineries were built in India with Soviet assistance in Barauni (UP) and Koyali (Gujarat), each with a refining capacity of 3 million tonnes of oil per year.

Before the construction of the oil refinery in 1963, Koyali was a little, sleepy village. The decision to build a refinery there was taken after the discovery by the ONGC of large oil deposits nearby in Ankleshwar and Kalol. At present, Koyali is a large industrial centre. On the basis of oil products of the refinery a state petrochemical complex has been built nearby which is the largest in the country.

Koyali was also the first oil refinery in India in the designing and construction of which the share of Indian organisation was about 65 per cent. Soviet organisations supplied only some complex equipments. At present the Koyali Refinery is processing crude over and above its projected capacity, at the level of 4 to 4.5 million tonnes, and this testifies to the considerable reserve capacities of the equipment



supplied by the USSR. Necessary work connected with the use of these reserves were carried out by Indian experts independently—a proof of their high professional level.

Speaking about Soviet-Indian cooperation in building oil refineries in Koyali and Barauni, former Minister of Petroleum and Chemicals Dr. Triguna Sen said: "...the Soviet experts working at these projects quickly assessed the aptitude and capabilities of Indian engineers and helped them mastering the technology and know-how in the shortest period."

The Barauni and Koyali oil refineries turn out a wide variety of oil products ranging from domestic gas, aviation fuel and kerosene oil to asphalt for road-making. The technological equipment installed at the plants makes it possible to regulate the structure of oil products depending upon their demand.

The reserves of technical equipment and the schemes of plants determine the possibility of their further expansion. In particular, further expansion of the capacity of Koyali Refinery up to 7.3 million tonnes is nearing completion, and it will refine part of the oil from Bombay High. For this purpose a pipeline has already been laid from the sea shore to the refinery.

Both the plants are functioning efficiently and ensure high profits: the profit from Koyali was 24 crore rupees in the 1976-77 fiscal year and from Barauni—26 crore rupees.

Soviet-Indian cooperation in oil-refining industry is successfully continuing. At present, with the assistance of Soviet organisations, India's largest oil refinery is under construction at Mathura with a capacity of 6 million tonnes of oil per year. The location of the plant was selected by the Indian side not accidentally. The central and north-western regions of India—UP, Punjab, Haryana and others—are experiencing a fast growth in the agricultural and industrial production which caused high rates of growth in demand for various oil products. It is uneconomical to meet these requirements by transporting oil products from the other refineries at Koyali, Bombay, Cochin, Madras, Vishakhapatnam, Barauni, Haldia, etc. Hence, the location of the new refinery had to be the nearest to the consumers of its product. Crude oil from the western coast of India will be brought to the refinery through the oil pipeline which is also a more economical sensible solution. The plant can also handle imported crude.

In the construction of the Mathura Refinery India's possibilities in the field of designing and manufacturing of equipment have

been taken into consideration to the maximum extent. Suffice it to say, that the share of Soviet organisations in the construction of the plant accounts for only 20 per cent.

Soviet-Indian cooperation in the field of oil industry is a brilliant example of its comprehensive character. It embraces a whole range of questions connected with the development of this important branch in the economy of any country, which includes prospecting and extraction of oil, its refining, implementation of search and design works, provision of necessary technology, know-how, equipment, materials, deputation of specialists and training of national cadre.

### **Power Engineering**

One of the main conditions of economic progress of a country is the fast development of its power engineering. In this context the experience of the Soviet Union is significant, since its industrialisation began with the development and implementation of a ten-year plan of the country's electrification.

As is known, India inherited from the colonial past only a few small power stations with an overall capacity of 1.7 million KW. The country was faced with the task of practically creating the power industry anew. In this connection Jawaharlal Nehru noted that "there are two criteria of progress of a nation : the development of metallurgical industry and power engineering".

The first large electric power project in India, built with Soviet assistance, was the 600 MW Neyveli Thermal Power Station (Tamilnadu). The construction work started in 1959 and it was completed in three stages of 250, 400 and 600 MW capacities. Units with a capacity of 50 and 100 MW were installed at the station. A distinguishing feature of the station is that low-grade local coal—lignite—is used as fuel. The low heating value and high degree of moisture of lignite. Posed before the Soviet and Indian designers and experts a number of technical problems which were successfully solved. And in August 1962 Neyveli gave the country its first current. At present the station at Neyveli is one of the largest in India and supplies electricity to a large industrial region. The Government of India has decided to further expand the station's capacity to 630 MW by installing 3 units of 210 MW each.

The positive experience of Soviet-Indian cooperation in the construction of the Neyveli station paved the way for the construction of a number of power stations in India. In 1961 and 1962 contracts were concluded on the construction of thermal power stations at Obra (UP) and at Korba (Madhya Pradesh). These stations at present are successfully operating. These were followed by other agreements.

Soviet-Indian cooperation in the construction of hydro-power stations also developed successfully. An example of this was the Soviet participation in the construction of the Bhakra-Nangal Hydro-power Station on the right bank of the river Sutlej. The idea of the construction of a power station at this place was born way back in 1908. However, it could be materialised only after India's independence, i.e., on November 17, 1955. Jawaharlal Nehru laid the foundation stone of the station's dam. Soon a 225-metre-high concrete gravitational dam rose in this place, housing two hydro-stations : the left-bank station with a capacity of 450 MW and the right-bank station built with Soviet assistance with a 600 MW capacity (five hydro units, 120 MW each). Describing his impressions of the visit to the station, Nehru wrote : "The Bhakra-Nangal project is something enormous, something amazing, something that impresses you when you see it. Bhakra is a new temple of the renaissance India."

The Bhakra-Nangal is the largest hydro-power project in India, a huge hydro-technical complex. It supplies electricity to 7,300 villages and 128 settlements and towns. The dam ensures irrigation of 6.5 million acres of land and on another 3.5 million acres irrigation possibilities were considerably improved due to the system of canals. The annual increase in the output of grain, cotton, sugarcane and other agricultural produce was worth more than 200 crore rupees due to the improvement in irrigation canals and electrification of pumping installations. In all, eleven power stations with an overall capacity of more than 3,000 MW have been built in India with Soviet assistance.

Besides, a number of large power stations has been built with Soviet help at the steel plants at Bhilai and Bokaro, at the Barauni and Koyali oil refineries, etc. The overall capacity of power stations built with Soviet assistance in India is 3200 MW or about 15 per cent of the entire power output in the country. All the power stations at present are being operated by Indian personnel independently and are functioning profitably.

*Power Stations built in India with Soviet Assistance*

<i>Name of power station</i>	<i>Number of units</i>	<i>Capacity (MW)</i>
1. Neyveli TPS	6× 50 MW 3× 100 MW	600
2. Bhakra HPS	5× 120 MW	600
3. Kobra TPS	4× 50 MW	200
4. Obra TPS	5× 50 MW	250
5. Lower-Sileru HPS	2× 115 MW	230
6. Mettur HPS	4× 56 MW	224
7. Patratu TPS	4× 50 MW 2× 100 MW	400
8. Harduaganj TPS	2× 50 MW	100
9. Hirakud HPS	1× 25 MW	25
10. Balimela HPS	6× 60 MW	360
11. Linganamaky HPS (under construction)	2× 26 MW	52
Total	46	3041

### Machine-building

The successes scored by India in the creation of a stable industrial base, particularly in the development of metallurgical, mining and oil industries as well as energetics and other key branches of national economy are, to a considerable extent, connected with the construction of large enterprises of machine-building industry and, mainly, the enterprises of heavy industry.

Jawaharlal Nehru in his book *Discovery of India* wrote that "the three fundamental requirements of India, if she is to develop industrially and otherwise, are a heavy-engineering and machine-making industry, scientific research institutes and electric power... We lacked all these... Even when World War II started, the necessary machinery was not allowed to be imported."

In 1956, the first group of Soviet experts arrived at the invitation of the Government of India to study the question of the development of heavy machine-building in India and for preparing con-

crete proposals. On the basis of the proposals submitted by this team, the Government of India decided to build with Soviet participation two large machine-building plants : the Heavy Machine-Building Plant at Ranchi and the Mining Equipment Plant at Durgapur. Later the government also decided to construct the Heavy Electrical Equipment Plant at Hardwar and the Instruments Plant at Kota with Soviet assistance.

Within a short period, large state owned machine-building enterprises were built in India. These were equipped with highly productive, modern machinery and formed the nucleus of this vital branch of economy.

The creation of these enterprises allowed India in a short period to score considerable progress in achieving economic independence. The above-mentioned plants with friendly help by the Soviet experts successfully mastered the production of a wide range of complex equipment and are playing a leading role in the manufacture of equipment for steel plants, power stations, coal mines, ports, etc.

#### *Ranchi Heavy Machine-Building Plant*

The Heavy Machine-Building Plant at Ranchi, which belongs to the Heavy Engineering Corporation of India, is designed for producing 80 thousand tonnes of various types of heavy machinery, intended for metallurgical, oil, cement and other branches of industry. The construction work began in 1961 and the plant was inaugurated in November 1963 by Jawaharlal Nehru.

In accordance with inter-governmental agreements the Soviet organisations carried out prospecting and design work, delivered about 45 thousand tonnes of modern technical equipment, materials and deputed experts for rendering assistance in the construction and operation of the plant. Nearly 250 Indian specialists received training in the USSR at similar plants.

In its dimensions and diversity of goods turned out by it, the Ranchi Heavy Machine-Building Plant can be compared with the largest enterprises of this kind in the world, such as the plants of Skoda in Czechoslovakia, Krupps in West Germany and Uralmash in the USSR. The plant can turn out annually enough machinery for equipping a metallurgical plant of one million tonne steel per year.

The Ranchi plant has supplied for the construction and expansion of the Bhilai and Bokaro plants about 120 thousand tonnes of

equipment at the end of the 1976-77 fiscal year, which made it possible for India to considerably reduce its import of component. In all, during its operational period the plant manufactured about 400,000 tonnes of goods worth 350 crore rupees.

Soviet-Indian cooperation in the Ranchi plant is continuing by way of Soviet deliveries of complex articles and units for the most complex equipment, transfer of technical documentation and deputation of specialists, etc.

However, in this cooperation new trends have appeared—trends of production cooperation. In 1976 a number of Soviet organisations placed orders with the Ranchi plant for equipment intended for Soviet-aided projects in third countries. These orders were placed in accordance with the decision of the third session of the Inter-Governmental Soviet-Indian Commission on Economic and Scientific-Technical Cooperation. They include manufacture of electrolyzers for an alumina plant in Yugoslavia, bridge reloaders for a nickel plant in Cuba, coking equipment and machines for metallurgical plants in Bulgaria, Egypt and Turkey, equipment for continuous casting of billets for a metallurgical plant in Turkey, crane equipment for Hungary and about 19 thousand tonnes of various machinery worth about 30 crore rupees. At present the Ranchi Heavy Machine-Building Plant has started fulfilling these orders.

This form of cooperation is a new phenomenon in the practice of Soviet-Indian relations and we are proud that its beginning was laid at one of the cooperation projects. Its realisation testifies, first of all, to the increased possibilities of the Indian machine-building industry. This has a number of irrefutable advantages for the Indian side. It means, first of all, an increase in the export of Indian engineering goods, which fully accords with the policy of the government in this field, earning of good reputation in the world market and an increase in the production capacities of the plant. It is planned to increase in the future the volume and variety of Indian engineering goods to be supplied to Soviet-aided projects in third countries.

#### *Mining Equipment Plant at Durgapur*

The Mining Equipment Plant at Durgapur under the state-owned Mining and Allied Machinery Corporation, has the capacity to produce 45,000 tonnes of equipment per year. Built with Soviet assistance, it was inaugurated by Jawaharlal Nehru in November

1963. A government press release on the occasion said : "Absence of a necessary machine-building plant in the country for manufacturing coal-mining equipment was the main obstacle for our mining engineers who, until now, had to rely on foreign equipment and use methods of mining coal not always ideal for the prevailing conditions. For solving this delayed problem the Government decided to build a mining equipment plant at Durgapur."

The plant's output includes equipment necessary for mining operations, particularly for coal-mining, loading, underground transport, lifting, ventilation, water-pumping, etc. The equipment will be mainly based on the best Soviet models, but it will also be modified to the maximum possible extent to suit Indian conditions.

At present the Durgapur plant is the main manufacturer of mining equipment in India, including coal combines, cutting machines, hydraulic columns, different kinds of conveyers, ventilators, pumps, etc.

Besides supplying equipment for projects of coal and mining industry, the Durgapur plant also manufactures equipment for steel plants at Bhilai and Bokaro, loading and unloading equipment for ports, etc.

As in the case of the Heavy Machine-Building Plant at Ranchi, the Soviet organisations have placed orders with the Durgapur Mining Equipment Plant to equip Soviet-aided projects in third countries.

### *Heavy Electrical Equipment Plant, Hardwar*

Only ten years ago India had to fully depend on import to equip its thermal and hydro-power stations. But today it attained full self-sufficiency in the production of power-engineering equipment. The Heavy Electrical Equipment Plant, built with Soviet assistance in Hardwar in 1970, is playing a great role in this regard. The plant belonging to the state-owned Bharat Heavy Electricals is the largest enterprise of its kind not only in India, but in the entire South-East Asia. Even the Soviet Union does not have a similar plant, which would produce under one roof hydraulic and thermal turbines and generators for them, electric motors of medium and large capacity, and various electro-technical apparatuses and other types of equipment. The Hardwar plant accounts for more than 57 per cent of the over-all capacity of the country for manufacturing turbo and hydro

outfits. The projected capacities of the Heavy Electrical Equipment Plant comprise :

- production of steam turbines and generators — 1500 MW/year
- production of hydraulic turbines and generators — 1200 MW/year
- production of electrical machinery — 515 MW/year

The Soviet Union prepared the necessary technical documentation for the construction of the plant, delivered modern equipment and deputed experienced experts. Besides, the Soviet organisations regularly supply assembly sets, materials and spare parts. All this helped the plant to quickly master the production capacities for turning out the most complex power-engineering equipment and to operate profitably.

The plant was the first in India to master the production of turbo-generators with a capacity of 200 MW, which are at present being assembled at various power stations of the country. Soviet experts provide broad help to the plant in assembling, adjustment and commissioning these units. In August 1978 the first 210 MW turbo-unit built for the first time in India was commissioned at the Obra Thermal Power Station.

### **Coal Industry**

India possesses huge deposits of coal which occupies one of the main places in the fuel energy balance of India. In the conditions of the growing oil crisis in the world the significance of coal as a source of energy is constantly increasing.

The Soviet Union is rendering considerable assistance in the development coal industry in India. A number of modern coal industry enterprises have been built in India with Soviet assistance, including the Banki coal-mines with a capacity of 0.6 million tonnes of coal per year, the Surkhachar coal mines (1.1 million tonnes), the Manikpur coal quarry (1 million tonnes) and the Kathara coal washery for processing 3.0 million tonnes of raw coal per year. For carrying out medium repairs and general overhauling of mining equipment a central electro-mechanical workshop has been set up at Korba with a capacity of 7.5 thousand tonnes of equipment per year.



During the visit to India in November 1973 of the General Secretary of the CPSU Central Committee, L.I. Brezhnev, the question of further cooperation in coal-mining was also discussed. In December 1973 a group of Soviet experts, headed by the USSR Minister of Coal Industry, Bratchenko, visited India to examine concrete questions of cooperation. As a result of an Agreement, from April to October 1974, a group of Soviet specialist-designers stayed in India, who jointly with Indian specialists from the Institute of Coal Industry in Ranchi, prepared the feasibility report for the complex development of Singrauli and Raniganj coal deposits. The report, in particular, confirmed the possibility of constructing several quarries for mining about 80 million tonnes of coal per year from the Singrauli deposits. The location was selected for constructing with possible Soviet assistance two pits, Jayant and Dudichua, and a central mechanical repairs workshop with a capacity of 21 thousand tonnes of equipment per year.

Soviet and Indian experts prepared the techno-economic report for constructing two mines, the Jhanjhra-I and the Jhanjhra-II, with an overall capacity of 5.3 million tonnes of coal per year, at the Raniganj deposits. The Jhanjhra-I mine is proposed to be built with the participation of Soviet organisations. The technical documentation for these projects are being worked out jointly.

In accordance with the earlier concluded Agreement, work is in progress on designing a coking coal pit at Ramgarh with a capacity of 3 million tonnes per year, for which Soviet organisations have prepared and handed over the technical project to the Indian side for study.

Besides, Soviet and Indian specialists are jointly conducting experimental work at Nakrakonda and Chinakuri mines for caving in the roof with long face in the conditions close to those of the future mine Jhanjhra-I.

The joint work by Soviet and Indian experts on the above-mentioned projects has laid a good foundation for future development of coal industry in India.

### **Pharmaceutical Industry**

Over the period of independence India achieved considerable successes in the field of pharmaceutical industry and health care, which led to an increase in the average life-span of the population and reduction in the mortality rate. At present the pharmaceutical

industry in India has achieved such a level that puts it among the developed West.

A notable part in this process was played by cooperation with the Soviet Union, with the help of which three large public sector enterprises were built in India: the Synthetic Drugs Plant at Hyderabad, the Antibiotics Plant at Rishikesh and the Surgical Instruments Plant in Madras. All these plants are under the state corporation, the Indian Drugs and Pharmaceuticals Ltd.

Before independence India met its demands for allopathic drugs mainly through imports. These drugs were highly priced and were beyond the reach of the masses. The government of independent India decided to change the situation. To provide its citizens with drugs at reasonable price was not an easy task. And it was possible to solve it only through the establishment of national pharmaceutical industry for which the country needed economic and technical help.

Way back in 1948, the Government of India sent its specialists to a number of Western countries with the aim of getting help in solving this problem. Western firms either did not evince any serious interest in rendering assistance to India or put up unacceptable conditions.

In 1950 India succeeded in getting help from the World Health Organisation (WHO) and UNICEF in setting up a small plant for manufacturing penicillin. As a result, the first antibiotics plant was built in the public sector at Pimpri near Pune. But its capacity was not sufficient for meeting the requirements of the country.

In 1953 a group of Indian specialists and scientists visited the Soviet Union. They are greatly impressed by the fact that Soviet scientists did not regard their achievements as professional secrets and were ready to share them with others. Unofficial contacts among scientists led to official contacts. In 1955 after the signing of the agreement on cooperation in the construction of the Bhilai Steel Plant, the Government of India invited a group of Soviet specialists for working out a plan for setting up a pharmaceutical industry in the public sector.

Soviet specialists after visiting India in 1956 prepared their recommendations which included the expansion of the plant at Pimpri and construction of a number of new enterprises for producing other antibiotics, synthetic drugs, vitamins, etc.

Western drug firms, afraid of the possibility of losing the huge Indian market, changed their tactics and agreed to cooperate with

private Indian firms in setting up pharmaceutical production in the country under Indian permits. However, this did not solve the problem since the Western firms, as usual, did not want to produce basic drugs in India. They concluded agreements with Indian firms mainly for manufacturing in India formulations based on their own base drugs.

Two years later, in 1958, Soviet experts were again invited to India for preparing a new plan for the development of pharmaceutical industry in the country. In accordance with the plan submitted by this team it was decided to build a plant for producing various types of antibiotics, a plant for producing synthetic drugs, vitamins and chemical semi-products, a plant for herbal medicinal preparations and a plant for producing surgical instruments. The Soviet Union offered to render assistance in the construction of these enterprises not only by working out design documentation, deliveries of equipment, preparation of cadre, but also by transferring the necessary technical know-how. Unlike the western companies, the USSR did not demand in exchange the payment of royalties or share in the profits. For the construction of these enterprises, the Soviet Union granted to India a handsome credit under a separate inter-governmental Agreement of May 29, 1959.

Soon a decision was taken to build an antibiotics plant in Rishikesh, a plant of pharmaceutical preparations in Hyderabad and a plant of surgical instruments in Madras. The fourth plant for manufacturing herbal medicines in Kerala was dropped for economic reasons.

#### *Plant of Pharmaceutical Preparations, Hyderabad*

This plant with the annual designed capacity of 850 tonnes of drugs was commissioned in 1968 and is the largest not only in India but in the entire South-East Asia. At present the plant turns out more than 30 basic drugs in seven groups (analgesic, antipyretic soporific and vitamins, etc.) and is successfully mastering the production of new drugs. The plant's capacity now has been raised up to 2000 tonnes of drugs per year.

#### *Antibiotics Plant at Rishikesh*

The plant with a designed capacity of 290 tonnes of antibiotics was commissioned in 1967, and is producing all the eight basic antibiotics, including penicillin, streptomycin, and tetracycline. The basic drugs obtained from the plant are used for making capsules, tablets,

ointments, powders and solutions and other preparations. Work is on at the plant to improve technology, increase the output of drugs and master new forms of production. As a result the production of penicillin, oxitetracycline and tetracycline has considerably increased compared to the designed capacity of the plant. It is planned to further increase the production and to master the production of semi-synthetic antibiotics.

*Surgical Instruments Plant, Madras*

The plant has a capacity of producing 2.5 million pieces of surgical instruments enough to satisfy indigenous requirements.

Soviet-Indian cooperation in one of the most humanitarian fields of man's activity—pharmaceutical industry—has achieved good results which help India satisfy, to a considerable extent, the demand for many types of drugs.

## PROSPECTS OF COOPERATION

In accordance with the Agreement of September 19, 1972 between the Governments of the USSR and India on setting up the Inter-Governmental Soviet-Indian Commission on Economic and Scientific-Technical Cooperation, the fourth session of the Commission was held in New Delhi from March 2 to 6 of 1978. The Soviet delegation was led by the Chairman of the Soviet part of the Commission, Deputy Prime Minister of the USSR I.V. Arkhipov, while the Indian delegation was led by the Chairman of the Indian part of the Commission, India's External Affairs Minister Mr. A.B. Vajpayee.

In its work the Commission was guided by the spirit of the Joint Soviet-Indian Declaration signed at the end of India's Prime Minister Morarji Desai's visit to the USSR in October 1977, which expressed a firm determination of the sides to continue developing and strengthening all-round cooperation.

During the talks which took place in an atmosphere of friendship and mutual understanding, it was noted that the mutually-profitable cooperation between the USSR and India in the fields of economy, trade, science and technology is successfully developing and acquiring a more stable and multi-sided character. It was also noted with satisfaction that the decisions of the preceding third session of the Commission were being successfully implemented.

The fourth session of the Commission was preceded by the work of the joint groups of experts of the sides, set up in the main branches of cooperation : ferrous and non-ferrous metallurgy, machine-building, oil and coal industry, irrigation, production cooperation, as well as in the field of trade, science and technology. The experts examined all the present and perspective questions of cooperation in these fields and signed corresponding protocols which were considered in the preparation of the Commission's decisions.

Besides examining the current questions of cooperation and the implementation of obligations of the sides connected with the pro-

jects which are already operating, at designing stage or under construction, the fourth session paid considerable attention to the prospects of cooperation and search of new areas and forms.

First of all, the sides agreed on working out in 1978 a long-term programme of mutually-beneficial economic cooperation for developing key branches of Indian economy and mutual trade exchanges as envisaged in the Soviet-Indian Declaration of October 26, 1977 signed as a result of India's Prime Minister Mr. Morarji Desai's visit to the USSR. It was agreed that such a programme will cover a period of 10-15 years and can be expanded and supplemented in future depending upon the needs of the two countries.

With the aim of preparing the above-mentioned programme, a working group of experts of the sides was set up within the framework of the Commission, which held its first session in Moscow from July 10 to 17 this year. Heading the work of this group from the Soviet side is Deputy Chairman of the USSR State Committee of Planning N.N.Inozemtsev and from the Indian side—Member of the Indian Planning Commission, Mr. V.G. Rajadhyaksha.

The group has examined and approved the draft of the long-term programme. It was confirmed that, in accordance with the decisions of the fourth session of the Commission, considerable attention will be paid in the programme to questions of further expansion of cooperation in the construction in India of industrial and other projects, including the cooperation on compensation basis ; to the cooperation in further improvement of the operations of industrial and other projects built in India with Soviet assistance through the induction of new and improved technology, to the establishment or expansion of scientific research and design consultancy units, etc.; to the development of new forms of economic cooperation, including production cooperation and specialisation ; to the cooperation in designing and construction of industrial and other projects in third countries ; to raising the volumes of trade by way of expansion of items and volume of goods deliveries, search for new forms of trade etc.: to the expansion of scientific research cooperation as well as cooperation in planning, keeping in view the assistance in strengthening trade-economic and scientific-technical ties between the USSR and India. It was agreed that all these questions will be classified in seven sections of the long-term programme.

During the work of the group, the sides agreed also to hold meetings of experts of the sides in the fields of agriculture, animal husbandry, inland fishing, cellulose paper, pharmaceutical, food,

building materials and light industry, with the aim of examining the possibilities of cooperation in these branches and preparing proposals to be included in the draft of the long-term programme. In accordance with these decisions, in August 1978 a group of Soviet specialists arrived in India, who acquainted themselves with the present state and prospects of the development of above-mentioned branches of economy in India, and, keeping in view the achievements and possibilities of the Soviet Union, prepared jointly with Indian organisations proposals for streamlining the cooperation.

It is necessary to note that many of these groups, from cellulose paper, food and light industries, as well as the industrial building-materials industry, came to India for the first time and studied questions of effective cooperation in these fields. The results of their work confirmed the presence of possibilities in organising such cooperation. At present the Soviet and Indian organisations are preparing for the realisation of the achieved agreements.

In the work of all the groups considerable attention was paid to the questions of smooth cooperation in the field of scientific-research and joint participation in the construction of projects in third countries.

For the generalisation of the results of the work by the groups of experts and for final agreement on the text of the long-term programme, it is planned to hold the second session of the working group for preparing the programme.

During the fourth session of the Commission the sides examined the questions connected with one of the main directions of Soviet-Indian cooperation—ferrous metallurgy. The Soviet and Indian specialists noted with satisfaction the completion of the construction on Bokaro Steel Plant for a capacity of 1.7 million tonnes of steel per year and the successful course of work for raising it to 4 million tonnes. They also noted the successful implementation of cooperation of Soviet and Indian organisations in the expansion of the Bhilai Steel Plant also up to a capacity of 4 million tonnes of steel per year.

A number of other prospective questions and cooperation projects in the field of ferrous metallurgy were also discussed. An important agreement was reached on cooperation in the construction of a blast-furnace complex with a capacity of 1 million tonnes of foundry iron per year in the region of a port. Later, while examining this question, the Indian side decided in favour of a steel plant

instead of a blast furnace at Vishakhapatnam with a full cycle capacity of 3 million tonnes of steel per year with the first phase earmarked for 1 million tonnes. Soviet organisations consented for rendering assistance in the construction of this project. Thus an important decision was taken for building in India a third steel plant with Soviet assistance. At present Soviet and Indian organisations have started examining concrete questions of cooperation in this project.

In the field of ferrous metallurgy, the Commission examined perspective and interesting trends of cooperation, namely, participation of Soviet organisations in improving the existing and introducing new technology at the Bokaro and Bhilai steel plants.

In the case of Bhilai, an agreement has been reached on preparing the basic techno-economic considerations for the modernisation of the plant and accordingly the plant's capacity will be raised to 5 million tonnes of steel per year. This work is being carried out at present by a number of Soviet design and research organisations. Soviet organisations prepared and conveyed to the Indian side for consideration recommendations for raising the production of steel at the Bokaro plant up to 5.5 million tonnes per year and more on the projected capacities. Modernisation of the Bokaro and Bhilai steel plants will make it possible to considerably increase their production with the minimum capital investments. Moreover, the Soviet side has consented that the aforesaid technological improvement could be used by Indian organisations at other steel plants in India also.

There is an important trend in the cooperation in the field of scientific-research work in ferrous metallurgy. Soviet organisations have prepared a draft of the perspective, thematic plan of scientific-research work for the Steel Authority of India Ltd., connected with the modernisation of Bhilai Steel Plant.

An agreement was concluded in January 1978 for rendering technical assistance to MECON in utilising new achievements in designing in the field of ferrous metallurgy. Accordingly work is going on for transferring to MECON technical documentation on new technological processes and equipment, particularly, on the installation of dry extinguishing of coke, slag granulation inside blast furnace, etc.

In accordance with the decisions of the fourth session of the Commission the Soviet and Indian organisations examined questions of cooperation in the construction of a ferro-vanadium plant, in



designing and gravelling pits, in extracting and enriching iron ore, especially, the ore with low iron content, etc.

Taking into consideration the importance of further development of Soviet-Indian cooperation in the field of ferrous metallurgy, the fourth session adopted a decision about setting up a working group for ferrous metallurgy. In September-October 1978 a meeting of this group was held in Moscow, where all the questions of cooperation in the field of ferrous metallurgy were discussed and recommendations made for their solution. At the meeting of the working group texts were also agreed to be included in the long-term cooperation programme.

A working group in the field on non-ferrous metallurgy has also been formed. A meeting of this group, which was also held in Moscow in October this year, discussed the course of implementation of the decisions of the fourth session of the Commission on cooperation in the field of non-ferrous metallurgy and agreed on concrete steps for its further development.

One of the new projects of cooperation in this field is an alumina plant with a capacity of 600 tonnes of alumina per year. A distinguishing feature of this project, to be built in Andhra Pradesh, is that the expenses of Soviet organisations on its construction will be met by the Indian side through deliveries of up to 300 thousand tonnes of alumina per year to the Soviet Union. This plant, therefore, will be the first Indo-Soviet project to be built on compensation basis.

As is known, recently one of the biggest bauxite deposits in the world was discovered on the eastern coast of India, in Andhra Pradesh and Orissa. In October of 1977, a group of Soviet specialists visited these deposits, acquainted itself with the state of the prospecting work, local conditions, infrastructure and pre-designing considerations about the possibility of the construction in this region of large alumina plants to be executed by the Indian design organisation, the MECON, and carried out preparatory work for examining this question at the session of the Joint Commission. In the course of the fourth session two contracts were signed on this question : on deputation of Soviet specialists for carrying out, jointly with the Indian side, expert analysis of the deposits and the quality of bauxite in the selected areas in Andhra Pradesh and on working out the feasibility report on the construction of the plant. From June to August 1978 the Soviet specialists, on deputation in India, carried

out studies which confirmed the findings of Indian geologists on the deposits and the quality of bauxite, and provided initial data necessary for working out the feasibility report, work on which is now being carried out by Soviet scientific-research and design organisations.

In August 1978, the programme of scientific-technical cooperation in the production of alumina and aluminium, whose realisation would make it possible to set up in India, with Soviet assistance, a large scientific-research centre in this field, was finalised with the state-owned, Bharat Aluminium Corporation, under whose jurisdiction the plant will operate.

The fourth session of the Commission and the working group on non-ferrous metallurgy, also discussed such new and perspective trends of cooperation in this field, as the construction of a plant for producing nickel-cobalt on the basis of the limonite ore deposits at Sukinda (Andhra Pradesh), development of effective methods for enriching poly-metal sulphide ores with the purpose of obtaining concentrates, suitable for processing at operating steel plants in India, development of technology for extracting cobalt and nickel from the slag of the copper-smelting plant Ghatshila, extraction of rare and precious metals from the wastes of the enterprises of non-ferrous metallurgy in India and other questions. The Soviet and Indian organisations are actively working on the realisation of the above-mentioned agreements. On some of the aforesaid productions, the Soviet organisations have already carried out test trials of the ores, prepared or are preparing recommendations for technological processes, and are carrying work on preparing techno-economic feasibility reports, etc.

The working group on non-ferrous metallurgy at its session in Moscow also agreed on the texts to be included in the long-term programme of economic, trade and scientific-technical cooperation.

One of the most important directions of Soviet-Indian cooperation, on which considerable attention was paid at the fourth session of the Commission, is cooperation in the field of prospecting, extraction and processing of oil and gas. The Commission noted that Soviet and Indian specialists are successfully carrying out joint work on developing a programme of geological survey in West Bengal, on the project of complete development of Ankleshwar oil-field, on setting up an institute of drilling technology, etc. The sides also noted the successful course of cooperation in the cons-

truction of an oil refinery in Mathura the commissioning of which has been planned for the first half of 1980. In order to keep this time-limit, the Soviet organisations are planning to complete the deliveries of equipment for the plant 1978 itself.

Soviet and Indian oil experts have accepted the importance of working out a perspective technical-economic plan for all-round development of oil-extracting industry in India for 1981-1990. As mentioned earlier, the Soviet and Indian specialists had worked out in the beginning of the '70s a similar plan for a period of 1973-1983. This document, which is being successfully implemented, is in reality a strategic plan in accordance with which the national oil industry is being developed. At present, in view of the discovery of a number of new oil deposits in India and the availability of enough new geological data, the necessity has arisen for preparing a new plan on which a decision was taken at the fourth session. In the near future the Soviet and Indian specialists will start working on it.

The fourth session also discussed the question of using in the oil and gas prospecting in India the magnito tellurium method which gives extremely good results in certain geological conditions. In accordance with this decision, a group of Soviet experts has already visited India and prepared recommendations for its introduction. Now these recommendations are being examined by corresponding Indian organisations.

The question of participation of Soviet oil experts in conducting drilling work in Tripura was also examined. This region is considered highly promising in oil and gas. However, geological conditions here are characterised by special complexity which make the drilling work difficult. This question, at present, is also at the stage of realisation by Soviet and Indian organisations.

During the fourth session the sides discussed the course of realisation of cooperation at the machine-building plants in Ranchi, Hardwar and Durgapur and agreed to continue it through the deliveries from the USSR of assembly units, materials and spare parts, deputation of Soviet experts and training of Indian engineers and technicians in production technology in the USSR. Therefore it was decided to prepare in 1978 a mutually agreed working programme for its realisation,

The new trend of cooperation in the field of machine-building discussed at the session of the Commission is the improvement of

existing and introduction of new technology at these plants. It was also decided that the experts of the sides would work out a concrete programme for this cooperation.

A further step in the development of cooperation in the field of machine-building was the approval by the Commission of the decision about setting up a specialised institute for designing metallurgical equipment at Ranchi with the assistance of the Soviet All-Union Scientific-Research Institute of Metallurgical Machine-Building. The establishment of such an institute will be yet another step by India in achieving self-sufficiency in the field of scientific-research and design-work for the development of machine-building in the country. It was decided that the Soviet side would continue providing technical documentation, deputing Soviet experts and training of Indian specialists at institutes. It was also decided that the experts of the sides will work out a detailed programme of further technical cooperation in the development of the institute.

In accordance with the decisions of the fourth session of the Commission a group of Soviet machine-building experts came to India in August 1978, which jointly with Indian organisations, worked out the above-mentioned programmes of further development of cooperation in the field of machine-building, and outlined concrete measures for their implementation. The group also agreed with the Indian specialists on the text of the long-term programme in the field of machine-building.

Questions connected with cooperation in the field of coal industry were discussed at the session of the Commission. It is noted that the Soviet and Indian organisations have completed the technical projects for the Ramgarh pit with a capacity of 3 million tonnes of coking coal per year, for the Central Mechanical Workshops at Singrauli deposits with a capacity of 21 thousands tonnes for repairing and manufacturing machinery per year, as well as for an experimental plot at the Nakrakonda mine, and agreed on the time-limit for completing the preparation of the technical project for the Jayant pit at Singrauli deposits with a capacity of 10 million tonnes of coal per year and for the Jhanjhra-1 mine with a capacity of 2.8 million tonnes at the Raniganj deposits.

The Soviet organisations agreed to acquaint Indian coal-mining experts, at the mines in the USSR, with the experience of developing powerful steep seams which become complicated due to tectonic

disorders, as well as with the experience of the work and exploitation of deep pits with the aim of its possible use in India. These questions are highly important for the further development of coal industry in India. In October 1978, Indian experts visited the USSR and acquainted themselves with the experience of solving the above-mentioned questions at Soviet coal enterprises. At present they are preparing a report on their visit. In case, it is accepted as purposeful, proposals will be prepared for streamlining cooperation in these fields.

During the session of the Commission contracts were signed for setting up tropospheric (tropo-scatter) communication link between the USSR and India which is under construction in accordance with the agreement between the Governments of the USSR and India, signed on April 22, 1977, during the visit of the USSR Foreign Minister A.A. Gromyko, to India.

This link will be constructed jointly by the Soviet and Indian organisations. The Soviet side will construct a receiving-transmitting station in the territory of the USSR and ensure its link with Moscow, manufacture and deliver to India the receiving-transmitting equipment, depute experts for its assembly, adjustment and commissioning, invite Indian specialists for consultation, and in case of need, train them in production technology.

The Indian side will construct the station in its territory and hook it up with New Delhi, and also manufacture and deliver antenna installations to the USSR.

The link will have 12 channels which will make it possible not only to carry the entire information load between the USSR and India, but also provide an opportunity to rent out part of the channels to other countries of South-East Asia and East Asia.

At present the link between the USSR and India is mainly through radio means which often does not ensure high reliability. The establishment of a direct and reliable link between the USSR and India will further promote the development of friendly relations between our two countries.

An important and prospective trend in Soviet-Indian cooperation, which was thoroughly discussed at the fourth session of the Commission, is cooperation in third countries. The sides noted with satisfaction that since the third session of the Commission, the Soviet and Indian organisations concluded contracts for delivering 18.9 thousand tonnes of metallurgical and other types of equipment manu-

factured in India at the Soviet-Indian cooperation plants—the Heavy Machine-Building Plant in Ranchi and Mining Equipment Plant in Durgapur—for projects under construction with Soviet assistance in third countries. The Ranchi and Durgapur plants have already started manufacturing and transporting part of the equipment. With the purpose of further developing this form of cooperation the Soviet organisations have agreed to inform the Indian side about the possible needs for equipment and metal structures, etc., for deliveries to third countries.

The sides also discussed the question of the participation of Indian organisations in executing the design and construction-assembly works at projects to be constructed with Soviet assistance in third countries.

The fourth session also examined questions connected with Soviet-Indian cooperation in the field of production cooperation and specialisation, questions of Soviet-Indian trade and cooperation in the field of science and technology, etc.

On the whole, it can be said with confidence that the fourth session of the Soviet-Indian Commission was a major step forward in the further development of all-round economic and technical cooperation between our two countries. It demonstrated that Soviet-Indian economic cooperation has a good future and broad prospects and that it occupies, by right, an important place in the broad spectrum of diverse and friendly ties between the peoples of the USSR and India.

Such are the basic results, state and prospects of Soviet-Indian economic and technical cooperation.

The Soviet Union attaches great importance to the strengthening of friendship, all-round development of our relations with India. What our teacher, the founder of Soviet state, V. I. Lenin, sincerely strove for, is coming true : the peoples of the Soviet Union and India are bound by genuine friendly relations.

Characterising these relations, L. I. Brezhnev said at the 25th CPSU Congress : “Close political and economic cooperation with India is our constant policy. The Soviet people regard with sympathy, and more than that, with a feeling of solidarity, the peaceful foreign policy of India, the courageous struggle of the progressive forces of the country for solving the difficult socio-economic tasks facing them. We wish the peoples and the Government of India complete success in this struggle.”

## LIST OF ENTERPRISES AND PROJECTS OF SOVIET-INDIAN COOPERATION

### I. PROJECTS BUILT AND COMMISSIONED FULLY OR PARTIALLY

#### **Metallurgical Industry**

1. Bhilai Steel Plant (Madhya Pradesh) with a capacity of 4 million tonnes of steel per year. A capacity of 2.5 million tonnes has been commissioned so far.
2. Bokaro Steel Plant (Bihar) with a capacity of 4 million tonnes of steel per year. The first phase with a capacity of 1.7 million tonnes has been commissioned.
3. Korba Aluminium Plant (Madhya Pradesh) with a capacity of 100 thousand tonnes of aluminium per year. A capacity for smelting 75 thousand tonnes of aluminium has been commissioned.
4. The institute of designing metallurgical enterprises, MECON, in Ranchi (Bihar).

#### **Coal Industry**

5. Surkhachar Coal Mine (Madhya Pradesh) with a capacity of 1.1 million tonnes of coal per year.
6. Banki Coal Mine (Madhya Pradesh) with a capacity of 600 thousand tonnes of coal per year.
7. Manikpur Coal Carrier (Madhya Pradesh) with a capacity of 1 million tonnes of coal per year.
8. Kathara Coal Washery (Bihar) with a capacity of 3 million tonnes of coal per year.

## **Mining Industry**

9. Rajhara-Pahar iron-ore pit (Madhya Pradesh) with a capacity of 4 million tonnes of ore per year.
10. Nandini Lime Carrier (Madhya Pradesh) with a capacity of 2.1 million tonnes per year.

## **Oil Industry**

11. Oil works of the Oil and Natural Gas Commission (ONGC) in Gujarat (Ankleshwar, Kalol, Navagam, etc.). The oil extraction in 1977-78 accounted for 4.2 million tonnes.
12. Oil works of the ONGC in Assam (Lakva, Rudrasagar, etc.). In 1977-78 the extraction accounted for 1.35 million tonnes of oil.
13. Offshore Oil and Gas Seismic Prospecting (15 structures set up).
14. Barauni Oil Refinery (Bihar) with a capacity of 3 million tonnes of oil per year.
15. Koyali Oil Refinery (Gujarat) with a capacity of 3 million tonnes of oil per year.

## **Electricity**

16. Neyveli Thermal Power Station (Tamilnadu) with a capacity of 600 thousand KW.
17. Bhakra Hydel-power Station (Punjab) with a capacity of 600 thousand KW.
18. Korba Thermal Power Station (Madhya Pradesh) with a capacity of 200 thousand KW.
19. Obra Thermal Power Station (Uttar Pradesh) with a capacity of 250 thousand KW.
20. Mettur Hydro-power Station (Tamilnadu) with a capacity of 224 thousand KW.
21. Patratu Thermal Power Station (Bihar) with a capacity of 400 thousand KW.
22. Harduaganj Thermal Power Station (Uttar Pradesh) with a capacity of 100 thousand KW.
23. Hirakud Hydro-power Station (Orissa) with a capacity of 25 thousand KW.
24. Balimela Hydro-power Station (Orissa) with a capacity of 360 thousand KW.



## **Machine-Building**

25. Ranchi Heavy Machine-Building Plant (Bihar) with a capacity of 80 thousand tonnes of equipment per year.
26. Durgapur Mining Equipment Plant (West Bengal) with a capacity of 45 thousand tonnes of equipment per year.
27. Bharat Heavy Electricals, Hardwar (Uttar Pradesh) for manufacturing thermal and hydraulic turbines and generators for them with a capacity of 2.7 million KW and electric machines with a capacity of 515 thousand KW.
28. The Central Electro-mechanical Workshop in Korba (Madhya Pradesh) with a capacity of repairing 7.5 thousand tonnes of equipment per year.
29. Precision Instruments Plant, Kota (Rajasthan) with a capacity of 538 thousand instruments per year.
30. Plant of Optical Lenses in Durgapur (West Bengal) with a capacity of 300 thousand optical pieces per year.
31. Plant of Files in Calcutta with a capacity of 720 thousand files per year.
32. Surgical Instruments Plant in Madras with a capacity of 2.5 million pieces per year.

## **Pharmaceutical Industry**

33. Antibiotics Plant at Rishikesh (Uttar Pradesh) with a capacity of 238 thousand tonnes per year.
34. Synthetic Drugs Plant in Hyderabad (Andhra Pradesh) with a capacity of 850 tonnes per year.

## **Agriculture**

35. The State Mechanised Agricultural Farm in Suratgarh (Rajasthan).
36. State Agricultural Farm in Jullundur (Punjab).
37. State Agricultural Farm in Hissar (Haryana).
38. State Agricultural Farm in Raichur (Karnataka).
39. State Agricultural Farm in Jarsuguda (Orissa).
40. State Agricultural Farm in Kannapara (Kerala).

## **Technical Education**

41. Indian Institute of Technology Bombay, for 2 thousand students and 300 post-graduates.
42. Autonomous Faculty of Aircraft-Designing in Bombay.
43. Autonomous Faculty of Metallurgy in Kharagpur (West Bengal).
44. Autonomous Faculty of Geophysics in Hyderabad (Andhra Pradesh).
45. Autonomous Faculty of Automation and Computer Technology in Bangalore (Karnataka).
46. Technical School for Metallurgy in Bhilai (Madhya Pradesh).
47. Technical School for Oil and Gas Industry in Baroda (Gujarat).
48. Technical School for Machine-Building in Ranchi (Bihar).
49. Technical School for Electronics in Hyderabad (Andhra Pradesh).
50. Technical School for Machine-Building in Bhopal (Madhya Pradesh).

## **Communications**

51. A Radio Station in Calcutta with a capacity of one thousand KW.

## **II. COOPERATION PROJECTS UNDER CONSTRUCTION OR AT DESIGNING STAGE**

### **Industry**

52. Refractory Materials Plant at Bhilai (Madhya Pradesh) with a capacity of 110,000 tonnes per year.

### **Mining and Metallurgy**

53. Coal Pit at Ramgarh (Bihar) with a capacity of 3 million tonnes per year.
54. "Jayant" Coal Pit at Singrauli (Uttar Pradesh) with a capacity of 10 million tonnes of coal per year.

55. Jhanjhra-1 coal mine in Raniganj (Uttar Pradesh) with a capacity of 2.8 million tonnes of coal per year.
56. Experimental Works at Nakrakonda and Chinakuri mines (Bihar).
57. Alumina plant with capacity of 600,000 tonnes per year (Andhra Pradesh).
58. Iron ore pit in Dalli (Madhya Pradesh) with a capacity of 2.5 million tonnes per year.
59. Copper Ore-enriching Complex at Malanjkhand (Madhya Pradesh) with a capacity for extraction and processing three million tonnes of ore per year.
60. Reconstruction of the Panna mine for extracting diamonds (Madhya Pradesh).

### **Oil Industry**

61. Geological prospecting for oil and gas in Gujarat, Assam, West Bengal, Tamilnadu, Tripura, etc.
62. Mathura Oil Refinery (Uttar Pradesh) with a capacity of 6 million tonnes per year.
63. Scientific-Research Institute of Drilling Technology in Dehra Dun (Uttar Pradesh).

### **Electricity**

64. Hydro-power Station Lower-Sileru (Andhra Pradesh) with a capacity of 690 thousand KW.
65. Hydro-power Station Linganamaky (Karnataka) with a capacity of 52 thousand KW.

### **Machine-Building**

66. Tractor Plant in Loni (Uttar Pradesh) with a capacity of 10 thousand pieces per year.
67. Institute of Designing Metallurgical Equipment in Ranchi (Bihar).
68. Scientific-Research Institute for Ferrous Metallurgy in Ranchi (Bihar).

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The traditional friendship between the Soviet Union and India facilitated the signing of the Friendship Treaty with the USSR in the trying days of the Bangladesh freedom struggle in August 1971.

The Inter-Governmental Commission set up in pursuance of the provisions of the Treaty has been doing commendable work in strengthening and broadening mutually-beneficial multilateral cooperation in the economic, scientific and technical fields. Since its inception in September 1972, the Commission has taken a number of important initiatives which have led to the expansion of areas of mutual cooperation and opened up new horizons of economic activity.

In this booklet the author gives an account of Soviet credits extended to India for various projects, surveys the present state of economic and scientific cooperation and dwells in detail on the main branches of Soviet assistance like steel, oil and power. Key projects like the Bhilai and Bokaro steel works, the Koyali and Mathura oil refineries, the Rishikesh and Hyderabad pharmaceuticals are dealt with in some detail.

Based on projections of the expert bodies of the Joint Commission, the author also gives a profile of future cooperation which will take into account the possibilities and potentialities of the sides, will include chalking out of long-term plans and will encompass such diverse fields as production cooperation, specialisation and the building of joint projects in third countries.

The author is the Counsellor for  
at the USSR Embassy in India.



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