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GLOSSARY

ASSR	Autonomous Soviet Socialist Republic
CPSU	Communist Part of the Soviet Union
Gosplan	State Plan
Guba	Gulf (at the mouths of several of the rivers in Northern Russia)
Komsomol	Communist Youth Movement
Kray	Administrative Region
NP	North Pole
Obkom	Oblast' Committee
Oblast'	Administrative Region
Okrug	Administrative Region
Rayon	Administrative Territorial Subdivision
RSFSR	Russian Soviet Federated Socialist Republic
SSR	Soviet Socialist Republic
Taiga	Dense Forest Between Tundra and Steppe
Tundra	Mossy and often Marshy plains in Northern Russia

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ARCTIC

New Drift Station NP-15

The advance party has reached the newly established drift station NP-15. The camp has been established on an ice floe which is located about 1400 kilometres to the north-east of Tiksi. Aircraft of the Polar Aviation make 8 to 9 trips daily from Tiksi to NP-15 with supplies for the station. The first three huts of a total of eight, have been assembled.

V. V. Panov is in charge of the station. The ice floe on which the station is being set up is 9 kilometres wide and the ice is about 4 metres thick.

Vodnyy Transport
16 April 1966
Page 4 (Abridged)

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AGRICULTURE & FISHERIES

Seal-Hunting Icebreaker

A seal-hunting icebreaker is being designed which will be able to operate in heavy ice, and will have hold-space for the products from 100 thousand marine animals. This huge ocean-going base will carry a three-month supply of fuel, water and provisions and will therefore be able to put out to sea on a hunting expedition at any time of year. It will be equipped with a hangar and landing pad for several helicopters which will be used for reconnaissance and delivery of the kill to the ship.

Trud
26 June 1966
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(Summary)

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CONSTRUCTION

What Would You Like?

Vorkuta. The Leningrad Zonal Scientific and Experimental Design Institute for Standard and Experimental Design of Living and Communal Buildings sent the residents of Vorkuta 25 thousand questionnaires on what they would like to see incorporated in the design of northern towns and villages.

The request brought many useful suggestions which will be evaluated and considered in the designs.

Sovetskaya Rossiya
28 May 1966
Page 6 (summary)

A Department Nonetheless

Kandalaksha, Murmansk Oblast'. The Kandalaksha Construction Department maintains that the departmental system is still the better way to organize construction work, as opposed to the trust system. It cites its own experience as a self-accounting enterprise that employs between 600 and 650 workers and has a budget of over 2,368 thousand roubles as an example. It deals directly with the purchasers of its goods and services. It can see no problem in organizing cultural-welfare and living accomodation construction if there are adequate funds available. The same is said of funds for expansion of production. The funds for material stimulus are supposed to be handled by the collectives of efficiently operating enterprises. There is no difficulty in determining who is to pay for the basic funds, the payer will be whoever is the user of this capital.

Stroitel'naya Gazeta
15 June 1966
Page 3
(Summary)

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Reliable Equipment for Builders in the North

Derrick type and mobile cranes and excavators are able to fulfill only 60-70% of their norms, while tractors fulfill only 25%, on construction projects in Yakutiya.

It is mandatory that equipment suitable for operation in the harsh climatic conditions of the permafrost zone be designed. Hydraulic equipment capable of operating in extreme cold, below the currently specified minus 35 to 50 degrees Centigrade, is required. Electrical cable insulation must be designed to withstand the extreme frost of the north. Each piece of heavy equipment should have a heated operators cabin.

Stroitel'naya Gazeta
17 June 1966
Page 3
(Summary)

The Northerners are designing this Building

Foreign tourists are impressed with Murmansk's modern appearance, its new buildings, paved streets, new harbor etc.

Construction at Murmansk follows the same pattern as in other trans-polar regions. Most of the buildings are put up by the large panel method. Many of the parts are made in Moscow or Leningrad and a portion of the shipping cost is compensated for by lower final prices for such parts than is the case in other northern areas.

From this it may be assumed that the future of northern construction lies in the creation of a chain of inter-rayon bases for large-panel construction in the middle belt of the Republic. These bases should produce building parts according to standard designs which take into account the climatic conditions of the various northern regions. Unfortunately, the quality of the design sometimes leaves much to be desired.

Recently, a standard design for industrial accomodation and large cultural welfare buildings was developed for the Murmansk area. The basis of this design was not, unfortunately, scientific recommendations, but a desire to make the most of the high cost of northern construction. Apparently,

/specifications for

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specifications for northern construction consist of nothing more than window frames with triple glass and a special locker for drying clothing to which a heat supply is not provided. The walls of large panel buildings are coated with a crust of rock brought either from Estonia or the Urals. The facades turn out to be an ugly monotone. Even moisture resistant paint fades and peels after a few years of attack by northern winds, blizzards and frosts. Bit by bit, even the walls fall apart.

Severomorsk already has a building that was faced with ceramic blocks. These do not require maintenance for as much as 7 or 8 years. However, Gosstroy RSFSR does not authorize the use of these blocks, because this would add to the cost of housing. We figured out that the additional cost would be recovered in 3 to 5 years due to the great increase in the length of maintenace-free periods. But here again we ran into red tape. Capital construction and capital repair are financed from different sources and even through different banks. Obviously, the problem is one of different departments, since the money is still state funds.

The problem of the ideal design for a northern building can only be solved by a specialized research center but, until one is provided, we have to be guided by what has been learned through experience.

It is necessary to build high-rise buildings in the cities. Nine to twelve storey buildings would make it possible to erect compact cities in the complicated hydrometeorological and terrain conditions of the Kola Peninsula. Such buildings are suitable for erection on permafrost. The Far northern City must also have a system of services as close as possible to the dwelling complexes. The ideal situation would be to have restaurants, shops, evening cafes, clubs, gymnasiums and accomodation for extra-school work with children under a single roof, and the whole connected with the living quarters by covered passageways.

One wants to see winter gardens with transparent roofs in the northern city of the future. Children could play in these gardens during blizzards and the polar night. A point to keep in mind is that children make up 40% of the population in the Kola Peninsula. We are not talking about creating banana-belt conditions in the north. An active holiday in close contact with harsh, but beautiful nature is the best cure. For this reason, outdoor sports facilities are a necessity: sledding, skiing, fishing and hunting camps.

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We are of the opinion that the architectural-esthetic appearance of the transpolar dwellings, apartments and cities should be changed. The buildings should be faced with natural stone and brightly colored decorations and large windows; the balconies could be omitted since they are useless out here.

In addition, the landscape should be incorporated into the city plan, sanitation facilities improved, ceilings could be up to three meters high and an efficient air conditioning system provided. All these and other improvements will result in increased cost of construction, but these costs will be recovered in the improved health and well-being of the Northerners.

A law should be passed that would forbid the commissioning of new industrial capacity before the necessary suitable living accomodation had been provided. The author of this article was: A. Antonov, Chief of the Murmansk District Divisional Office for Construction and Architecture.

Sovetskaya Rossiya
24 July, 1966
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(Abridged)

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ECONOMIC DEVELOPMENT

Efficient Utilization of Yakutiya's Natural Resources

The accelerated development of production forces in the regions of Siberia and the Far-East is an important national economy task for the Five-year Plan. The directives of the XXIII Congress of the CPSU for the five-year Plan of development of the national economy in the USSR during the period 1966 to 1970 envisage further increases in the mining of gold, tin, mica and diamond in the republic. A start will be made on the industrial development of new natural diamond deposits, the construction of the Deputatskiy tin-ore concentrating combine, and the scope of prospecting and survey work will be increased.

The development of productive forces in Yakutiya is taking place under unique conditons. Yakutiya, like the other regions of the North, has a number of regional peculiarities: remoteness from the industrial centers of the country; extended and sparsely populated territory; sharply continental climate; widespread occurrence of permafrost and the poor development on the one hand, into those which are constantly operative (natural-geographic) and temporarily operative (economic) and, on the other hand, into those which cause production costs to fluctuate.

In spite of the fact that the territory has been poorly studied from the geological point of view in comparison with other parts of the country, the republic is known to have large reserves of gold, diamonds, tin, amber mica, hard coal, copper, wolfram, polymetals, mercury, natural gas, coking coals, irone-ore and common salt. Based on discovered raw mineral resources, a mining industry has been created for the extraction of gold, diamonds, tin and amber mica which determines the specialization of the republic in the All-Union division of labor. From 1959 to 1965 the production of diamonds has increased by 15.8 times, of tin by 2 times, of gold by 40.4%, and of mica by 54%.

Nevertheless, the level of development of natural resources in the republic is extremely low. Thus, of the explored reserves of a commercial category, at the present time the extraction of diamonds is less than 1%, tin 1.3%, gold 6%, and amber mica 2.5%. There is no development of the country's largest reserves of high quality coking coals and iron-ores in southern Yakutiya non-ferrous and rare metals and table salt. It is worth noting that, for the purpose of bringing these deposits into the national economy, the necessary technical-economic investigations have been done and the high effectiveness of exploitation has been proven.

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The economic feasibility of development of many of the deposits is conditioned, in particular, by their concentration on a comparatively small area, the favorable mining-geological conditons and the high content of useable materials. Thus, the capital investment in the diamond-mining industry of Yakutiya has already been recovered, even though the enterprises for this branch were set up in a completely uninhabited region, remote from transportation arteries and, naturally, required increased expenditures. Specific capital investments in the Deputatskiy tin-mining enterprise, which is producing the cheapest tin concentrate in the country, are from 15 to 20 times less in comparison with specific capital investments in tin-mining enterprises in other region of the Soviet Union. Gold from the Yakutiya deposits is also among the cheapest in the country. Nonetheless, in 1958 a marginal cost for gold-mining was established and the industry accepts only those deposits and sectors, provided by the geological-prospecting organizations, where the metal content will ensure extraction at the established cost; the remaining deposits are not worked.

The result of such an artificial approach is to limit the raw materials base for the mining enterprises. Computations show that it is economically better to develop those sectors where prospecting operations have been completed, rather than to leave the gold in the ground and to conduct search and exploration in other regions that are situated hundreds of kilometers away from operating enterprises.

In perspective, there will be further development of the diamond-mining industry by introducing a third concentration plant at the the town of Mirnyy, the conversion to year-round operation and expansion of the concentrations plant at Aykhal and the development of a new diamond-bearing pipe at "Udachnaya". At the present time, the Yakut ASSR has given the USSR three of its greatest tin-bearing regions: the Severo-Deputatskiy, Tsentral'no-Yanskiy and the Yuzhno-Yanskiy, which contain a considerable part of all the explored reserves of tin in the country. The republic can therefore become the main tin-producing region of the Soviet Union. On the basis of only the Deputatskiy tin ore deposit it is possible to set up a highly economic enterprise with capacity equal to the production of all the presently existing tin producing enterprises in the country. An equivalent enterprise can be set up on the basis of the Yuzhno-Yanskiy tin-ore deposits. The cost of tin at these enterprises will be half as much as the average for the country. There are great possibilities also in the mica, coal, timber and light industries, as well as in agriculture.

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Future expansion of production in these branches requires accelerated development of energy resources and the building-materials industry. The latter is far behind current requirements. It need only be stated that per million rubles of construction work, the production of wall materials is 4 times less, and that of structural reinforced concrete 11 times less than the average for the USSR. Setting-up building - materials enterprises in each or in several regions does not solve the problem of accelerating production lowering the cost of construction. This is so because the construction of these enterprises would require a long time, increased expenditures, as well as importing a labor force for which it would be necessary to build living accommodation at the expense of limited local resources of building materials.

In order to save time and to raise the efficiency of utilization of natural resources in Yakutiya, it is necessary to set up several highly mechanized building industry bases and to deliver ready-made parts and structures to the areas of new construction. Even the increased transportation cost incurred by the use of helicopters will be recovered due to the reduction in construction time and lowering the expenses for setting-up individual, regional, small, building-materials enterprises.

In the period during which the building industry bases are being constructed in Yakutiya it would be expedient to deliver reinforced concrete articles, metallic frames and wall panels from Krasnoyarsk and Irkutsk. Computations show that reinforced concrete delivered to Yakutsk will cost 25 rubles per cubic meter more, but the utilization of delivered panels in comparison with utilization of local brick will provide an economy in the range of 5 to 10 rubles per square meter of wall. This fact will provide the basis on which to propose to the planning organizations that socks of structural reinforced concrete and wall-panels be released from the Krasnoyarsk and Irkutsk plants for Yakutiya.

However, the most backward sector in the Republic is energy. In 1964, the yearly production of electrical energy per person was 864 kw/hours, whereas in the RSFSR it was 2420. Early completion of construction on the Vilyuysk hydro-electric power station and the Chul'mansk state regional electric power station, increased rate of construction on the Yakutsk state regional electric power station, as well as a start on the construction of the hydro-electric power station on the Adycha river and the inter-river Dzhebariki-Khaysk state regional electric power station, and the construction of power transmission lines will make it possible to increase the rate of development of production forces in the near future.

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In addition to the existing branches of the economy, the available natural resources make it possible to create a number of new branches of industry in the Republic. Southern Yakutiya has one of the largest hard coal basins in the USSR; it has all grades of coal, including coking coal. The basin's geological reserves amount to approximately 40.8 billion tons. Explored reserves ensure the mining of 7.4 million tons of coking coal per year. According to the Institute "Tsentrogiproshakht" (State Institute for Mine Planning) the cost per ton of coal is 4.1 roubles and for enriched coal it is 4.9 roubles.

The development of Southern Yakutiya's coal is being delayed, in spite of the presence of explored and highly economical raw material. It is the custom to think that this basin must be developed in a complex with the construction of ferrous metallurgy enterprises in Southern Yakutiya or in the regions east of Lake Baikal. Coal from Southern Yakutiya is a little more than twice as cheap as that from the Kuznets Basin. By shipping 5 million tons of coal concentrates from Southern Yakutiya to the Pacific Ocean countries in comparison with shipment from the Kuzbass, the yearly saving will make it possible to build a railroad from Bam to Chul'man, a distance of 437 kilometers, which will permit shipment of coal to Vladiovostock. A yearly export of 5 million tons of enriched coal from Southern Yakutiya at a world market price of 10.4 dollars per ton will give the country more than 50 million dollars in currency.

Five large gas fields have been discovered in the Republic along the Vilyuy river. The geological evaluation of these fields amounts to 5 or 6 trillion cubic meters. At the present time a gas pipeline is being built from Ust'-Vilyuy to Yakutsk to Pokrovsk to Bestyakh for a distance of over 400 kilometers. When the construction is completed and gas service is installed, gas will be supplied to the industrial, communal, cultural and welfare establishments, and for the every day necessities of the workers of the regions along the gas pipeline as well as the builders at the Yakutsk State regional electric power station.

Nevertheless, the expenditure of gas for this purpose will not be great. The remaining reserves could be utilized in the production of channel black. It is known that soot production consumes much gas. In order to obtain 1 kilogram of high quality channel black, an expenditure of 50 cubic meters of natural gas is required.

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At the present time, in the USSR, the operating soot plants, situated in regions where the fuel-energy balance is strained, consume about 2.5 billion cubic meters of gas. The use of gas in soot production inflicts a great loss on the national economy, it makes it necessary to increase coal production, the cost of which in terms of standard fuel exceeds the cost of gas by 10 roubles. This makes it expedient to concentrate production of active soot at the gas fields in the Yakut ASSR. Figures show that, at the anticipated cost of thousands of cubic meters of Middle Vilyuy gas being 0.3 roubles per ton, the most expensive channel soot FOB will not exceed 125 roubles per ton compared with 136.2 at the Dashavsk plant 181.8 roubles at the Utin plants.

According to preliminary data, approximately 5 billion cubic meters of gas will be required by 1970 to satisfy the national economy demands in the USSR for active soot. It is therefore expedient to expand soot production in the Yakutiya ASSR and to increase the extraction of gas.

At the same time, there will be extracted, along with the gas, 500,000 cubic meters of condensate consisting of diesels, benzene fractions and propane-butane mixture which will provide a yearly outpt of 350,000 tons of high quality liquid fuel (up to 70% benzene) costing about 20 roubles per ton (the cost of imported benzene is 84 roubles). Consequently, in the near future the gas from Yakutiya gas fields can be utilized as follows: for provision of gas service, for production of channel soot and for production of liquid fuel.

Several rich lead-zinc deposits are known in the Republic. The ores at these deposits are characterized by high content of lead (7.8%) and zinc (6.8%). The large Agylkinskoye copper-wolfram deposit has been explored. High output enterprises can be set up on the basis of the deposits described.

Yakutiya possesses timber reserves which amount to about 11 billion cubic meters, i.e., 15% of the timber reserves in the Soviet Union. The republic's timber reserves are used mainly to meet internal requirements. The estimated yearly amount of timber cut is about 2 or 2.5%. The volume of timber felled without damage to renewal of timber resources can be raised to 100 million cubic meters, while at the present time only 3.5 million cubic meters are cut.

For the purpose of timber exports, the most interesting is the Pacific Ocean market, being the nearest and most eager customer for timber in relation to the raw material and production capacities of the Republic. The export of piling timber to Japan deserves serious attention, the requirement there in connection with the filling-in of marine bays is growing fairly rapidly. Dahurian larch has been successfully used as piling timber.

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The development of Yakutiya's production forces depends to a great extent on the condition of communications. The existing scheme of transport development in the eastern part of the Arctic is characterized by unilateral shipment of freight. The freight-carrying capacity of ocean-vessels on the return trip is utilized to no more than 10%. Loading sea transport with timber will sharply increase the efficiency of its utilization.

According to our computations, the cost of shipping timber to the Far East through the port of Tiksi and along the Northern Sea Route will amount to 0.02 kipeks per ton-kilometer: the transportation cost for shipment of a ton of freight amounts to 1.5 roubles, while the import of freight into the Arctic costs 16.5 roubles according to the plan, and actually comes to 28.1 roubles in practice. This tariff has to be spread over the freight being shipped from Tiksi to the Far East, which is hardly expedient. Proceeding from the projected volume of freight shipments in the eastern part of the Arctic and applying a coefficient of utilization for the merchant-fleet of 0.6, the possible volume of timber loaded can amount to 200,000 cubic meters per year and, by 1970, to 315,000 cubic meters.

Timber export, with the abundant reserve capacity for the logging industry, does not require large capital investments and the advantages are obvious: the cost of Yakutiya timber (pilings of the larch species) on the Japanese market cost $25.00 per cubic meter, whereas the specific capital investment into the organization of export on a scale of 500,000 cubic meters of timber amounts to 18 roubles, the expenditures for cutting and shipping of timber are relatively small. Further increase in deliveries of timber for export depends on how quickly and reliably the problem of reloading ships arriving with freight in the eastern part of the Arctic will be resolved and tariffs regulated.

The development of the rich natural resources of the Yakut ASSR and all of the North-eastern USSR depends directly on the availability of a transportation network. This problem can be principally solved by construction of a railroad trunk line. During the post-war period (1948 to 1952) the design organizations of the MPS (Ministry for Communications USSR) carried out extensive technical-economic studies of different versions of railroads. In our opinion, the version of a line running from Bam to Tynda to Chul'man to Tommot to Yakutsk to Khandyga to Arkagala is convenient. This version of railroad construction would utilize the bed and other structures built earlier for the line from Bam to Tynda, and a number of other important problems would be solved: the Southern Aldan coking coals are brought into the national economy, and conditions are created for building a great metallurgical base east of Lake Baikal on the basis of the Southern Aldan iron-ores, coking coals and mica deposits.

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The railroad from Bam to Tynda will create necessary conditons for the development of the Udokan copper deposits, it will significantly lower the operating costs in the gold and mica industries of the Aldan region, it will lay the groundwork for improving the transportation scheme for delivery of freight to the northeastern part of the USSR when the road reaches Tommot, which is on the navigable part of the Aldan river, it will lay the basis for construction of the North Siberian Trunk Railroad running from Tayshet to Ust'-Kut to Nizhne-Angarsk to Chara to Tynda to Bam.

The creation of the Tommot rail and water transportation hub will reduce the shipping time to the northeast from 11 to 24 months down to 4 or 6 months, it will lower transportation costs and various types of losses caused by long transportation time. Thus, after the rail line is built to Tommot, the transportation costs for delivery of a ton of freight in comparison with vehicular transport will be reduced by 84%, and in comparison with delivery by water transport through the port of Osetrovo it will be reduced from 78 to 16 roubles. Delivery of freight to Khandyga (a port on the Aldan river) through Tommot, and not through Osetrovo, will cut transportation costs in half. A rail-head at the shipping warf at Tommot on the Aldan river will make it possible to organize mixed railroad shipments, which will sharply reduce the time for delivery of freight to the gold-mining industry of the Allakh-Yunye and on the Upper Indigirka. The presence of the railroad from Bam to Tommot will create the necessary favorable conditions for the development of tin mining based on the southern Yakutiya group of tin deposits, copper-wolfram industry on the Agylkinskoye deposits and a lead-zinc industry.

Since the cost of construction of the railroad from Bam to Chul'man will be distributed over the branches of industry concerned, the cost to each will be relatively small, not to mention the fact that the operating branches (gold-mining, mica, timber, geological prospecting etc.) will greatly improve their economic indices due to the reduction of transportation costs, which should be included in the determination of the feasibility of the railroad.

The necessity for quick construction of the railroad from Bam to Chul'man with subsequent extention to the city of Tommot is also due to the fact that the existing year-round vehicular road, which carries more than 600,000 tons of freight and connects the regions of Southern Yakutiya with the railroad, is in an unsatisfactory condition. Its repair and, in a number of cases, its reconstruction require very large capital investments that would be better used for construction of the railroad.

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Another important economic problem is the liquidation of unilateral shipments along the Lena river. River boats with total freight capacity of about one million tons travel empty up to the port of Osetrovo, where the Tayshet to Lena railroad comes out. Unfortunately, the Gosplan and the Ministry for River Fleets of the RSFSR have not, up to this time, taken steps which would either liquidate or at least limit the scale of unilateral shipments. On the contrary, this abnormality is legalized, since the cost of shipment includes all the expenses associated with empty return of boats. In fact the established remunerative rates for Lena river shipping are nearly 70% higher than the over-estimated, planned cost of shipments.

As a result of the unjustifiably high tariffs for shipment of freight, Lena river transport obtains incomes which are yearly figured in the million of roubles. However, this income is the result of excessive transportation costs for shipment of freight to Yakutiya. This increases the cost of industrial products and construction work and, in the final analysis, creates an artificial barrier in the way of development of the natural resources of the north-eastern part of the country.

Unilateral shipment and over estimated tariffs are also characteristic of the vehicular, air and marine transport bringing freight into Yakutiya. It is perfectly obvious that it is necessary to apply false tariffs to freights delivered by empty boats, and these could only be compensated for by additional costs which would arise from loading empty boats and truck with freight. The author of this article was: V. Mel'nikov, Director, Department of Economics, Yakutiya Branch of the Siberian Department of the Academy of Sciences USSR.

Planovoye Khozyaystvo
No. 4, April 1966
p.p. 17-22

Exploration for Gas

Members of the Narykary Expedition will soon set out for Urengoy. At the present time they are surveying the gas deposits in the Near-Ob' (Priobskaya) area.

In January-February 1966 the Shukhtungortskaya party was drilling on the banks of the river Izyum-Yugan. This allowed to define the contour of the Ozernyy gas deposit. Gas has also been found at the Sote-Yuganskiy deposit.

The Urengoy area has been surveyed by the "Seismic" method and drilling will be started soon.

Sovetskaya Rossiya
14 April 1966
Page 5 (Extracts)

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Resources of Western Siberia

The West-Siberian plain represents a unique area rich in gas and oil. The first traces of oil were found in 1960. At the present time the number of known deposits is approaching thirty. Nine of these have been found very recently. All deposits and especially Ust'Balykskoye, Pravdinskoye and Samotlorskoye stand out by the high quality of the oil and high yield of wells.

Twenty gas deposits have been explored including those of Purovskiy, Tazovskiy and Yamal'skiy all of which are located in the new areas. All of these deposits are substantial. The Purpeyskiy deposit for instance has reserves estimated at 450-500 billion cubic metres.

Geologists from Tyumen' have found and surveyed large reserves of iodine containing waters. Commercial size deposits of tantalum have been found in the area of Polyarnyy Ural.

Ekonomicheskaya Gazeta
No. 14, April 1966
Page 26 (Extracts)

Early Start of the Diamond Season

The river Irelyakh is popularly known as the "Sea of Diamonds" for placers of this mineral have been found on the banks and at the bottom of that river.

The "navigation season" for dredges has started. In order that dredges could operate, over 6000 cubic metres of ice two metres thick had to be removed from the surface of the water. Dredge No. 201 is now in operation. This is the first time that the diamond season has been opened this early in the Yakut ASSR.

Trud
8 April 1966
Page 1 (Abridged)

.../16..

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Document divulgué en vertu de la Loi sur l'accès à l'information

New Construction in Apatity, Murmansk Oblast'

The main building of the second concentrating plant will be expanded by 120 metres. Work has been started for the reconstruction of the S.M. Kirov mine. A 80 apartment building is being completed in the residential area of Apatity.

Stroitel'naya Gazeta
22 April 1966
Page 1 (Extracts)

Expansion of the Noril'sk Combine

"-------to expand the Noril'sk combine through the development of the rich copper-nickel deposits of Talnakh". This means that even in 1966, the mine Mayak will produce an equal amount of ore as the old mine "Zapolyarnyy". In the near future, the mines Mayak and Komsomol'skiy will have an output equal to the total production of all presently worked mines of the combine.

Trud
23 April 1965
Page 3 (Extracts)

New Medical Facilities for Vorkuta

Construction has been started on a medical complex. This will include an X-ray centre, a children's hospital, a general hospital, maternity building and tuberculosis treatment facilities.

Sovetskaya Rossiya
24 April 1966
Page 4 (Full text)

.../17..

Document disclosed under the Access to Information Act
Document divulgué en vertu de la Loi sur l'accès à l'information

Development of the Khanty-Mansiysk National Okrug

The following are extracts from an article on the development of the Khanty-Mansiysk National Okrug or "Yugra" as it is called locally.

-----the combine in the Konda river basin produces nearly 1.5 million cubic metres of timber per year. More could be produced but transportation along the river Konda is limited. This situation will be changed once the railway line from Tavda is completed.

The railway line Ivdel'-Ob' is nearing completion. Important timber concerns (Lespromkhoz) have been built along this line. To mention but a few----------Lyavdinskiy, Ousskiy, Kershal'skiy, Pelymskiy, Atymskiy, Pionerskiy, Komsomol'skiy, Sovetskiy---------

During the first quarter of 1966, over two million cubic metres of timber (pine) have been produced in the Okrug. This amount exceeded the plan by 57,000 cubic metres.

Sovetskaya Rossiya
24 April 1966
Page 2 (Extracts)

Aykhal--The Diamond City

Plans for the construction of a comfortable, weather-proof city at the site of the Aykhal diamond mines in Yakutiya have been drawn-up, agreed to, and verified to be feasible, but that is as far as the matter has gone. Under the conditons prevailing at Aykhal, one square meter of living space, using the concrete block method of construction, costs 516 roubles. The same space, using wood construction, costs 412 roubles. By comparison, the same amount of living space in the ultra-modern design city would cost only 297 roubles.

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The planners were able to achieve this remarkable saving in costs mainly by utilizing local building materials. Raw materials found at Aykhal are suitable for making heavy silicate concrete for use in bearing structures (grade 300 or better), and porous concrete light enough to be used for enclosing walls.

The projected city is not exceptionally large, the heavy equipment to do the work is available on the site, and authorization to begin work has been granted, but a start has not been made. It would appear that the responsible authorities are more concerned with the completion of the hydroelectric power station.

Economicheskaya Gazeta
June 1966
Page 33
(Summary)

Changes in the Map

The new map of the Kranoyarsk Kray will have many changes in it. Such communities as those at Koshurnikovo, Sayanskiy, Sisim, Zelenyy Bor, Chistyye Klyuchi(Pure Springs), and Shetinkino, along the Abakan Tayshet railroad, were born with that rail line and now have populations of over two thousand each. Within the Arctic Circle, the settlement of Snezhnogorsk came into being at the site of the Khantayskiy Hydro-electric Power Station, while Talnakh grew up at a copper-nickel ore deposit. Borodino, on the site of the Irsha-Borodin coal section, has come into being in the past decade. The latest additons to the list are the settlements along the Achinsk-Abalakovo rail line, which will be opened this year. A large railroad workers' settlement has grown up around the sation at Surikova. Five km away, the settlement of Rassvet has grown to 3,500 population at the large Il'inskiy Timber Combine.

In ten years, about one hundred new populated points have been registered in this Kray, including thirty large workers' settlements.

Izvestiya
2 June 1966
Page 6
(Abridged)

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Document divulgué en vertu de la Loi sur l'accès à l'information

Survey for a Power Line

Surveying has begun on a route for a high-voltage transmission line from the Tyumen' thermal-electric power station to the oilfields of Shaim and Surgut.

Sovetskaya Rossiya
3 June 1966
Page 4
(Summary)

Cities will Grow in the Taiga

Since the northern oilfields were opened up, more than 200 thousand sq m of living space, cultural and welfare buildings have been built in those areas. Another 125 thousand sq m of accomodation must be built during the Five-year Plan, mainly in the cities of Surgut, Urai, and in the workers' settlements of Nefteyugansk, Nizhnevartovsk and Megion.

Last year the construction workers exceeded their quota by 60 thousand sq m of living accomodation. However, the state of construction has been complicated by insufficient delivery of slate, brick, wood fiberboard sheets and other building materials, as a result of which only 13.3 thousand sq m of living area was built. The loss of valuable time has made it necessary to complete 70% of the construction during the last half of the year. The construction workers propose to make every effort to overcome this handicap.

Last year, the first step towards replacing wooden dwellings with four and five-storey blocks was taken in the Tyumen' Oblast'. Unfortunately, the plans to erect 45 thousand sq m of such accommodation miscarried, and only 10 thousand sq m were put up. The fault lies with the suppliers of building materials in the adjacent Oblasts. The situation is no better this year, and the short supply of brick is alarming. The Gosplan RSFSR has allocated funds for only 60% of the required amount of brick. During a four-month period, the Sverdlovsk Oblast' enterprises have supplied only 4 million of the 19 million bricks they were to provide. The deliveries from the Omsk Oblast' are not better. The suppliers must realize that such freight can only be delivered during the short, four-month navigation season, hence, if building materials are not delivered before the first of September, the construction workers will not be able to meet their quote of construction work.

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These and other problems in northern construction could be solved, to a great extent, by repeating the experience of the Bashkir and Kuybyshev oilfields. Whole construction collectives were brought to these Oblasts from the other areas. The same procedure here would do much to alleviate the problem.

Stroitel'naya Gazeta
3 June, 1966
Page 3
(Summary)

Anniversary of Zapolyarnyy

Exactly ten years ago, the first tents were pitched on this site in the Kola tundra. Now the city of Zapolyarnyy is celebrating its tenth anniversary. It population is now 10,000. The city is the location of the Zhdanovskiy Combine.

Sovetskaya Rossiya
5 June 1966
Page 6
(Summary)

New Equipment for Oil Extraction

Tyumen'. The industrial office of the "Yuganneft'" has designed a speical equipment which will maintain bed pressure and at the same time will improve the operational qualities of the wells. The most common source of water for this purpose is a nearby lake or river; the water is pumped into the productive layer under high pressure. The Yuganneft' office used the water from a neighboring exploratory well for the tests. This technique is being tried in Siberia for the first time.

Sovetskaya Rossiya
7 June 1966
Page 2
(Summary)

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We Struck Oil !!

The news of another oil well coming in overshadows even the greatest flood on the Ob' river. Although this oil district is relatively remote, it is readily accessible to the Ob' river and river transportation can deliver oil directly to the industrial bases.

Izvestiya
16 June 1966
Page 6
(Summary)

Explorers of Mute Mountains

Geologists and Geophysicists are taking advantage of the Polar summer to carry out extensive field work in the regions beyond Vorkuta and Inta.

Sovetskaya Rossiya
18 June 1966
Page 2
(Summary)

The Needs of a Transpolar City

Nar'yan-Mar, in addition to being the capital of the Nenetskiy National Okrug, is also a port on the Pechora river and a forepost on the polar tundra. A small brick factory with a capacity for 2.8 million standard bricks per year has been under construction here for nearly ten years now. The water mains are being laid to the plant for four years. The same is true of sewers, sanitary facilities, dwellings etc.

The main cause of all this inefficiency is seen to be the way in which direction of and responsibility for construction work are oriented. It is thought that placing the work under the direction of the Glavarkhangel'skstroy, a large contracting organization in Archangel, will solve the problem.

Stroitel'naya Gazeta
22 June 1966
Page 3
(Summary)

.../22..

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Document divulgué en vertu de la Loi sur l'accès à l'information

Toward the Petroleum Wealth of the Tyumen'

The settlement being built-up at the village of Parfenovo, near Tyumen', is still virtually unknown. It was non-existent a few months ago, but now it already boasts forty-two four-storey buildings. A hostel for 120 persons and a large store are being built. The wall-raising for a kindergarten and creche has been completed, and work on a club will soon begin. A Youth Brigade is building new dwellings. At the moment, it is at work plastering the new dining hall. This particular brigade is composed of 21 girls from various parts of the Soviet Union. They are a part of the work Train No. 237, which is engaged in the construction of the rail line Tyumen'-Tobolsk-Surgut.

The rail line from Tyumen' to Surgut will pass through the Tyumen' Oblast', the Khanty-Mansiyskiy National Okrug, and will connect the Surgut rayon oil and gas fields with the Trans-Siberian Trunk Railroad. This rail line must cross a dozen rivers, including the Tura, Tavda and the Irtysh.

Presently, work is going forward on the 215 km. section from Tyumen' to Tobolsk. Traffic is expected to move on this section next year.

The line from Tavda to Sotnik is also under construction. Its purpose is hauling of timber along the Tavda and Konda rivers. The line will be 186 km long and will be completed in 1968.

The rail line from Ivdel' to Ob' is under construction. It is 372 km. long and starts at Pershino station on the Sverdlovsk line, running northwest towards the Ob' river. The 220 km sector from Ivdel' to Konda is expected to be open to regular traffic this year. The entire line will be open to traffic in 1968.

Gudok
25 June, 1966
Page 2
(Summary)

.../23..

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In the Land of the Unsetting Sun

The nights are bright beyond the 60th parallel and morning is determined by the clock. At the point where the 60th parallel cuts across the Irtysh river, on the right "untamed" bank, the oil prospectors settlement of Gornopravdinsk is being built. In two years, the settlement population has grown to three thousand persons. The oil prospectors are hurrying to take advantage of the Ust'-Balyk to Omsk pipeline, which will pass near here, since they will be able to connect their wells into it.

Pravda
28 June 1966
Page 1
(Summary)

Electrification in the Taiga

A new power transmission line is being erected from Severoural'sk to Ivdel'. It will supply power to logging and woodworking enterprises and to the manganese mine.

The high-voltage line will follow the railroad from Ivdel' to the Ob' as far as the station at Atym'ya. The settlements and timber collectives that have grown up in the taiga wilderness during the past three years will receive power this year.

Stroitel'naya Gazeta
1 July 1966
Page 3
(Full Text)

Construction Projects in the North

Northern settlements are changing in appearance. New housing developments with covered passageways will be built in the near future. Construction of one such development which will house 8,000 inhabitants has been authorized by the Anadyr town executive committee.

Trud
16 July 1966
Page 1 (Full text)

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Natural Gas of the Tyumen' Oblast'

The Council of Ministers USSR has issued a directive to intensify geological exploration work for gas and for the development of important gas deposits in the north of the Tyumen' Oblast'. The Government attackes a particular importance to the establishment of a large gas producing area for the supply of this fuel to the European USSR and to the Urals.

The Ministry of Geology USSR and the Ministry of the Gas Industry have been instructed to prepare a written statement on the subject of exnloration and production of natural gas in the north of the Tyumen' Oblast' for the period 1966 - 1975.

This statement is to include the following:

(a) Measures for the production of gas by 1975 in quantities not less than 110-120 billion cubic metres.

(b) Construction of a pipeline system to deliver gas to the areas of the Centre, West and North West.

(c) Establishment of building materials supply bases and construction facilities.

The Ministry of Gas Industry has been directed to accelerate the development of newly discovered gas deposit areas in the north of the Tyumen' Oblast' and to organize the production of gas to reach 26-30 billion cubic metres by 1970.

The directive prescribes the development and manufacture of tools and instruments including specialized equipment capable of operating at low temperatures (up to - 65°C).

Izvestiya
17 July 1966
Page 2 (Full text)

.../25..

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Black Gold

The oilfields around Surgut are being developed at an accelerated pace. Through fire and water, snow and mud, the oilmen continue their search for the black gold beneath the earth. The Irtysh and Ob' rivers supply the booming oil industry through the Port of Surgut.

Vodnyy Transport
19 July, 1966
Page 3
(Summary)

Mineral Storehouse

Magadan. The Chukotskiy National Okrug has completed its first quarter-century of mining. Thirteen enterprises in this distant peninsula are supplying gold, tin and wolfram to the nation.

Power lines and vehicular roads dissect the endless tundra. The nation's most northerly electric power grid, running from Pevek to Bilibino, has been commissioned. Power now flows from the Arctic Ocean to the center of the largest gold-mining district in the Chukotka.

Sovetskaya Rossiya
21 July 1966
Page 4
(Full text)

City Changing Shape

The construction of nine-storey buildings has begun in the city of Archangel. They are being built in the workers' district of Kuznechikh, where dozens of multi-storey buildings have already been erected.

The new railroad station is nearing completion. A new combined sea and river transport terminal has been started on the bank of the Northern Dvina. The tallest building in Archangel will be the twelve-storey administrative building of the Northern Sea Steamship line.

Sovetskaya Rossiya
29 July 1966
Page 1
(Summary)

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What will Anadyr' be Like in the Future?

The residents of this town were given a preview of their city in the future. Plans include the construction of a micro-rayon wherein all the necessary amenities will be available under one roof.

Sovetskaya Rossiya
31 July 1966
Page 4
(Summary)

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PIPELINES

Progress of the Ust'Balyk-Omsk Pipeline

The Ust'Balyk-Omsk pipeline which will cross Siberia from north to south (1000 kilometres) will supply oil to the Omsk refineries and to the trans-Siberian pipelines. The first 90 kilometres of the pipeline are ready for insulation and laying work. Pipes of 1 metre in diameter are used for this project.

Gudok
8 April 1966
Page 3 (Full text)

Gaslines in the Tyumen' Oblast'

Vast quantities of natural gas have been discovered in the following locations of the Tyumen' Oblast':

(a) Eastern slope of the Ural mountains.

(b) The Berezovo group of deposits.

(c) Taz and Pur river basins.

(d) The Yamal peninsula.

The gasline Punga-Serov (500 kilometres) was built in less than 2 years.

Several gaslines are to be built simultaneously during the five year period. One of these, from Purpey to Ural of 1,500 kilometres will be designed by the YuzhNIIGiprogaz institute.

The plans will be completed this summer and construction will be started in 1967.

Sovetskaya Rossiya
12 April 1966
Page 4 (Extracts)

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The Gasline West Siberia Centre

The West Siberia-Centre gasline to be built as one of the Five-year Plan projects will follow the route Obskaya Guba-Salekhard-Ukhta-Kotlas-Cherepovets-Tikhvin and Leningrad. The Giprospetsgas Institute will be responsible for working out the plans for this project. V.I. Shpakovskiy, Deputy Chief Engineer of the institute, gave the following details:

The inexpensive fuel, discovered in the area of the Obskaya Guba will be supplied for the industrial needs of the north-west and partially to Belorussia. Archangel will also be supplied with this gas.

The pipeline of a total length in excess of 3,000 kilometres will cross the permafrost zone. Railways, highways and towns will be built in this zone which will be provided with an important building industry.

This pipeline will be built of extra large pipes ranging from 1,200 millimetres to 1400 milimetres. Compressor stations will have to be provided with units of 10,000 kilowatts.

The first phase of this project will be completed by the end of the five year period. This will allow a yearly additional supply of gas to the north west amounting to 10 billion cubic metres. The second phase which will be completed in 1973 will bring the total capacity of the pipeline to 50 billion cubic metres per year. Eventually this pipeline will be linked with the pipelines Bukhara-Ural and Central Asia-Centre to form a single circular system.

Trud
9 April 1966
Page 5 (Full text)

.../29..

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TIMBER AND FORESTRY

Forestry Detachments

Two exploration parties of the Tomsk aerial photo forestry survey expedition are now working along the banks of the Tym river, where new logging and timber products industries will be organized. They are making estimates of the timber reserves and are exploring the uninhabited taiga, as well as preparing preliminary plans for the operation of forestry economies ten years hence.

Izvestiya
27 July, 1966
Page 1
(Summary)

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TRANSPORT AIR

Mica Mining in the Mama Area

Mica mined at the settlement Mama in Siberia, is moved out with the help of helicopters. The latter usually land in the vicinity of mining sites and, transport crates of mica to the Mama airport where they are transferred to AN-12 aircraft. Pilots of the East-Siberian Air Directorate follow a firmly established flight schedule.

The entire air route linking Mama with other airports is fully equipped with radio facilities. A photo shows a control radio beacon which had also been delivered by helicopter.

Grazhdanskaya Aviatsiya
No. 5, 1966, page 24
(Extracts)

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Document disclosed under the Access to Information Act
Document divulgué en vertu de la Loi sur l'accès à l'information

TRANSPORT RAIL

The Railway Line Archangel-Leshukonskoye

A labour force of 2000 workers is employed on the construction of the railway line Archangel-Leshukonskoye. Rails are now extending to a distance of 40 kilometres to the east of Archangel. The first stage of this line (195 kilometres) will be completed in the course of the Five-year Plan.

Gudok
10 April 1966
Page 1 (Extract)

Railway and Pipeline Construction in Tyumen'

The first oil pipeline in Western-Siberia from Shaim to Tyumen' was completed in 1965. The second pipeline from Ust'-Balyk to Omsk was started in that same year. This latter pipeline will reach the village Demyanskoye by the start of the navigation season.

Until three weeks ago, pipes were brought to Demyanskoye by road. As roads became difficult, AN-12 aircraft were called to the rescue. This represents only a temporary solution to the problem. The successful development of oil and gas deposits requires rail transport facilities. Railways are being built. The lines Tavda-Sotnik and Ivdel'-Ob' will soon be in operation.

The Resolutions of the XXIII Party Congress direct further construction on the line Tyumen'-Tobol'sk-Surgut (650 kilometres).

Stroitel'naya Gazeta
15 April 1966
Page 1 (Extracts)

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Thoughts on a Plan

It is pointed out that the need for suitable accommodation for settlers and workers along the new rail line from Tyumen' to Surgut is being overlooked. All too frequently, dwellings for railway workers are built on the margins of swamps, remote from other habitation. It is emphasized that excellent accommodation is an important factor in inducing people to settle permanently in these areas. It is also pointed out that the temporary vehicular road being built for the purpose of hauling ballast to the new railway line should be made into a permanent road for the convenience of settlers.

Gudok
9 June 1966
Page 3
(Summary)

Through the Taiga

The Northern Urals has become a land of new construction. A railroad artery stretches from Ivdel' to the Ob' river for a distance over 340 km. A second line runs from Tavda to the taiga settlement of Sotnik. The first gas pipeline frim Igrim to Serov is now in operation. A high voltage transmission line is now being erected from Ivdel' to Severoural'sk. It will pass through the very heart of the bauxite deposits.

Izvestiya
23 June 1966
Page 6
(Summary)

Conquering the Irtysh River

Bridge-building collectives are battling the forces of nature in their efforts to span the Irtysh river with a bridge on the Tyumen'-Surgut railroad trunk line now under construction.

Sovetskaya Rossiya
23 June 1966
Page 1
(Summary)

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Document disclosed under the Access to Information Act
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The 370 Kilometer Mark

The insignificant siding at Pershino, near Ivdel', was suddenly converted in 1959. It became the starting point for the Ivdel' Ob' rail line.

Presently, the construction crews have reached the 350 km mark on their way to the Ob'. Twenty kilometers more is all that remains to the last spike at the 370 km mark on the Ob'.

Stroitel'naya Gazeta
29 June 1966
Page 4
(Summary)

The Railway Line Reshoty - Boguchany

A party of students from various Irkutsk institutes has been sent for summer work on the railway line Reshoty-Boguchany. This line will cross the Kezhemskiye marshes, the Shitkinskiye forests and will emerge at the future Boguchanskaya hydro-power station in the lower reaches of the Angara. The railway builders will have to cover a distance of 320 kilometres.

Stroitel'naya Gazeta
15 July 1966, page 3
(Full text)

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Document disclosed under the Access to Information Act
Document divulgué en vertu de la Loi sur l'accès à l'information

TRANSPORT ROAD

Vehicle Tests in the North

Three ZIL-130 vehicles specially built for the North and ten test drivers were despatched from Moscow to carry out trials in the Yakut ASSR. The vehicles were transported by rail to the station Bolshoy Never from where they were driven to Yakutsk.

At the time when the three above mentioned vehicles left Yakutsk for Oymyakon (the Pole of Cold), two additonal ZIL vehicles were despatched from Moscow aboard AN-12 aircraft. Thus all five vehicles were undergoing northern trials. Some were used in the Verkhoyansk area, others made trips between Ust'-Nera and Magadan.

One of the ZIL-130 S was returned to Moscow for modification.

Recently, GAZ-53 S vehicles also completed northern trials having travelled along northern routes a total distance equal to that from Yakutsk to Moscow and return.

Vehicles built in Ulyanovsk and Minsk had been successfully tested in northern conditions.

Izvestiya
19 April 1966
Page 6 (Extracts)

Aero-Sled Amphibians

The photo shows a postal aero-sled in operation over slush ice in the north. This amazing craft, designed and built by the design office headed by A. N. Tupolev, makes regular trips at any time of the year and in any kind of weather. In winter, it achieves 100 km per hour over soft snow, it can operate over thin, unsound ice and open water. The aero-sled amphibians make scheduled postal deliveries to coastal populated points.

Izvestiya
4 June 1966
Page 6
(Full text)

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First Deliveries

Ust'-Ilimsk. Work has been completed on the 250 km long vehicular road from Bratsk to Nevon. The first column of heavy cargo trucks delivered materials and foodstuff to the builders of the Ust'-Ilimsk hydroelectric power station.

Stroitel'naya Gazeta
24 June 1966
Page 2
(Full text)

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TRANSPORT WATER

The Role of River Transport in the Development of Freight Shipments in the Tyumen' Oblast'

The problem of development of the natural resources of the Tyumen' Oblast' yearly acquires greater importance to the national economy. This territory has great reserves of oil and gas, as well as peat, brown coal, and ferrous and non-ferrous metal ores. There are also extensive timber reserves.

The estimated oil reserves in the Tyumen' Oblast' amount to tens of billions of tons, the reserve of natural gas is estimated at over 4 trillion cu m, while that of timber exceeds 4 billion cu m.

At least 20-25 million tons of oil will have to be transported from the Shaim, Ust'-Balyk and Megion oilfields by the end of the current Five-year Plan. About 16-26 billion cu m of gas from the Berezov-Igrim area will be sent to the Sverdlovsk, Perm' and other Oblasts.

Timber shipment by railroad, river and vehicular transport, with due account of the recapitulation of such shipments, will amount to 19 million tons in the next few years.

Besides shipment of oil, gas, and timber from the Tyumen' Oblast', this district will be supplied with an enormous amount of construction materials, petroleum products, various equipments, pipe, industrial goods and food-stuffs for the population and other freight.

The demand for building materials alone will exceed 10 million tons per year on the average, this is associated mainly with the start of construction on a number of large projects for the petroleum and timber industries, transport, and power generation.

River transport is of great importance in the shipment of various industrial and agricultural freights, since the other forms of transport (oil pipeline, rail, vehicular) are still very poorly developed on the territory of this Oblast', which has an area of over 1.4 million sq km.

Rail and vehicular roads are situated mainly in the southern part of the Oblast', whereas most of the oil and gas fields and timber cutting points are located in the central and northern parts.

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The Oblast' has one of the leading places in the country for length of operating water communication routes (over 13 thousand km). Freight shipments are made along the Ob' and Irtysh rivers and their tributaries the Tobol, Tura, Konda and other waterways.

The fleets of the Ob', Irtysh and Verkhne-Irtysh Steamship Lines haul about 6 million tons of various freights, of which over 70% is timber (including 60% in rafts), over distances averaging 1000 km.

About half the timber cut is shipped outside the Oblast'. The scale of timber freight shipments in the vicinity of the mounth of the Irtysh river on the Ob' amounts to 0.5 million tons and reaches one million tons farther north around Salekhard. The stream of timber originating on the Irtysh river and moving south comes to one million tons. At the mount of the Tobol, this stream of timber divides into two approximately equal parts, one of them goes along the Tobol and Tura to the city of Tyumen', the other continues along the Irtysh to the city of Omsk and farther upstream.

Towing of log rafts predominates on the Konda river. The scale of this operation amounts to 0.7 million tons at the settlement of Sotnik. The logs are taken out of the water at Vykatnoye and loaded onto ships. Rafts are also formed up here for towing towards Salekhard (Labytnangskaya Timber Transshipment Base).

River transport carries crude oil from the Shaim and Surgut areas to the oil refinery at Omsk via the Konda and Irtysh rivers and along the Ob' river th Novosibirsk. In 1965, the volume of such shipments reached 800 thousand tons.

Industrial goods and foodstuffs are brought in to the Tyumen' Oblast' mainly by direct mixed rail and water transport through the transshipment points at Tyumen', Omsk, Labytnangi, Novosibirsk and Tomsk. Equipment, machinery, and construction materials are also brought in by this method. The volume of such shipments in 1965 amounted to 1.5 million tons, of which 0.5 million tons (construction materials, cement, gravel, sand-gravel mixture, crushed rock) come from the Omsk, Pavlodar, Semipalatinsk, Tomsk, Novosibirsk and other Oblasts. Sand and some other construction materials are delivered from points in the Tyumen' Oblast' by intra-rayon means.

Up to 500 thousand tons of petroleum products are brought into the Tyumen' Oblast' by river transport.

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The development of freight shipment and its distribution among various types of transport will be vitally influenced by the new and planned transportation facilities.

At the present time railroads are being built from Ivdel' to Ob' (372 km), and Tavda to Sotnik (187 km), the oil pipeline from Shaim to Tyumen' (436 km) has been completed, the gas piepline from Igrim to Serov to Nizhniy Tagil (first line) is nearing completion, construction has begun on the railroad Tyumen'-Tobolsk - Surgut (710 km), an oil pipeline from Ust'-Balyk to Omsk (1036 km), plans have been made for the construction of a gas pipeline from Igrim to Serov to Nizhniy Tagil (second line) a vehicular road from Tyumen' to Tobolsk and others. Timber transhipment bases will be built in the near future at Sergino and Sotnik on the intersections of the railroads Ivdel'-Ob' and Tavda-Sotnik with the rivers Ob' and Konda.

New streams of freight will be developed, there will be changes in the flow of timber, petroleum and other freight on river routes, and freight shipments by combined routes will appear.

Estimates made by the Central Scientific-Experimental Economic Institute of the Gosplan RSFSR show that the volume of timber shipments by rail and river transport in the Tyumen' Oblast' (taking into account their recapitulation and intra-rayon shipments) will amount to about 12 million tons per year within the next four or five years; of these, railroads will carry 7 million tons and river transport 5 million. Over 7.5 million tons of timber will be moved by truck transport from the logging areas to the rail and river routes.

In the near future it is planned to haul about 3 million tons of timber freight yearly from the Tyumen' Oblast' in a westward direction along the line from Ivdel' to Ob'. Such freight will come from the Upper Konda and other timber cutting regions along the railroad.

Shipment of timber freight long the railroad from Tavda to Sotnik will reach 1.2 million tons at the approaches to Tavda due to timber cutting in the Kondinskiy and Tavdinskiy rayons.

As a result, more than 4 million tons of timber will come to the European part of the country by the shortest route along the rail lines from Ivdel' to Ob' and Tavda to Sotnik. The scale of these shipments will amount to more than 5 million tons along the line from Surgut to Tobolsk to Tyumen'.

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A description of the prospects for timber movement by river transport should mention that, when transhipment points at Sergino and in the vicinity of Sotnik are organized, timber cut in the Nizhne-Ob' and Kondinskiy rayons will be brought to these points and then transshipped from river transport to the railroads Ivdel' - Ob' and Tavda - Sotnik. The transhipped volumes will be about 1 million and 0.7 million tons respectively.

Transshipment to railroad transport in the vicinity of Sotnik will shorten the distance of water hauls of timber (cut on the headwaters of the Konda river), which are made now through the Tyumen' along the Konda, Irtysh, Tobol and Tura rivers, by more than 1300 km. This will bring a saving in shipping costs of 2.1 roubles per ton and capital investment in the fleet amounting to 3 roubles per ton. At the present time shipments are being carried out along the Tura river under the most unfavorable conditons due to the short-term highwater period.

About 0.6 million tons of timber freight will be moved from the Nizhnne-Ob' logging region down the Ob' to Labytnangi for transshipment onto the railroad and further shipment to the Vorkutinskiy coal region.

In the near future, the Tyumen' will be supplied with timber from the Tobol'sk logging region; this supply will amount to 0.5 million tons and an equal amount will be supplied to the Kazakh SSR.

A significant amount of timber will be transported to meet the requirements of the Surgutskiy, Salekhard and Tazovskiy rayons of the Tyumen' Oblast'.

Because the oil artery from Ust'-balyk to Omsk will not be in operation before 1968, the crude oil from the Ust'-Balyk and Megion areas (2.5-3 million tons per year) destined for Omsk and party for Novosibirsk will be carried exclusively by river transport along the Ob' and Irtysh, and shipments will increase by three or four fold in comparison with 1965.

In the event that the oil pipeline Ust'-Balyk to Omsk reaches Demyanskiy by the end of 1966, then at the start of the navigation season it will be possible to organize shipment of crude oil by the combined pipeline-river system (by pipeline to Demyanskiy and onward by river boat to Omsk along the Irtysh). This will allow a reduction in shipping distance of 650 km and a saving in operational costs of 1.27 roubles per ton.

After completion of this pipeline, crude oil will be transported from Megion and other points in the Tyumen' Oblast' along the Ob' river towards Novosibirsk.

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The volume of construction materials carried by river transport will be significantly increased and will amount to, as an example, about 8 million tons in the busiest year, 1968. The ratio of these materials in the total volume of shipments by various types of transportation will amount to more than 50%.

The rayons requiring construction materials will be as follows: Surgutskiy (42%), Tyumenskiy (38%), Shaimskiy (9.1%), Berezovskiy (8.9%) and Tazovskiy (2%).

In view of the limited possibilities for providing the branches of industry with local building materials, the bulk of such materials will have to be supplied from other Oblasts. Most of this freight is expected to be shipped by the mixed rail-water system wherever river transport is the main communications link between supplier and consumer.

Delivery of construction materials to the Surgutskiy rayon will be made as follows: from the Sverdlovsk and Chelyabinsk Oblasts by railroad to Tyumen, Omsk, Sergino and Tobol'sk, then by river boat (structural reinforced concrete, cement, high-strength ballast, etc., up to 1 mill. tons in all); from the Novosibersk Oblast' along the Ob' by river boat, partly by transshipment at Novosibirsk Port, and partly by shipment from the docks at the Iskitim cement plant (cement, structural reinforced concrete, ballast, totalling 0.6 mill. tons); from the Tomsk Oblast' along the Tom' and Ob' rivers (gravel and gravel sand mixture from river beds totallling 1.8 mill. tons); from the Semipalatinsk and Pavlodar Oblasts of the Kazakh SSR (gravel totalling 0.2 mill. tons); from the Tyumen' Oblast' by river transport on inter-rayon communication lines (sand, wall materials totalling 2 mill. tons).

It is proposed to deliver ballast, rubble stone, and structural reinforced concrete mainly from the Sverdlovsk Oblast' to the Shaimskiy rayon by railroad as far as Sotnik with partial stranshipment to river transport for delivery to consumers along the Konda river. The planned volume of these shipments is about 1 million tons. It is intended to transport sand and wall materials from the Tyumen' Oblast'.

Delivery of construction materials will be made from the Sverdlovsk Oblast' by railroad to the Berezovskiy rayon (cement, structural reinforced concrete, ballast, wall materials) with partial transshipment at Sergino of up to 1 million tons.

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The Tazovskiy rayon will be supplied with building materials from the Northern and Central Urals via railroad through Labytnangi. In addition, it is planned to bring in to this raion up to 100 thousand tons of rubble stone from the Podgorinskiy crushing-grading plant.

Freight deliveries to the Tazovskaya and Obskaya Gubas will continually increase, since the scope of geological reconnaissance and drilling operations is steadily growing in these regions. The scale of shipments of construction materials, equipment, machinery, industrial goods and foodstuffs to these regions will reach 250 to 300 thousand tons in the next few years.

Provision of petroleum products to all branches of the national economy is intended to be carried out from the Chelyabinsk Oblast' and Omsk. The volume of water shipments will be nearly doubled (up to 0.8 - 1 million tons).

It is planned to deliver equipment, pipes, rolled metal, and machinery to the Tyumen' Oblast' by the mixed rail-water system from the west through the points of Tyumen', Omsk, Labytnangi, Tobol'sk, and Sergino; from the east through Tomsk and Novosibirsk. The volume of these freight shipments should come to more than 1 million tons in the next few years.

An important task for river transport is the supply of foodstuffs and industrial consumer goods to the population in the Oblast', the volume of such shipments should increase by 2 or 2.5 times.

Research has shown that the volume of shipments and freight turnover in the Tyumen' Oblast', to be handled by river transport, will increase by several fold in the next few years.

The significant increase in transportation operations will require maximum utilization of river transport capacity, disclosure of reserves, and a considerable improvement in the participation by clientele, as well as an immediate expansion of transportation facilities (port and dock economy, fleet etc.).

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An important reserve for river transport is the elimination of unproductive delays in loading and unloading ships at clients' docks. These delays in the timber and petroleum industries alone during 1965 amounted to more than 3.3 million tonnage-days, which equals the idle time of 20 one-thousand-ton ships for the entire navigation season. This lowers the productivity of the fleet in the basin by 160 ton-kilometers. Characteristically, during the initial period of navigation 30 - 40 ships stood idle in the ports and roadsteads while there was a general shortage of tonnage.

The long lay-over of ships in the depths of the Tyumen' Oblast' is partially accounted for by the fact that the petroleum and timber industry organizations did not make adquate preparations for shipping operations. The plans for construction and commissioning of moorings and freight-handling areas at the petroleum industry sites was only half completed. Many of the docks did not have vehicular approach roads and mechanical equipment, and the majority of them were flooded during the spring highwater period. Freight-handling operations on the docks and areas were hampered by lack of lighting and work was carried on during 1.5 or 2 shifts, instead of 3 shifts.

An important task is the reconstruction and construction in the Ob'-Irtysh Basin of such ports and wharves as those at Omsk, Tomsk, Tyumen', and Surgut; moorings at Nefteyugansk, Megion, Nizhnevartovskiy, Uray, Sotnik, Sergino, Labytnangi, Tazovsk and other points, these ports must also be equipped with large capacity mechanical equipment, and vehicular and rail approach roads must be built.

The time is now ripe for the construction of the port at Tobol'sk, the freight turnover here may reach 2 million tons when the Tyumen'-Surgut railroad comes into the Tobol'sk area. The greatest part of this freight will be mineral construction materials and various equipment. Such freight will be shipped by the mixed system with transshipment from rail to water transport, while the return trip (from water to rail) will be utilized for shipment of timber and other freight.

The construction of the port at Tobol'sk will make it possible to redistribute operations among the transhipping ports in the Ob'-Irtysh Basin, ie, to relieve the Omsk port of transshipping operations coming from the west, and also the port at Tyumen', which is very congested at the present time.

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The increase in flow of river freight in the regions around the Obsko-Tazovskaya Guba, with its short (1 - 2 months) navigation season, under nearly maritime (particularly wave and wind regime) conditions for sailing makes it necessary to build mechanized freight-handling moorings (with special approaches to them) on the Yamal Peninsula coast and along the Pur and Taz rivers. The lack of such facilities makes it extremely difficult to organize shipments to remote northern regions.

The inability of ships to come up the shore because of shallow water conditions makes it necessary to off-load them at roadsteads by means of auxiliary craft and then again, mainly by hand, at the shore in the Obsko-Tazovskaya Guba regions.

Because of the increase in river freight shipments on the Oblast' territory it will be necessary to augment the fleet and change its composition.

The self-propelled freighter fleet in the Ob'-Irtysh Basin consists mainly of merchant diesels of small and medium capacity (up to 1000 tons) and tankers, as well as a large number of boats with capacity of up to 100 tons. The tug fleet consists mainly of low powered ships. The main types of craft in the towed freighter fleet are metal and composition lighters of up to 1000 tons capacity and metal barges (tankers and dry freight) carrying from 40-60 tons up to 2000 tons.

The Ob'-Irtysh Basin must be provided with large tonnage self-propelled ships and barges, as well as with powerful tugs.

All these measures will enable the Irtysh and Ob' Steamship Lines to successfully carry out their role in the development of the natural resources of the Tyumen' Oblast'. The author of this article was: N. Tsurkov, Candidate for the technical sciences: and V. Ivanov, Candidate of the Economic Sciences.

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Soviet Wheat for Less Developed Countries

4. According to reports the Soviet Union is making wheat available to some of the less developed countries. India has announced that it will receive a gift of 200,000 tons from the USSR and sales of 250,000 tons and 200,000 tons are reported to have been made to the UAR and Algeria respectively. (CONFIDENTIAL)

MIDDLE EAST

UAR

Soviet Constructed and Equipped Pharmaceutical Plant in the UAR Reported to be a Failure

5. According to a US report the UAR Health Ministry is experiencing difficulty operating a pharmaceutical plant built by the Soviet Union at considerable expense to the UAR. The UAR Health Ministry recently requested the services of a technician from an American pharmaceutical firm to look at the penicillin and streptomycin operations and to make recommendations for improving the operation. The equipment operating in the plant is said to be outmoded and the various components of the processes are poorly balanced. In addition, the general housekeeping and maintenance procedures are not up to standard and the penicillin strain in use is not a particularly productive one. (CONFIDENTIAL)

Polish Aid for an Aluminum Plant

6. The UAR and Poland have concluded an agreement for the construction of an aluminum plant near Aswan. The project is expected to cost about $35 million and will be the first plant to use Aswan High Dam electric power.

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The plant will have an estimated annual output of about 40,000 tons.

7. Under the agreement Poland is providing a credit valued at about $19 million, for equipment, engineering services and spare parts. The loan to the UAR will be repaid in ten annual installments in the form of surplus aluminum production. (RESTRICTED)

Jordan's Economic Relations with the Soviet Union

8. The Soviet Union displayed considerable interest in Jordan's economic development in 1966 and in November was awarded a contract valued at $1.7 million for the supply and installation of penstocks and gate valves for Jordan's Khaled Dam project. This is the first contract to be concluded between the two countries and apparently has encouraged the Soviet Union to try to increase its economic activity in Jordan. In this respect there are indications that the Soviet Union intends to submit bids on other tenders for the Khaled Dam including the construction of a water storage basin, the hydroelectric power system and the relocation of a railroad in the dam areas. There are also indications that the Soviet Union is prepared to offer Jordan a credit valued at $2.8 million for the construction of a new airport at Amman. (SECRET)

9. According to a statement made by a Soviet official of Tekhnopromeksport fifty Soviet technicians are to arrive in Jordan in mid-1967 to work on the Khaled Dam project. (SECRET)

Syria

Soviet Aid for Syria's Railroads

10. According to press reports from Syria, Soviet assistance to Syria's railroad system has recently been increased. A Soviet study of the much discussed direct rail link between Damascus and Homs has begun and studies concerning the modernization of the existing Homs-Aleppo line are also underway. Syria is also negotiating with Hungary for the supply of ten new locomotives.

11. The aid being utilized for these activities in Syria is likely being drawn from a $100 million Soviet credit extended to Syria in 1957.

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12. A Soviet delegation recently visited Syria to review studies on and to assist in the completion of an electric power line between Aleppo and Taba, the site of the proposed Euphrates Dam, and work has begun on a Soviet-Czechoslovak-Italian nitrogen fertilizer plant in Homs. (UNCLASSIFIED)

Algeria

France Cancels Some of Algeria's Debt

13. According to recent reports France has agreed in principle to cancel $200 million of Algeria's pre-independence public debts. France has been holding back on its 1966 aid commitment to Algeria and has made available only about $5 million of $24 million in promised grants. (UNCLASSIFIED)

Soviet Wheat for Algeria

14. The Soviet Union has agreed to provide Algiera with 200,000 tons of wheat by the end of 1967. The sale is strictly a commerical transaction under the terms of the current trade agreement. (UNCLASSIFIED)

Congo (Brazzaville)

Chinese Aid to Congo (Brazzaville)

15. During November, 1966 President Massemba-Debat laid the cornerstone of a textile complex being constructed near Brazzaville under a Chinese credit. The complex will include a spinning mill, a cotton mill and a printing and dye works. Production is expected to start in November, 1968.

16. Congo (Brazzaville) has received an estimated $25 million in economic aid from Communist China of which an estimated $5 million has been drawn. (CONFIDENTIAL)

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Ethiopia

Soviet Constructed Oil Refinery Completed

17. A Soviet constructed oil refinery at Assab has started refining crude oil with full production expected to begin in February, 1967. The cost of the refinery is estimated at about $14 million of which $11 million is being financed under a long-term Soviet loan valued at $100 million extended to Ethiopia in July 1960. Although a contract for the refinery was signed in 1962 actual work on the project did not start until early 1963.

18. An estimated 500 Soviet engineers and technicians were employed at the site of the refinery in mid-1966. (SECRET)

Guinea

Communist China Extends Additional Aid to Guinea

19. Under a new aid agreement, concluded in Peking during a visit by the Guinean Minister for Economic Development, Communist China has extended Guinea $28 million in new credits including $22 million in a long-term interest-free loan to finance new development projects and the balance of $6 million to be used to cover Guinea's trade debt with China. Projects scheduled under the new loan include a hydroelectric power station, road construction and a small irrigation project. Almost all of a previous Chinese credit for $25 million has been obligated for specific projects.

2. In addition to the new development loan China reportedly has agreed to provide Guinea with 25,000 tons of rice, 10,000 tons of sugar and a shipment of wheat as well as medical supplies. Previously Guinea's basic food imports had been largely supplied by the US under PL-480 agreements which Guinea now appears resolved not to renew. (CONFIDENTIAL)

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Somalia

Aid Requested from The International Development Agency (IDA)

22. Somalia has requested aid from the International Development Agency (IDA) for the construction of a deep water harbour at Mogadishu. (UNCLASSIFIED)

Sudan

Communist China Extends Economic Aid to Sudan

23. A Sudanese newspaper has announced that Communist China has agreed to loan Sudan up to about $5 million (US) for the reconstruction of a spinning and weaving mill. According to the report details of the Chinese loan were discussed with the Sudanese government officials during a visit to Peking last April. (UNCLASSIFIED)

24. This is the first Chinese loan to the Sudan. Previous communist aid to Sudan is valued at $33 million, including $23 million from the Soviet Union and $10 million from the East European communist countries. (CONFIDENTIAL)

Zambia

Soviet Economic Delegation Visits Zambia

25. In response to an invitation from the Zambian Government a Soviet economic delegation recently spent two weeks in Lusaka studying projects under Zambia's fourth-year plan. As a result of the Soviet visit a technical agreement between the two countries may be forth-coming in the near future. (CONFIDENTIAL)

26. A Zambian mission, led by Vice President Kamanga, visited the Soviet Union and Communist China recently and during the visit to China received an offer of aid, but apparently no firm agreement has been concluded. (CONFIDENTIAL)

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To make better use of the River Fleet in Western Siberia

The directives for the Five-year Plan put out by the CPSU at its XXlll Congress placed heavy stress on the development of the natural resources of the West Siberian Plain.

Because river transport plays a large role in the economy of the Omsk and Tyumen' Oblasts, a number of the government's most important resolutions have been acted upon for the purpose of strengthening the material-technical base in the Irtysh Basin. The Omsk Oblast' Party organization is directing the activities of Party, economic, union, and komsomol organizations of the Irtysh Steamship Line and the Basin Waterways Administration in carrying out their tasks of servicing industry, the rural economy and the population in th extensive regions bordering on the rivers.

During the Seven year Plan, the Irtysh Basin received a considerable number of more modern ships, large scale work on modernizing the existing fleet was carried out, plants and ports were equipped with large capacity equipment. The productive capacity of enterprises has been expanded, the port at Omsk has been built and also one of the most beautiful river passenger terminals in Siberia hs been built at Omsk.

Effective measures have been implemented for expanding the transportation economy, provision of living accomodation for river transport workers, work discipline in the fleet, ports and enterprises has been improved and crews have been reinforced.

All these steps made it possible to increase steamer freight turnover by 2.2 times in 1965 in comparison with 1958. This increase included a 13-fold increase in petroleum product shipments, and extension of serviced watereays to 14 thousand km.

The Irtysh rivermen organized and skillfully mastered the new art of transporting oil. In two navigation season, the Omsk oil refinery received about 1 million tons of oil from the re-opened oilfields in the Tyumen' Oblast'. During the preparationand completion of this important State task the Omsk Oblast' committee of the CPSU solved urgen organizational problems associated with strengthening Party influence on the work of collectives in the fleet, ports, on the docks, at ship repair stations, and the operational sectors of the routes.

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Tanzania

Chinese Aid being Implemented

27. Communist China is assisting Tanzania in a project to construct a $5 million dam at Kidunda, on the Ruvu River, to store water for irrigation and to generate electricity. Six Chinese technicians are currently employed on the site and more are expected in the near future. (UNCLASSIFIED)

28. Tanzania's new short-wave broadcasting transmitter, provided by Communist China at a cost of over $500,000, was officially opened in Dar es Salaam a short time ago. China donated half of the cost of the transmitter as a gift and the balance is in the form of an interest-free loan. (UNCLASSIFIED)

ASIA

India

The Aid India Consortium

29. The Aid India Consortium recently met in Paris. No new decisions on assistance to India were taken after a general review of India's economic situation. Member nations are expected to meet early in 1967 to consider a report on the Indian situation from the World Bank and to decide the amount of direct project aid they are prepared to offer India for its Fourth Five-Year Plan. Under the Third Plan India received about $1,100 million annually from the consortium and hoped to receive a western contribution of $1,600 million annually for the Fourth Plan. Consortium members have already agreed to provide $900 million in non-project aid this year but the amount of non-project aid for 1967-1968 has not yet been decided. (UNCLASSIFIED)

India

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India

Soviet Union to Provide Assistance for the

Construction of the Bokaro Steel Plant

30. An India delegation, led by the managing director of the Bokaro steel plant, visited Moscow in December to discuss the various stages of the construction schedule of the Bokaro plant which is being built with Soviet assistance. Agreement was reached on the supply of equipment from the Soviet Union with the first blast furnace to begin operating by the end of 1969, together with the coke ovens. The first stage of the plant is to be completed within India's Fourth Five Year Plan. (UNCLASSIFIED)

31. About 30 Soviet technicians are now employed at Bokaro but the number of Soviet technicians employed on the project is expected to reach 250 before the end of 1967. (UNCLASSIFIED)

32. The Soviet Union is reported to be providing India with technical aid for the construction of a new steel works near Madras. The output of the new plant is set at 50,000 tons to be increased over a period to a total of 200,000 tons. (RESTRICTED)

Nepal

Communist China Extends Economic Aid

33. It was officially announced on 21 December that Communist China had extended Nepal a grant valued at $20 million, including $2 million in convertible currency, $3.6 million in commodities to be sold on local Nepalese markets to generate local currency and the remainder to finance development projects. The new aid was agreed upon in July, 1966 but was not formalized until recently. Previous Chinese aid commitments to Nepal in 1956, 1960 and 1961 are valued at about $42 million of which only $13 million has been drawn with most of it being utilized for road construction. (SECRET)

34. There is no evidence that the new aid has been obligated for specific projects but a large portion of it is expected to be used for the construction of the Katmandu-Pokhara road in 1967. (SECRET)

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Pakistan

Communist China Provides Pakistan with Food Grains

35. According to news report from Karachi, Communist China will provide Pakistan with about 150,000 tons of food grain within the next few months. Pakistan will pay for the grain out of the unexpended portion of a $60 million loan extended by Communist China. (UNCLASSIFIED)

SOUTH AMERICA

Chile

Soviet Union Expected to Conclude Trade

and Aid Agreement with Chile

36. A recent report indicates that trade and aid agreements between Chile and the Soviet Union will be concluded soon. The trade agreement is likely to run over a period of two years and will provide for the export of Chilean copper and copper manufacturers to the USSR. Soviet aid to Chile under the aid agreement will amount to about $60 million over a period of several years at 3 per cent interest. (CONFIDENTIAL)

37. Negotiations concerning expansion of Chilean-Soviet economic relations have been underway for some time and were only concluded when the Soviet Union dropped its insistence on tying payments to gold. (CONFIDENTIAL)

Columbia

Soviet Commercial Mission Visits Bogota

38. A Soviet commercial delegation is expected to visit Bogota soon for the purpose of establishing commercial relations with the Columbian Government. This is the first Soviet mission to visit Columbia since Columbia severed relations with the USSR in 1948. (UNCLASSIFIED)

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Dominican Republic

Czech Trade Mission Visits Dominican Republic

39. In November 1966 a Czech trade mission visited the Dominican Republic and offered to sell complete industrial plants such as sugar mills and automobile assembly equipment. The delegation also expressed interest in purchasing Dominican cacao and coffee. (UNCLASSIFIED)

40. The Dominicans are reported to have indicated some interest in increasing sales of agricultural products to Czechoslovakia. (UNCLASSIFIED)

PART 11: MILITARY AID

MIDDLE EAST

Cyprus

Shipment of Czech Arms

41. A small shipment of Czech weapons was delivered to Cyprus by sea in late November. The shipment, consisting of automatic weapons, rifles, anti-tank grenade launchers, mortars, and ammunition, and reportedly weighing 150 tons, is valued at just over $500,000 (US) and was purchased by the Cypriot government for the Cypriot police force. Negotiations for the deal are said to have begun last August and the total value of the purchase is estimated at about $840,000 (US). Because of the international repercussions resulting from the arrival of the arms, a second shipment, of 20 armoured cars, was not delivered and was subsequently cancelled by the Czech government, and the weapons which did arrive have not yet been issued to the Cypriot police. It appeared at last report that these weapons were still under the control of the Cypriot government. (SECRET)

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UAR

New Soviet Equipment

42. The latest count on the number of SU-7/FITTER strike aircraft deliveried to the UAR is 34, out of an order for possibly 80 of these aircraft. Six more OSA class guided missile patrol boats were delivered in December bringing the total received to ten, which is believed to be the number ordered. The UAR is the first non-Communist recipient of both of these items of equipment. (SECRET)

AFRICA

Algeria

Further Deliveries

43. Further large deliveries of Soviet military equipment were made to Algeria during December. At least four Soviet freighters brought arms cargoes during the month, bringing the total number of Soviet ships transporting military equipment to Algeria during 1966 to 28. Notable among the items delivered during December were two KOMAR class missile patrol boats and possibly as many as 38 SS-N-2/STYX cruise missiles, the weapon used by the KOMARs. Two KOMARs were also delivered in November, the first to be received by Algeria. A considerable number of military vehicles also arrived in the December shipments. (SECRET)

44. Deliveries to Algeria have occurred throughout 1966 with at least 28 Soviet ships bringing arms cargoes during the year. The amount of arms being supplied appears to be out of proportion to the country's needs and may be explained by considerations of national prestige. The USSR, for its part, has gained an important entrée into Algeria. (SECRET)

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Mali

Military Delegations to USSR, China and Algeria

45. A recently received British report covering the month of November 1966 stated that Malian military delegations had gone to both China and the USSR reportedly in search of further arms. It also stated that a mission had gone to Algeria to study the problem of the transit of military aid across the Sahara to Mali; a large shipment of Soviet military aid was transported across the desert in May 1966 by train and road after being delivered by sea to Oran. (SECRET)

ASIA

India

Interest in SU-7

46. It is reported that India is interested in obtaining SU-7/FITTER strike aircraft from the USSR and that an air force mission has visited there to evaluate the aircraft. The UAR is now receiving SU-7's and Iraq and possibly Syria have them on order. So far the only combat aircraft India has obtained from the Soviet Union is the MIG-21/FISHBED. (SECRET)

Ethiopia

Training in Poland

47. Four junior army officers are reported to have left for Poland recently to begin five to seven year studies in electronics, and 12 to 15 more have been designated to attend other technical courses for similar periods. This will mark the first occasion on which Ethiopian military personnel are to receive training in a Communist country and indeed will be the first Communist military assistance received by Ethiopia. (CONFIDENTIAL)

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Somalia

Military Deliveries

48. Soviet military aid deliveries to Somalia since July have consisted of relatively small scale shipments of vehicles, including mobile workshops, and miscellaneous items and spares but, so far as is known, no actual weapons. This indicates that deliveries under the 1963 military aid agreement with the USSR may be nearing completion. Technical and training assistance, however, continue. Somalia may have sought additional military aid when the Somali president, accompanied by some military personnel, visited the USSR in September. (SECRET)

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SECRET
CANUKUS EYES ONLY

JIB(CAN)35/66

Communist Economic Aid Extensions to Less Developed Countries

December 1966

Extended by	Recipient	Value (million US$)
Soviet Union	Iran	290.0*
	Pakistan	20.0
	Pakistan	84.0
	Syria	134.0
	Cameroun	7.7
	Burma	14.0
	Morocco	35.0
	Somalia	4.2
	Brazil	100.0
	India	630.0
		1,318.9
Czechoslovakia	Pakistan	28.0
Hungary	Syria	14.0
	India	52.5
		66.5
Bulgaria	Syria	15.0
	India	15.0
		30.0
Communist China	Tanzania	8.5**
	Cambodia	42.9
	Sudan	5.0
	Nepal	20.0***
	Guinea	Some
		76.4
	TOTAL	$1,519.8

* Soviet credits for $20 million to Pakistan and $290 million to Iran were not included in 1965 totals.

** $2.9 million grant aid

*** $2 million in convertible currency

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There was a significant improvement in organizational-party work and education on the ships, in the preparation and acceptance into the Party of the best workers, and in the education of young communists. There was more firm and direct leadership of Party organizations and groups in situ and a noticeable improvement in Party influence on all members of ships' crews. This also positively influenced the production work of the Steamship Line and the Waterways Administration. During the past two years the Steamship Line has fulfilled the plan for movement of freight and passengers and has been the winner of five Republic socialist competitions.

A rivermen's Party committee with the powers of a Party regional committee was created in 1964 for the purpose of improving Party leadership and elevating the role of primary Party organizations in Omsk.

The collective at the Omsk ship repair plant twice (in 1963 and 1965) initiated a socialistic competition among ship repair enterprises for scheduled and quality readiness of the fleet for navigation.

The Party's Oblast' committee Office approved of such initiative and recommended that all ship repair collectives in the Oblast' take part in the competitions. The progress of fulfillment of all responsibilities is systematically controlled by the Oblast committee. The work performed by the Party's organizations guaranteed the successful completion of winter ship repair.

It has become a tradition with us to hold a discussion at the oblast committe at the CPSU, before start of sailing, with the most active members of the administration, and Party, union and komsomol workers. Such discussions are very helpful.

The oblast committe resolutions concerning ways of guaranteeing that the Irtysh Steamship Line would fulfill the requirements for shipment of freight during the 1965 navigation season gave special attention to the necessity for improving economic work, introducing economy measures in the fleet, increasing the efficiency of ship's operations and bringing society at large into this work.

In particular, attention was given to the problems of operational safety in the fleet, and the selection, assignment and training of crews.

The rayon and city Party committees assisted in the development of training programs and selection of political group leaders on board every ship.

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During the past few years the fleet has obtained the services of many specialists who are capable of intelligently solving production problems. Serious attention is being given to their education in practical matters and production processes based on the experience of the leading collectives.

In connection with this, the Party oblast committee has recommended that the experience gained in the operation of the "Toil and Battle Glory" room at the Omsk ship repair plant be made available to all enterprises in the Basin and to use it in the work of accident prevention education in the merchant fleet, as well as captains' recommendations and state inspection of ships' crews.

The rivermen's Party and economic organizations have become more thoughtful in their selection of ship's collective leaders, ie, captains. Efforts are being made to increase the captains's responsibility for the state of affairs on board his ship by combining his master's duties with training work and eliminating unjustified transfers of crew members from one ship to another.

The oblast committee CPSU systematically organizes meetings of the most active rivermen at which the secretaries of the Obkom, Office members and department heads present reports, meet shipping workers, ships' captains and the workers from repair enterprises and ports.

These meetings provide a wide exchange of opinions, the best experience, collective formulation of measures for improving the operations of river transport, search for and utilization of reserves for increasing the volume of shipments, and improving the operation and repair of ships.

The work of the rivermen, the experience of leading hands, the life and times of ships' crews and collectives at shore enterprises, the activity of Party, union, and Komsomol ship organizations are depicted on the pages of the papers "Omskaya Pravda", Molodoy Siberyak", and "Rechnik Irtysha" and in Omsk radio and television programs.

An enormous role will be played by the resolutions of the XXIII Congress of the CPSU in the moral tempering of the crews and raising the level of organisational work among the rivermen.

The shipping requirements of Western Siberia's national economy must be fully met during the current Five-year Plan. Shipment of oil and petroleum products will increase by nearly four-fold. There will be further increase in shipments of timber, grain, construction materials and other freight.

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Solution of these complex problems will require further strengthening of the material-technical base of the Irtysh Steamship Line. The importance of the port at Omsk is greatly increased, particularly for dispatch of freight to the oilfields in the Tyumen' Oblast'. The port waterfront even now delays the unloading of freight cars carrying goods for transshipment. During the second navigation period, when the port at Tyumen' will not be able to accept freight for transshipment northwards because of shallow water conditions, the entire burden will fall on the port at Omsk. There are times when as many as 800-1000 freight cars stand in the port daily. Its production capacity permits unloading of only 200-250 freight cars per day and handling of up to 6,000 tons per day. It is vitally necessary to press work on the construction of the second stage of Omsk port, because this will raise the productive capacity of the port to nearly 200 thousand tons per season. However, the Ministry for Transportation Construction USSR and the Ministry for River Fleets RSFSR are very slow in getting this important project completed. It follows that a plan should be drawn up and finances and materials assigned so that construction of the port would be completed in 1967.

The shore combine for handling and transshipping timber at Omsk is the largest in the Basin, it handles up to 1 million cu m of timber in a season. In view of the increasing volume of arriving timber during the Five-year Plan, and to avoid the additonal expense incurred yearly by the "Omskles" combine because timber is dumped into the water at the roadsteads, the Ministry for Timber, Cellulose-Paper and Woodworking Industries USSR must take steps to have mechanized docks built at the settlement of Berezovo for off-loading timber from barges directly onto the shore.

According to estimates prepared by the "Giprolesprom" Institute, the capital investment in the construction of such docks at Berezovo will be recovered in four or five years.

The task is to convert, within the new Five-year Plan, the Berezovo Timber Transshipment and Woodworking Plant into a large centre for handling and dispatching timber to the consumer regions of the country.

The Irtysh Steamship Line presently handles delivery of petroleum products from the Omsk Oil refinery to the consumers in the Omsk, Tyumen' and Novosibirsk Oblasts. The refinery used two docks for shipment of petroleum products. From these two docks the upper Irtysh Steamship Line hauls petroleum products to the Pavlodar and Semipalatinsk Oblasts in the Kazakh SSR.

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Petroleum products shipping requirements already far exceed the capacity of the existing docks. There is an urgent requirement for the construction of a third dock and storage facilities and to have them in operation before the start of harvesting operations in the current year.

Crude oil, transported by the river fleet from the oilfields in the Tyumen' Oblast', presently occupies an important place in the shipping operations of the Irtysh Steamship Line. This year alone, now that the oil pipeline has reached the Irtysh river at Demyanka and ships are loaded at this point, the volume of oil shipments has grown considerably faster than planned. This makes it necessary to speed up unloading of oil at Omsk. It is impossible to handle the volume of oil shipments arriving at the present time using the existing facilities. It is necessary to quickly build a dock at the Omsk oil refinery and equip it with pumping facilities. We must recommend that the Gosplan USSR, the Ministry for Oil Refining and Oil Techno-Chemical Industries USSR, together with the Ministry for River Fleets RSFSR investigate the problems involved in the construction of additional docks at the Omsk plant and that they decide in the affirmative.

The growth in shipments of crude oil and petroleum products forces the management of the Irtysh Steamship Line to organize, in the vicinity of the village of Nikolayevka, a base for handling tanker ships, including cleaning, steaming etc.

A review of the operations of the Steamship Line during the past Seven-year Plan leads one to the conclusion that the utilization of the transportation fleet is at a low economic level. This is explained chiefly by the fact that the port and dock economy in the Basin has lagged behind the transportation and passenger fleets in its development. It is no coincidence that the Seven-Year Plan for volume of freight to be handled was not fulfilled by the Steamship Line, that costs rose by 23%, and recapitulation of funds was reduced by 13% in comparison with 1958.

It will be necessary to give serious thought to the development of ports at Tobol'sk, Surgut and Labytnangi in the next year or two. In 1965 alone, the lay-over of ships at Surgut amounted to more than 3.5 million tonnage-days, while on the whole there were more 3.5 million tonnage-days of unscheduled lay-overs at the docks throughout the Tyumen' Oblast'. Towed shipping is under way only 37% of the operational period, while costly self-propelled shipping is under way only 55% of the time.

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During 1964-65 alone, the Irtysh Steamship Line received over three hundred fleet units, and a significant addition to the fleet is contemplated for the current Five-year Plan. However, the facilities for ship repair and technical servicing are entirely inadequate in the Basin. Great difficulties are being experienced now with repair of tanker barges and tugs at the recently built Irtysh operational repair base. We cannot agree with the decision to begin construction of industrial projects at this base in 1967.

The Ministry for Transportation Construction USSR and the Ministry for River Fleets must move the date for start of construction at the base forward enough to ensure that it will be commissioned in 1968, as well as press construction of living accomodation for shipping staff.

The Steamship Line must be given assistance in organizing passenger transportation service on small rivers by consigning shallow draft hydroplanes to it. In the Omsk Oblast', such craft could be operated on the Tara, Om', Ishim, and Uy rivers, as well as for intra-urban passenger service.

Although the Steamship Line has enough such equipment for normal intra-urban service, it is not adequate for the traffic on weekends and holidays. Anyway, for some reason or other, open passenger decks are not being widely used on the Irtysh river whereon the townsfolk could spend their leisure hours in a "cultural" manner. The workers in Omsk suggest that the rivermen will not find themselves out of pocket as a result of this important step.

We must mention a serious shortcoming in the organization of passenger and freight service in the Irtysh Basin. This service is provided by two steamship lines: the Irtysh Line, which is a subsidiary of the Ministry for River Fleets RSFSR, and the Verkhne-Irtyshskoye, which is a subsidiary of the Main Directorate of River Transport Kazakh SSR.

A decade of experience shows that the organization of shipments by two steamship lines does not allow for maximum utilization of transportation facilities and handling equipment, it complicates service to the clientele, and causes lengthy lay-overs of ships during handling operations.

The time is now right for the unification of the two lines and their assignement to one Ministry.

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In the light of the resolutions passed at the XXIII Congress of the CPSU the rivermen's collective of the Irtysh Basin has even more responsible tasks before it.

The Oblast' Party organization is convinced that the many-thousand strong Irtysh rivermen's collective, while implementing the resolutions passed by the Party's XXIII Congress, will successfully cope with the tasks involved in the movement of passengers and freight during the 1966 navigation season, this being the first year of the Five-year Plan. The author of this article was: K Golikov, Secretary of the Omsk Obkom CPSU.

Pechnoy Transport
#5, 1966
(Full Text)

Waterways During the Current Five-year Plan

The Directives of the XXIII Congress CPSU for the Five-year Plan of development of the national economy of the USSR contain the tasks": to provide for the immediate expansion of the fleet, ports, and ship-repair bases and to improve shipping conditions on Siberian rivers. To continue the work of building a single waterways system in the European part of the country. To significantly raise the utilization of the Volga-Baltic Waterway". The rivermen will have to work very hard to complete these tasks during the current Five-year Plan.

The development of the production forces in the Eastern part of our country is proceeding at an accelerated pace. The oil and gas industry is booming in the Ob'-Irtysh Basin and so are the non-ferrous metal industry and other energy-consuming branches on the Yenisey and Lena rivers.

The role of the river fleet is presently very large here due to the absence of other forms of transportation. Water shipments of freight in Siberia are growing rapidly.

Because of the relatively smaller volume of shipments in the past, the route operations on Siberian rivers were carried out on a considerably smaller scale than was the case on the water arteries in the European part of the country. Guaranteed depths were planned in relation to the available small fleet, and on considerable stretches of the waterways such depths were not established at all. In addition, because of poorly organized work, the guaranteed depths on a number of sectors were left at levels above those planned.

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In order to cope with the new stream of oil freight from areas in the West Siberian Plain to Omsk and Novosibirsk, and for delivery of industrial and consumer goods on the return trips, the steamship lines will receive many large-tonnage fleet units in the current Five-year Plan, in particular, tankers and merchant diesels of the Volga type which require increased depths.

The expansion of shipments in the Ob and Taz, bays and along the Pur, Taz and Konda rivers also raises the necessity for increasing the capacity of routes and their establishment on a number of new sectors.

It is intended that, during the Five-year Plan, large scale work will be carried outon the Ob' and Irtysh rivers and these will be converted into first class arteries, the depths on the Tobol, Tura, Konda, Pur, Taz and other rivers will be increased.

It is envisaged that deep-water shipping channels will be cleared in the Ob', Pur and Taz river estuaries and approaches will be cleared to the many docks in the basin, particularly in the Obskaya Guba. New backwaters and ports will be built and existing ones expanded. It will be necessary to rebuild the shipping protection in the Obsko-Tazovskaya Guba with utilization of modern methods of automation and semiconductors.

The Irtysh rivermen have exceptionally responsible tasks in connection with the booming oil industry in the areas centering on this Basin.

It is also necessary to carefully study sand bar condtions on the Ob' and Pur rivers in order to achieve stable depths in the dredged channels and less filling-in of the latter. The Basin has received the necessary craft to do this work. The Irtysh rivermen must learn to work under maritime condtions more quickly.

The shallow Tobol and Tura rivers are of great importance in the delivery of freight. Because of the small amounts of water available, basic improvements can only be made by means of locking. But in view of the construction of a railroad to Surgut, locking in this case would not be economical.

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It is necessary to increase the depths of the channels on these rivers to the maximum possible by dredging until such times the railroad is built. Economic estimates show that every 10 cm increase in the depth will bring an economy of 100,000 roubles in transportation costs.

A great increase in oil shipments is envisaged towards Novosibirsk for the Lower Ob' during the Five-year Plan. The sector of the river from the estuary of the Tom' to Novosibirsk is made up of fine sand and has an underbed of basic rocks in may places, such a bed is very unstable and is very difficult to improve for shipping. The depth on this sector is one-and-one-half meters shallower than on the Irtysh up to Omsk.

The Ob' rivermen have the task of carefully studying the river and organizing large scale deepening, cutting and straightening operations on this sector.

The technical fleet in the Ob' and Irtysh Basins will be augmented with 30 modern powerful diesel-electric dredges which will be equipped with complex machinery and automation, and the total strength of the dredging fleet will be increased by 70% over 1965.

The Irtysh and Ob' rivermen will receive 9 diesel-electric fully automated suction dredges of 100 cu m/hr capacity and 3 super-powerful suction dredges of 2500 cu m./hr capacity each (these will be the first to be built); 6 suction dredges of 1000 cu m/hr and a powerful dragging dredge of 500 cu m/hr capacity will arrive on the Ob' and Irtysh rivers in 1966.

The Five-year Plan brings with it very large scale and responsible tasks for the basic improvement of shipping conditions on the Lena Basin rivers. It is envisaged to seriously undertake the deepening of the shallow water sector of the Upper Lena river to the guaranteed depth of a second-order artery. Conditions will be created on the Middle and Lower Lena to permit utilization of the transportation fleet to its full draught. The same depths will be necessary on the Lena tributaries Vitim and Aldan up to the main transshipping points.

It is envisaged that, in 1966-67, cliff-cutting operations will be undertaken on the rocky rapids of the Middle Lena in order to guarantee depths during the shallow water period, as well as on the rapids on the lower course of the river.

Systematic dredging and straightening operation will be undertaken on the Yana, Kolyma, and Indigirka rivers and also clearing of the bars on the Yana and Indigirka.

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The Lena rivermen will receive powerful diesel-electric dredges. An additional 15 dredges will be added to the 17 already held. The overall capacity of this fleet will be doubled. There will be 3 fully automated suction dredges operating on the Lena with a capacity of 1000 cu m/hr each.

It will be necessary to undertake considerable reconstruction of navigation protection on the Lower Lena and the Yana, Kolyma and Indigirka rivers.

As a result of the construction of the Krasnoyarsk hydroelectric power station of the Yenisey river, regulation of its flow and cliff-cutting and dredging operations will be completed during the spring shallow water period on this river.

Construction is underway and completion is expected in time for the 1969 navigation season on an inclined ship-lift at the Krasnoyarsk hydroelectric power station. This unique strcture, which is without example in world practice, will elevate ships of up to 2000 tons for a height of over 100 m. The Yenisey rivermen will have to work very hard to develop and organize the operation of the Krasnoyarsk ship-lift.

Further improvement of shipping conditons on the unified deep-water network of waterways in the European part of the USSR will proceed along the lines of completion of construction of a cascade of hydro-electric power stations on the Volga and Kama rivers and locking on the Lower Don.

During this Five-year Plan, construction will be completed on the Nizhne-Kamskaya and Saratov hydroelectric power stations and work will begin on the Cheboksarskaya hydroelectric power station. When construction of these hydro electric power stations is completed there will be a cascade of water reservoirs with lake sailing conditions stretching from the city of Solikamsk to the Kama estuary and from Kalinin to Volgograd on the Volga. Depths corresponding to those in the reservoirs will be maintained on the sector of the Volga river from Volgograd to the Estuary and on the Lower Don below the dams by means of control at the dams and by dredging operations. The rivermen on the Volga and Volga-Don Canal have already accepted their responsibility for increasing the depth on these sectors.

It is planned to build a large-tonnage fleet of draught that will permit a significant decrease in the cost of freight shipments. This fleet will have appropriate sailing conditions after the cascade of hydro-electric power stations has been built.

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However, the postponement of completion of construction on the Cheboksarskaya power station until after the end of the current Five-year Plan will not permit these ships to be used to their full capacity. The unified deepwater network will be limited by the sector from Cheboksar to Gorodets, a distance of 300 km, where the depth is a whole meter less than on the remainder of the network. From the point of view of river transportation, it is necessary to speed up work on the Cheboksarskaya power station.

Because of the expansion of irrigation farming in the Lower Don Basin, the diversion of water from the Tsimlyanskiy water reservoir is being increased. This will result in the amount of water released for shipping being reduced from 580 to 350-400 cu m/sec during the next ten years. This amount of water does not appear to be adequate to guarantee the depths needed by ships of up to 5000 tons af full draught. Locking on the Lower Don appears to be a foremost task.

The project for reconstruction of the Lower Don envisages the building of four low-pressure hydroelectric power stations to supply energy for transportation purposes, and the reconstruction of the Kochetovskiy hydroelectric power station. The first task to be completed during this Five-year Plan is the construction of the Nikolayevskiy and Konstantivovskiy hydroelectric power stations, since this will guarantee the required depths as far as the port of Ust'-Donets.

There are complicated operations in store for the rivermen of the Volga-Baltic Canal named after V.I. Lenin. Deepening the channels on the Neva and Svir rivers will be undertaken during this Five-year Plan; such work must be carried out on heavy soils and the channel-deepening fleet on the Volga-Baltic Canal will be augmented with powerful dredges for this purpose.

It is also planned to carry out large scale work on the White Sea-Baltic, Volga-Baltic, and Volga-Don Canals for the purpose of providing navigational conditions for large-tonnage ships. This includes expansion and deepening of individual sectors of the canals, measures for raising the levels in certain headwaters and strengthening the berthing walls on a number of locks. The operators and builders of hydrostructures must ensure that this work is completed in the shortest possible time and with the utmost efficiency.

Our scientists will make a serious contribution to the business of expanding the waterways.

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The TsIIEVT (Central Scientific-Research Institute for the Economics and Operation of Water Transport) must find the most effective technical complex of operations for improving shipping conditions on Siberian rivers and carry out economic studies.

We expect the scientists to develop further improvements in the construction techniques and mechanisms used on hydro-strctures and measures for increasing clear-way capabilities.

There are also a number of problems in complex mechanization and automation of route operations awaiting the attention of scientists.

Rechnoy Transport #5
1966
(Full Text)

A New Arctic Ice-Breaker

The ice-breaker fleet of the USSR has acquired a new vessel. The Arctic ice-breaker "Kiev" built in Finland has arrived in Leningrad.

Specifications

Power output.....22,000 electric HP.
Length.....122 m.
Width.....24.5 m.
Draught.....10.5 m.
Speed in clear water.....18 knots
Water dispalcement.....153,000
Weight of main prop.....37 tons
Weight of side props.....27 tons each

The Kiev will proceed to the Arctic this summer. The Kiev will be in charge of Capt. V.A. Golokhvostov.

Morskoy Flot
No 3, 1966

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Timber Shipments

Timber is one of the chief types of freight carried by river transport. The river waterways of the RSFSR must move 73 million tons of timber in rafts and 20 million tons in ships during this year. In the past, the river fleets have not met their quotas for transportation of timber. This work is behind schedule again this year, due chiefly to a late start in shipping, poorly constructed rafts, etc.. An important factor in the successful completion of this task will be close cooperation between the timber-shipping workers and the rivermen engaged in moving timber.

Vodnyy Transport
2 June 1966
Page 1
(Summary)

Timber Ship "Nevel"

The Zhdanov shipyard in Leningrad has launched its third timber ship since the beginning of the current Five-year Plan. The latest one, the Nevel', has a displacement of nearly ten thousand tons. It will be able to carry five and one half thousand cubic meters of timber through medium ice without the aid of an icebreaker.

Izvestiya
10 June 1966
Page 2
(Summary)

First Convoy

The first boat-loads of Siberia's black gold arrived at the Omsk oil refinery on the 8th of June 1966.

Trud
10 June 1966
Page 1
(Summary)

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Rivermen Make Deep Inroads

There are thousands of small rivers in the Soviet Union. These are shallow, narrow, and so far have been inaccessible to river transport. Now, thousands of km of these routes are being taken into use each year. The total length of developed routes on small rivers, lakes and water reservoirs was 49 thousand km last year. Development means deepening the river, cleaning the bottom and removing sunken logs.

The Irtysh Steamship Line has opened up the sector on the Kazym river from Berezov to the Kazanskaya cultural base, a distance of 170 km, and on the Tavda river from its estuary to the settlement at Boltyshevo. This is about average, amounting to 400 km. The Yenisey Steamship Line has developed a 100 km sector of the Bolshaya Kheta river, and the Lena Steamship Line has developed a sector of the Vilyuy from Syul'dukar to Chernishevskiy, near where the Vilyuskaya Hydroelectric Power Station is being erected.

Sovetskaya Rossiya
13 June 1966
Page 4
(Extract)

Shipping on the Northern Sea Route

The ice-breaker Sibir', the diesel vessel Nikolay Mironov and the steamship Cheremkhovo of the Far-Eastern shipping agency, have arrived at Provideniya.

Ice conditions both in the eastern and western sectors of the Arctic present difficulties. Notwithstanding the fact, cargo shipments will be 28% greater than last year.

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The following ice-breakers will operate in the Arctic:

Western Region

Lenin
Kiev
Krasin
Kapitan Melekhov
Kapitan Voronin
Kapitan Belousov
Vasiliy Pronchishchev

Eastern Region

Moskva
Leningrad
Sibir'
Admiral Lazarev
Yerofey Khabarov
Vasiliy Poyarkov
Semyen Chelyuskin

Hundreds of vessels of various shipping agencies will be used. Some of these will have reinforced hulls and special equipment. All ice-breakers, all diesel electric vessels of the Lena class and some vessels of the Dneproges class have been provided with photo-telegraphic equipment for receiving ice and synoptic data from shore based observatories.

In the third decade of June, the ice-breakers Leningrad, Moskva and Sibir' will escort the diesel-electric vessels Amguema, and Kapitan Gotskiy, the diesels Adimiles, Tayga and the tanker Baskunchak to the eastern area of the Arctic. At the end of June the first convoy will essemble at the Kara Gates and will proceed to Dudinka and Igarka.

Early in July the ice-breakers Lenin and Kiev will break up ice in the "Yenisey bottleneck" and cut a channel for transport vessels. Towards the end of July, the Lenin, Kiev and Kapitan Belousov will escort the diesel electric vessels Lena, Dneproges and the diesel Stanislavskiy from Dikson to the east through the Straits of Vilkitskiy. Later, the vessel Kapitan Belousov will operate in the southern part of the sea of Laptev and the Dmitriy Laptev Straits.

Shipping operation will be under the direction of Captain B. Maynagashev in charge of the western sector and Captain N. Nemchinov in the east.

Vodnyy Transport
16 June 1966
Page 4 (Abridged)

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The Assault on the Arctic

Navigation has started in the north-east. The diesel vessel Nikolay Mironov assisted by ice-reconnaissance aircraft, arrived at the port of Provideniya on 9 June. The latter port will be the concentration point of the first Arctic convoy. This will include the diesel-electric vessels Amguema and Kapitan Gotskiy, the diesel vessels Tayga and Amurskles and the tanker Baskunchak. Overhaul work has been completed on the ice-breaker Moskva - the flagship of the ice-breaker fleet.

Loading operations are being completed on the first vessels due to sail for Anadyr. These will be escorted by the ice-breakers Yerofey Khabarov and Sibir'. The ice-breaker Leningrad has left Nagayevo for Egvekinot and will break-up ice in the Area of Zaliv Kresta. The diesel vessel Taygonos and the steamship Cheremkhovo are en route to Provideniya and Ugol'naya.

Shipping activities in the north will be particularly active this year due to many factors:

(a) the program of the Five - year Plan calls for an increased production of diamonds and precious metals. This will require the shipment of additional equipment and supplies. A regular supply route has been established to the area of the Kolyma river and to the port of Pevek. Twice as much coal as compared to last year will have to be shipped to Pevek. A considerable amount of timber is due to be shipped from Tiksi to the Kolyma and to eastern Chukotka.

(b) According to preliminary forecasts, ice conditions will be particularly difficult.

(c) Cargo left over from the previous shipping season will have to be shipped to various points in the Arctic.

Vodnyy Transport
18 June 1966
Page 1 (Extract)

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Giant Ferry

Tyumen'. Twenty trucks of the "ZIL" model and two hundred passengers can be carried by the diesel-electric ferry "Dnepr" which was launched at the Tyumen' shipyard. It equals a four-storey building in height. The "Dnepr" will be assigned to service on the Bukhtarminskiy reservoir.

Gudok
18 June 1966
Page 1
(Full text)

Bakaritsa - Arctic

The steamship Lena berthed at the Bakaritsa dock in Archangel. This is the first vessel scheduled to make a trip to Nar'yan - Mar.

The flow of cargo for the Nenetskiy National Okrug will increase during the forthcoming shipping season. Naryan - Mar alone, is due to receive over 25,000 tons of various goods.

A passenger service between Archangel and Nar'yan - Mar will be inaugurated in July. This line, including a stop at Kolguyev Island, will be serviced by the steamship Kareliya.

A particularly large amount of cargo will be despatched to the Noril'sk combine. This will require dozens of large vessels.

The diesel-electric vessel Lena, now berthed at Bakaritsa, will visit Tiksi and the Novosibirskiye Islands.

Vodnyy Transport
9 July 1966
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(Slightly abridged)

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The Russian River Front

By 1970, the RSFSR river routes will be required to carry more than 280 million tons of freight, the freight handling in the ports will increase by more than 28% during the Five-year Plan. In the final year of the Five-year Plan alone, 123 million persons will travel on river boats.

Large Scale Development. The material-technical base of the river fleets has been essentially strengthened during the past Seven-Year Plan (1959-65). Highly-economical freight diesels, and passenger hydrofoil craft have been added to the transport fleets. Port facilities have been either built or rebuilt at Gorkiy, Ulyanovsk, Kuybyshev, Saratov, Kamyshin, Volgograd, Ust'-Donetsk, Leningrad, Perm', Tyumen', Novosibirsk, Omsk, Abakan, Osetrovo, Yakutsk and other points. River terminals have been commissioned at Gorkiy, Kazan', Ulyanovsk and Omsk. The V I Lenin Volga-Baltic Waterway is a child of the Seven-year Plan. River transport working capital had increased by 77.1% in 1966 over 1958. Freight turnover during the seven-year period had increased by 58.7% for the river fleets, and 85.5% in the eastern basins.

Further development of the river transport fleets is envisaged for the new Five-year Plan.

Increasing Freight Turnover. In 1960, the docks of the Ministry for River Fleets will handle 263.8 million tons of freight.

Oil. This commodity will continue to be moved mainly by the Volgotanker Steamship Line, which is expanding its operations. The total volume of shipments on this Line will increase from 18.9 million tons in 1965 to 26 million tons in 1970. Freight turnover will increase from 23.5 billion ton-km to 28.8 billion by 1970. This increase will be due mainly to the development of new freight flow, including crude oil from the Mangyshlak peninsula to the Volgograd refinery, petroleum products to the Kandalaksha and Petrozavodsk petroleum bases, and export shipments of mazut and petroleum products to the Baltic countries.

An increase in oil shipments of 1.7 million tons and 1.75 billion ton-km is planned for the Ob'-Irtysh basin due to the development of oil fields in Western Siberia.

It is also planned to increase the volume of shipments of east petroleum products in the east. The total volume of oil shipments in the RSFSR is expected to be increased by 40% by the end of the Five-year Plan, and freight turnover by 29%.

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Dry Freight. New shipments of apatite concentrate are being developed from the Kola peninsula to the superphosphate plants that center on the waterways in the European part of the country, along with shipments of nitrogen and phosphate fertilizers from the plants, and movement of Kuznets and Pechora coal to the western centers and for export to Finland and Sweden. In addition, it is expected that there will be a considerable increase in shipments of iron ore, timber and timber products.

Rafts. In contrast to the other types of freight, it is expected that rafting of timber will be significantly decreased. On the whole, the volume of rafted timber will go down by about 5 million tons by 1970.

New Routes Through the Volga-Baltic Waterway. The through-way capability of the Volga-Baltic Waterway will be significantly improved during the next five years. It is very important to note that most of the shipments planned for this artery are long-distance hauls. These include shipments direct from river to sea. In 1970, the Baltic ports will receive 1.3 to 1.6 million tons of exports through the Volga-Baltic Waterway. In addition, the Soviet ports on the Baltic will receive 250 thousand tons of pulpwood, and Volgograd will receive 3.3 million tons of Mangyshalak oil.

Passenger Comfort. Everything possible is being done to improve the confort of passengers on river boats. In 1970, river boats will cary 123 million persons. About 1800 passenger ships, including nearly 300 hydrofoil diesels, will service up to 1100 scheduled lines. The Irtysh, Ob', Amur and other rivers will be served by 60-passenger semi-hydroplane diesels travelling at up to 45 km per hours. The Volga-Baltic Waterway will have 45 luxury three-decker diesels.

Increase in Working Capital. A total of 100 million roubles has been budgeted for the river fleets. Of this, 850 million will be spent on augmenting the fleets, and the remaining 250 million will go for shore facilities.

Fleet. The river fleets will be augmented by the most modern and economical large-tonnage craft: diesels with a capacity of 5,000 tons, merchant ships and combined merchant-oil tankers of 2700 tons; tankers capable of seacoast cabotage with a capacity of 5,000 tons; larger barges, tugs, and so on. Larger power plants will be installed on ships.

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Ports. Construction of new river ports and reconstruction of existing ones will exceed 140 million roubles during the Five-year Plan, ie, it will increase by 80% over the 1961-65 period and will comprise 56-58% of all shore construction. On the whole for the RSFSR, 9.1 km of mechanized docks will be commissioned during the 1966-1970 period.

Routes. The work of forming a single waterway throughout the European part of the USSR will be continued during the Five-year Plan. The power stations on the Kama river should be completed and work will begin on the final stations of the cascade on the Volga river and the Nikolayevskiy dam on the Don.

Maintenance. It is envisaged that all types of river transport will be equipped with the latest automation. On the whole, 46.5 million roubles have been allocated to the construction of ship-repair facilities.

Living Accommodation. The State is showing much conern for the rivermen. This concern is manifested in the allocation of 86.8 million roubles for the construction of living accommodation for river transport workers and 10 million roubles for the development of their communal economy. The overall construction of living accommodation during the Five-year Plan will amount to 602.4 thousand square meters, of which 240 thousand square meters will be built in the eastern basins. Considerable capital has also been allocated for the construction of kindergartens, general education schools, hospitals, clinics and clubs.

The Center of it All-Economy. The ship and shore workers of the river fleets must get the greatest possible return from the vastly increased capital being invested in their branch of the economy; they must increase the productivity of their labor, lower shipping costs, and increase the profit return. The main economic indix, the profitability of river transport operations, shall increase from 9.7% in 1965 to 10.5% in 1970, or by 8%; whereas for the industry as a whole, it must increase from 6.6 to 10.3%, or by nearly 56%.

This account of the Five-year Plan for the River Fleets of the RSFSR was prepared by:

N Volkov, Deputy Chief of the Planning-Economic Directorate of the Ministry for River Fleets;

G Matlin, Doctor of Technical Sciences, Chief of the Economics and Water Transport Operations Division of the Central Scientific-Research Institute;

V Leonov and E Srednev, staff workers of the Vodnyy Transport.

Vodnyy Transport
12 July 1966
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(Extracts)

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Supplies for the North

The diesel vessel Kypu has left Leningrad on 15 July for the esturary of the river Kolyma. Over twenty large vessels of the Baltic shipping agency are being used to carry food and various industrial supplies for the north. Over 70,000 tons of freight will be shipped during the Arctic navigation season.

Sovetskaya Rossiya
15 July 1966
Page 1
(Full text)

Distant Voyages

The self-propelled barge "Indigirka" has returned to Tomsk from its third trip to the oilfields of the north. The rivermen delivered fruit, vegetables washing machines and modern furniture to the oilmen. The captain of the Indigirka is preparing for a fourth trip.

Izvestiya
28 July, 1966
Page 1
(Summary)

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MISCELLANEOUS

New Chart of the Arctic Ocean Floor

Soveit hydrographers and oceanographers have scored significant successed during the past twenty years in the hydrographic and hydrometeorological study of the oceans. The Arctic Ocean, in particular, has been quite extensively explored. Data obtained there by drifting stations and a number of comprehensive oceanographic and hydrographic expeditions change fundamentally our ideas of water temperatures, currents, ice conditions and floor relief.

The scientific significance of the data should be stressed, shedding light as they do on the hydrology and the hydrography of a complex and almost inaccessible ocean basin. Especially valuable are the results of investigations of the submarine topography of the Arctic Ocean conducted in the central part of it - the polar basin--and crowned by important geographical discoveries. These discoveries were brought forth by the whole history of the study and exploration of the Arctic regions.

Splendid contributions to the disclosure of the secrets of the Arctic seas were made by the Russian Great Northern Expedition of the first half of the 18th century; by participants in 19th and 20th century expeditions--Anzhu, Wrangel, Toll, Nansen and Amundsen; by Russian navymen in the Northern Hydrographic Expedition on the transports Taimyr and Vaigach, and by many other intrepid explorers, frequently acting on their own responsibility and risk. However, side-scale and systematic exploration of the Arctic regions was only begun in the first years of Soviet government of Lenin's instructions. In a historically short period, Soviet people studied and opened up for navigation the Northern Sea Route--the longest and most difficult sea lane through ice in the world. Ships are assisted in plying it safely and putting into ports en route on schedule by powerful icebreakers, a ramified network of hydrometeorological stations, and an efficiently functioning ice forecasting service.

Safe navigation in Arctic waters is promoted by such publications of the Hydrographic Department of the USSR Ministry of Defence as a set of charts ranging in scale from 1:500,000 to 1:2,000,000; a Manual of Navigation over the Northern Sea Route, and a description of the lights, signs and radiotechnical devices along the entire route. These publications embody data obtained by a large group of scientists at the Arctic and Antarctic Institute, and also hydrographers of the USSR Ministry of Merchant Marine.

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Up until 1937, that is, until the first Soviet "North Pole" Station (also the first drifting Arctic scientific station in the world) got down to work, our study of the Arctic regions was confined to its fringing seas. Nansen's viewpoint prevailed among the ideas concerning the relief of the Arctic Ocean floor. In keeping with his views, the Arctic Basin was depicted on the charts as an abyssal depression resembling a huge bowl with steep slopes and a flat floor. Even back in those days, however, some scientists in our country and abroad maintained that the structure of the basin's bottom was more complex. Most of them were in agreement that there was a considerable rise of the Arctic Ocean floor between Eurasia and North America in the shape of a submarine ridge. Some scientists arrived at this conclusion on the basis of purely theoretical considerations; others, on the basis of an analysis and generalization of the data of oceanographic and geophysical observations.

But depth measurements, the most objective and incontrovertible floor relief indicators, did not confirm this conclusion. The whole trouble was that there were extremely few of them.

Then, back in 1937-1938, the intrepid four Polar explorers headed by Ivan Papanin launched a deep-water study of the Arctic Ocean. Their efforts were continued, but on a broader scale, by the participants in the heroic drift of the icebreaker Georgy Sedov (1937-1940), who made a deep-water survey of the ocean floor. This survey revealed a sharply distinctive ocean depth of 5,220 meters, exceeding all others known theretofore, which came to be known as the Sedov Deep.

A qualitatively new stage in charting the Arctic Basin began in 1948, with the work started by Soviet high-latitude airborne expeditons, which made numerous landings on pack ice. At these points, the participants conducted scientific observations, including surveys, some taking just one day, others, many days. The results of this progressive method of investigating high latitudes were not long in making themselves felt. In April 1948, a depth of 1,290 meters, unusually small for the central part of an ocean, was recorded in the vicinity of the Pole. This and other measurements testified to an appreciable rise of the sea floor.

Upon comparing the new data with other scientific observations, Soviet Arctic researchers headed by Y. Gakkel, prominent scientist and Polar explorer, arrived at the bold conclusion that the measured depths indicated a submarine ridge. Their conjecture was confirmed. A transarctic submarine ridge connecting Europe and North America was discovered. It was named the Lomonosov Ridge.

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Subsequent surveys carried out by Soviet drifting Arctic stations and high-latitude expeditions defined more and more precisely the direction, limits and character of the structure of the ridge. However, the Eurasian part of the Lomonosov Ridge found really reliable representation on charts only following a systematic, dependably coordinated survey from the ice, carried out by military hydrographers. A valuable supplement to their investigations were echograms* of the ridge profile.

On the basis of all the available data, it has now been ascertained that the Lomonosov Ridge represents a fold-mountain structure of the ridge type, rising up from the ocean floor more than 3,000 meters in places. Its slopes are quite steep and it is completely covered by quite a thick layer of sediments. The ridge separates the Arctic Basin into two parts--the Pacific and the Atlantic side.

Further surveys revealed yet another rise on the pacific side of the Arctic Basin. This one is wider and deeper than the Lomonosov Ridge and also runs through the entire basin, parallel to it. It was named the Mendeleyev Ridge. Its northern part was surveyed by American Arctic explorers, who named it the Alpha.

The northern part of the extensive depression between the Lomonosov and Mendeleyev ridges that was brought to light is called the Makarov Trough on Soviet charts. And it is proposed to name the southern part of it the Submariners' Trough in commemoration of the cruises by Soviet atomic submarines and the scientific investigations carried out by their crews.

Another discovery that should be attributed to Soviet explorers is a protrusion of the continental shelf projecting far into the Canadian Trough. This protrusion was brought to light during the drift of the North Pole-2 Station in 1950-1951. It is referred to in several ways in the literature as the Chukotsk Dome and the Chukotsk Foreshelf.

The Atlantic side of the Arctic Basin, known as the Nansen Trough, was until recently thought to be a uniform depression with depths ranging, on the average, from 3,800 to 4,000 meters. In 1960, Professor Gakkel confidently stated in the press that there was a ridge in the central part of the basin running in from the Atlantic. He made this statement on the basis of an analysis of the data of geophysical investigations and depth measurements. The professor associated individual characteristic depths with the mountain peaks and deep valleys that are typical of mid-ocean ridges. A year later American explorers too wrote about the continuation of the mid-ocean ridge into the Arctic Basin.

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* An echogram is a tape record of the profile of the sea bottom drawn by a recording echo-sounder.

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The first convincing proof of the existence of a mid-ocean ridge in the Nansen Trough was the echograms obtained by Soviet and American atomic submarines during cruises in the Arctic Basin. Published with no indication of their geographical location, those obtained by the Americans cannot serve as materials for cartography.

The cardinal data concerning the relief of the newly discovered ridge were provided by special hydrographic surveys. Like the previous work of this kind, the observations were conducted by a large group of investigators making extensive use of aircraft and the very latest technical devices.

These investigations continue. But the material already obtained by Soviet scientists and hydrographers is sufficient to draw certain conclusions about the nature, character, and singularities of the mid-ocean ridge in the Arctic Ocean.

The ridge is of a volcanic nature with the longitudinal disjointedness and so-called axial rift zone typical of formavalley, and the mountains fringing it have a most pronounced character. In places, the depths drop sharply from several hundred meters above the summits of the mountains to 5,000 meters in the rift valley.

The ridge separates the Nanson Trough into two nearly equal parts. The southern part of the trough, whose distinctive feature is a somewhat lesser depth, retains this name on Soviet charts. But the northern part is called the Amundsen Trough here in our country in commemoration of the first depth measurement made in this area by the renowned Norwegian scientist. By a decision of the Presidium of the Geographical Society of the USSR set down on April 26, 1966, the ridge itself has been named after the late Gakkel, who has made important contributions to the study and coverage of the relief of the Arctic Ocean floor. Many submarine mountains and valleys which have appeared on the charts of this basin for the first time will be given names immortalizing the glorious deeds of Soviet scientists, oceanographers, polar explorers and navymen in studying the Arctic regions. For instance, we recommend naming one of the characteristic mountains in this chain the Submarine Mountain of the Lenin Komsomol, in commemoration of the historical cruise of the Soviet atomic submarine of the same name, and naming the rift valley explored by military hydrographers the Valley of Hydrographers.

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All-round study of the Arctic Basin continues, holding forth a promise of many new discoveries to come.

Red Star
2 June 1966

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Sunlight Instead of Icebreakers

Yakutsk. The ice cover in the Bay of Tiksi is being overlaid with a strip of sand which, it is said, will permit the sun's rays to break up the ice and thus open a channel to the open sea at least three weeks ahead of the natural breakup.

Hydrologists have surveyed the estuaries of the Yana, Indigirka, and Kolyma rivers with a view to air-dropping coal-dust, ashes and colored substances onto the ice to speed the breakup.

Trud
5 June 1966
Page 1 (Summary)

Chukotka Thermal Well

Magadan. Hot water poured from a well drilled in the permafrost near the Chukotka settlement of Novoye Chaplivo. The well's output is over seven tons of water per hour and its temperature is 93°C. The medicinal properties of the spring have much in common with those of the mineral waters at Matsesta and Pyatigorsk.

Gudok
21 June 1966
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Record Nugget

A nugget of record-breaking size was found at the Bilibin mine in the Arctic. It weighed-in at about seven kilograms.

Trud
2 July 1966
Page 4
(Summary)

Airborne Firefighters

Fifteen forest fires broke out after violent storms had passed through northern Siberia. The fires were immediately spotted by aircraft of the Air Fire Warden Service. Firefighters from the Western Siberian Forest Defence Base were immediately air-lifted to the scene.

Gudok
7 July 1966
Page 1
(Summary)

In the Far North and on the Road Volga

Photos 1-4 show typical scenes from the life of Yevenki reindeer herders in the Yakut ASSR. This collective is centered at the village of Sebyan-Kel', which is situated on a spur of the Verkhoyanskiy Khrebet. The collective now has nearly 18,000 head of reindeer and production is going up.

Sovetskaya Rossiya
8 July 1966
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Diamonds from Mirnyy

The diamond harvest at the Myrnyy diamond dressing plant is going well this year. Diamonds of 60.52 and 51 carats have been registered. Several of the precious stones weigh 40 carats and over. An interesting find was a 22.5 carat diamond of regular octehedral shape with another smaller diamond within it.

Sovetskaya Rossiya
17 July 1966
Page 2
(Summary)

Syktyvkar before the Festival

The occasion of the award of the Order of Lenin has drawn delegations from many parts of the Soviet Union to the Autonomous Komi Republic. The First Deputy Minister of the Council of Ministers USSR, D. S. Polyanskiy, will make the presentation. Today, Polyanskiy visited Vorkuta, where he familiarized himself with the enterprises at this transpolar stokehold.

Trud
23 July, 1966
Page 1
(Summary)

Order of Lenin for the Komi ASSR

The order of Lenin was today awarded to the Komi ASSR for its achievements in economic and cultural construction. The presentation was made by the First Deputy Minister of the Council of Ministers USSR, D. S. Polyanskiy, who delivered a speech on the occasion.

Gudok
24 July 1966
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TAILPIECE

Bear Visits Weather Station

When the weather station on barren Cape Pyagina, on the Sea of Okhotsk coast stopped sending reports, a hydrological ship with the chief meteorologist on board was sent to the site to determine the cause. They found the station completely dismantled. A brown bear had visited the site and, apparently attracted by the red pilot lamp on the transducer, proceeded to make a full investigation.

Trud
23 July 1966
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(Summary)

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JOINT INTELLIGENCE BUREAU
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GEOLOGY

(SELECTED WORKS)

Yu. A. BILIBIN

ACADEMY OF SCIENCES USSR
MOSCOW 1961

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Yu. A. BILIBIN

ACADEMY OF SCIENCES USSR

MOSCOW 1961

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LOCALIZATION OF GOLD DEPOSITS[1]

Linear and Central Arrangements of Deposits

One of the main tasks of the geologist in his search for gold is to establish some sort of regularity in the distribution of gold in the gold-fish. In the initial stages this regularity can be purely geometrical, but, from a study the geological structure of the region, it must be given a specific geological interpretation. In my own experience, I encountered two main types gold ore distributions: linear, or vein, and a central deposit. I call a linear distribution one in which the deposit is confined into a comparatively narrow strip, of considerable length, measuring in the tens or hundreds of kilometers. Normally, such strips are confined to the zones of faults, while individual deposits are confined to tectonic fissures within their boundaries. The parallel or sub-parallel distribution of the deposits has its origin here. In a central distribution, the deposits are situated within the confines of a more or less isometric or weakly distended sector, indicating, as it were, the common center. Tectonic fissures are distributed parallelly, radially or they mutually intercept, and are frequently connected with the outline and position of the intrusive body in the location. For a linear ore distribution, knowing one gold-bearing point, we must extend our search in both directions along the strike of the gold-bearing strip, normally more or less parallel to the strike of the intruded matrix. For a central distribution, prospecting work must be directed from the known gold-bearing point uniformly in all directions, in order to outline the sector within which the deposit is localized, and afterwards begin a search for new, comparable sectors. In their own turn, whole groups of deposits can be combined amongst themselves, according to one or another principle, into great gold-bearing regions, and the latter into gold-bearing systems, confined to one or another tectonic district. However, gold-fields and whole gold-bearing systems are units of a higher order; for prospecting work the main regularity is the one that determines the nature of the combination of individual gold deposits in their group.

ALDANSK RAION

The Aldansk gold-bearing region is representative of the central type of localized gold-field. Here, on the abraded surface of the Archean complex lies a horizontal or barely detectably northward dipping bed of Middle Cambrian

/limestones

.../2..

[1] Taken from the text published in "Problems of Soviet Geology", 1935, No. 5. - Editor.

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limestones and marls, overlain, in their own turn, by fresh-water sandstones and Jurassic slates. A series of syenite and syenodiorite laccoliths have intruded along the boundary between the Archean rock and the limestones; their tops have broken through the Jurassic beds, which is indicative of their post-Jurassic (or at least Upper Jurassic) age. The intrusion of laccoliths caused the development of quartizite veins near them and the formation of skarn matrices, which are sometimes mineralized, in the zones of contact with the limestones. Gold production of the region is associated with the quartzite veins near them and the formation of skarn matrices, which are sometimes mineralized, in the zones of contact with the limestones. Gold production of the region is associated with the quartzite veins and with the mineralized skarn matrices. Both one and the other occupy specific sectors near the laccoliths, creating, so to speak, "nodes of gold": the laccoliths are the centers towards which their associated gold-ore deposits gravitate. All the streams originating in or flowing through such gold nodes are auriferous. The laccoliths themselves, along with the groups of deposits gravitating towards them, lie in three belts on the Aldansk gold-bearing region, associated, apparently, with fractures in the Archean complex which served as channels for magmatic intrusion. The laccoliths situated in the Southwestern part of the region make up the longest belt. It stretches from the headwaters of the stream Inagl, right tributary of the Aldan river, across the headwaters of the rivers Ningerkhan, Seligdar, Tommot, Yukhta, Yakokut, Malyy Yllymakh and Olongro right down to the valley of Bolshoi Yllymakh. This belt of laccoliths is a faintly convex arch extending for about one hundred kilometers. The second belt of laccoliths runs parallel to the first at a distance of about thirty kilometers to the Northeast; it too is a faintly convex arch. In size, length and width, as well as in size of component laccoliths, it is significantly smaller than the first belt; its length is about 50 kilometers in all. It stretches from the basin of the Tamarak river across the Nezametnyy placer, the stream Kuranakh and the brook Zolotoy to the stream Dzhedkonda. Finally, the third belt runs in a northeasterly direction, perpendicularly across the first two, from the headwaters of the Tommot river across the headwaters of the rivers Ortosala and Kuranakh in the basin of the On'ya and El'kon rivers. It is about 75 kilometers in length. The gold content of the region is confined to these three belts. The entire Aldansk gold-bearing region is a clearly defined, very distinct gold node of great size, situated in the common belt of syenite and syenodiorite intrusions of the post-Jurassic Period (or Upper Jurassic), stretching over an enormous distance, about 1,000 kilometers, from the headwaters of the Amga river (and possibly from the lower reaches of the Olekma river) across the following raions: the Aldanskiy, Tyrkandinskiy and Uchurskiy to the basin of the Maymakan river, left tributary of the Maya river. This belt, in the form of an enormous, geologically unified system of gold-producing areas, is associated with the young faults in the Aldansk crystalline platform and forms a generally faintly convex arch, lying parallel to the southern contours of the Aldansk platform.

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ALLAKH-YUN'SKIY RAION

I encountered a completely different type of gold deposit localization in the zone of the Upper Jurassic (probably Lower Cretaceous) folding, which occurs in the Kolymskiy and Allakh-Yun'skiy Raions. Here we have a thick schistose-psammitic bed, encompassing deposits from the Permian to the Jurassic inclusive. This bed is intensively dislocated and breached by intrusions of Upper Jurassic (perhaps Lower Cretaceous) granites, with which the auriferous mineralization is associated. The distribution of gold in the region is clearly subordinated to the linear principle. The Allakh-Yun'skiy Raion is particularly characteristic in this sense in that all the main out-crops of gold-bearing rock are concentrated within the confines of one, comparatively narrow belt (no more than 10 kilometers in width), stretching approximately along the strike of the sedimentary series. This gold-bearing belt has been prospected for a distance of over 100 kilometers. It has not been prospected any farther along its strike, but there is every reason to expect it to continue in both directions. I had expressed belief in the existence of this belt in my working hypothesis during the summer of 1934. I associated its existence with the zone of the fault passing through the sedimentary series here and the accompanying layers of gold-ore quartzite veins. The presence of this gold-bearing belt was confirmed during prospecting work in the summer of 1934. In relation to the fault zone present here, I was only able to establish the presence of quartzite veins, which are found significantly less frequently along this belt; I was unable to fix the location of the fault zone itself because of the non-segmentation of its schistosepsammitic series and complete lack of any study whatsoever of its tectonics. These problems are among the main tasks for geological-prospecting operations in the raion during 1935. This belt contains gold along all of its length, but far from uniformly: some sectors are comparatively weakly auriferous while others are rich in gold. This makes it possible to find, within the confines of the belt itself, gold nodes to which all the main deposits in the raion are confined.

In my working hypothesis, I expressed the opinion that the presence of these gold nodes is conditioned by the distance of the gold-bearing bands from the granitic blocks. It should be mentioned that, the entire gold-bearing band is situated at a fairly considerable distance from the granites, but the richer gold-bearing nodes in it are located directly opposite those places, where the contours of the granitic blocks retreat from the gold-bearing band. All such nodes are located at a fairly uniform distance from the granitic blocks, about 22 or 23 kilometers away. This permitted me to say that the distribution of gold

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within the confines of a gold-bearing band is dependent on it dissecting concentric zones passing around the granitic blocks and which are, to a varying degree, suitable for the formation of gold ore deposits. The optimum zone for gold concentration occurs (in plan) at a distance of 22 or 23 kilometers from the granitic blocks. Naturally, the distance will vary depending on the tectonics of the sedimentary series, particularly on the dip of the sides of the granitic batholith and other causes, but this type of change should take place comparatively smoothly.

In its final form, the working hypothesis which at the present time I am using for further prospecting work in the Allakh-Yun'skiy Raion can be formulated in the following manner. In the Allakh-Yun'skiy Raion, the gold deposits are confined to comparatively narrow fault zones that formed soon after the period of ore deposition and which served as channels for circulation of solutions. Such auriferous zones extend, for tens of kilometers, approximately along the strike of the sedimentary series or at a small angle to it. The concentration of gold in these auriferous zones gradually increases in a direction away from the granitic blocks to an optimum distance of 22 or 23 kilometers (in plan) after which it again begins to decrease. My working hypothesis was accepted in this form for prospecting work in 1924 and from it we were able to predict the presence of a new gold node in the southern part of the auriferous band, which was subsequently confirmed by prospecting operations.

Gold traces have been found in the Allakh-Yun'skiy Raion outside the main auriferous band, but concentration of gold in these cases is insignificant and does not reach commercial amounts anywhere. Most of these points are located at an even greater distance from the granitic blocks, than is the main auriferous band. It is interesting to note that the most distant showing of placer gold was found by me in 1934, within the confines of a comparatively gently dislocated lower Paleozoic series, not far from the rim of the Aldansk platform, at a distance of 60 kilometers across the strike of rocks from the nearest granite block. The conditions under which the gold occurs here are undoubtedly indicative of its local origin and that it cannot be associated with any other intrusions in the locality. The concentration of gold, although not in commercial quantity for the Allakh-Yun'skiy Raion, is nevertheless significant enough to merit consideration in the formulation of a working hypothesis. Similar instances of significant concentrations of gold at very considerable distances from the granites speak in favor of the fact that, in the event of the main auriferous band being remote from the granitic block, the gold content will not be reduced abruptly, but will probably decrease in stages, and in the overall picture it will be a comparatively gradual reduction.

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KOLYMSKIY RAION

The principle of linear gold distribution is very clearly expressed in the Kolymskiy Raion. I had stated this principle in a fairly elementary form in reference to the Kolymskiy Raion. I had stated this principle in a fairly elementary form in reference to the Kolymskiy Raion as early as 1928, and my application of this principle to prospecting work in 1929 lead to the discovery of one of the largest gold-producing districts in the Kolymskiy Raion, on the Utinaya river. Further development of this principle and its application to prospecting work in the Kolymskiy Raion during 1930. At that time my plan was only partially carried out, but it produced large gold discoveries just the same (Urutukan), however, to a considerable extent its completion was postponed from year to year for various reasons of organization and, finally, it was completed during 1933 and 1934, producing new, large, gold discoveries (Toroplivyy, At-Uryankh, Mylga). In the Kolymskiy Raion we have comparatively narrow, sometimes interrupted, auriferous bands, consisting of series of gold-ore veins, stretching for many kilometers, sometimes for tens of kilometers, approximately along the strike of the sedimentary series or at a small angle to it. These separated series are grouped in a sub-parallel fashion into one, large auriferous zone, running in accordance with the strike of the sedimentary series and making up a linear unit of a higher order. I distinguished this auriferous zone as the main gold-bearing one in the Kolymskiy Raion. Individual traces of gold have also been found outside this zone, but these do not play an important role and consist of separated, comparatively small series of gold-ore veins, which cannot as yet be grouped into a unit of a higher order.

The matter concerning the distribution of gold in the separate series and in all the auriferous zone as a whole in relation to the granitic blocks has not been sufficiently well developed for the Kolymskiy Raion. Considerable numbers of small granitic blocks situated within the limits of the main auriferous zone are satellites of deeper-lying batholiths. It has been observed that the gold content in most cases is localized at a distance of five to ten kilometers, and sometimes up to fifteen kilometers, from the granitic blocks. Some geologists (P.I. Skornyakov) have pointed out the zonality in the distribution of mineralization in the gold-bearing vein series in relation to the granitic blocks, and the complete absence of mineralization near the granitic block. This latter phenomenon was observed by me as early as 1929 for gold-bearing placers, and in prospecting operations it became a general rule[1]. However, there are exceptions to this rule as well, even though they are rare; in some places within the limits of the main auriferous zones, but not necessarily within the limits of one of the gold-bearing vein series, we encounter significant concentrations of gold in the immediate vicinity of the zones of contact of the granite with the sedimentary rock mass. As far as we can figure out, they are associated

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1 Recently, gold-bearing placers have been discovered in the Kolymskiy Raion in the immediate vicinity of granitic intrusions. - Editor.

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quartzo-tourmalinic veins[2].

OTHER GOLD-BEARING REGIONS.

The strongly expressed principle of linear distribution of gold in the Allakh-Yun'skiy and Kolymskiy raions, where the presence of gold is associated with intrusions of Upper Jurassic granites, permits us to predict with considerable reliability that, in other regions with similar geological formations, particularly in the Indigirskiy and Tas-Khayakhtakhskiy raions, in which, although they have not yet been explored, we shall find this same linear principle of gold distribution.

Looking through the geological literature on old gold-bearing regions, we find the same linear principle of distribution in the gold deposits, this includes very close spatial association with granitic blocks in such raions as the Un'ya-Bomskiy, Selemdzhinskiy and some others. However, far from all the gold-bearing regions located in the zone of Jurassic folding have this linear gold distribution. First of all, there is the Okhotskiy Raion situated in immediate proximity to the Allakh-Yun'skiy and Kilymskiy Raions, which has a specific center for gold occurrence confined to the contact zone of a granodiorite block that is situated on the water divide of the Kykhtuy and Marekan rivers. All the streams originating on this gold-bearing node and flowing, on the one hand, into the Kykhtuy and the Gusinka and, on the other hand, into the Marekan, are auriferous. Prospecting operations which fanned-out from the Okhotskiy Raion in various directions have not given tangible results, lending further support to the suggestion that there is a central, and not a linear principle of localization involved in the gold deposits here. Apparently, this same type of localization is encountered on the Yamskiy peninsula as well, where the single case of gold occurrence on the Nankhatyndzhi river has to be associated with the contact zone of the granodiorite block.

In the Amurskaya Oblast' and the Zabaikal'ye we have many instances where the gold deposits are confined to the body of the granitic block itself or else to its contact zone. In all such cases we dealt with very clearly expressed centers of gold occurrence, wherein, on a comparatively small area, a significant number of gold-ore veins are concentrated. As examples it is sufficient to mention Dzhalinda, Bolshaya Ol'daya, Darasun, Balei, Srednaya and Nizhnaya Borzya, Shakhtama etc.. In all these cases we are very

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2 At that time, Yu, A. Bilibin entertained the notion that there could be an association between the auriferous mineralization in the Allkh-Yun'skiy and Kolymskiy raions and the granitic batholiths. Later on he discarded this hypothesis. - Editor.

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far from that linear distribution of gold which is so characteristic of the Allakh-Yun'skiy and Kolymskiy Raions. Only in those cases where the deposit is confined to a contact zone stretching for a fairly considerable distance do we have some similarity to the linear distribution of gold deposits, but this is more a slight geometrical change in the form of a central type of distribution, than it is the linear type described for the Allakh-Yun'skiy and Kolymskiy Raions.

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ON THE HISTORY OF THE KOLYMSKIY PLACERS[1]

Nineteen thirty-eight will be the tenth anniversary for Kolyma. During these ten years Kolyma has become one of the largest mining regions and the greatest gold producer. Suffice it to say that Kolyma now produces approximately as much of the metal, as the Trusts Zapsibzoloto, Lenzoloto, Baleyzoloto and Yakutzoloto combined. From this, one can understand the interest shown in Kolyma by the gold workers. The very first years in the development of Kolyma, when it was virgin territory and completely unexplored, now seem extremely remote and have already begun to fade into the haze of the past. You would be hard-pressed to find many who knew the story of those early years and who had been directly involved in it. Those original Kolyma pioneers are a small handful in all. Since I had a hand in the development of Kolyma from its very beginnings, I feel that some of my recollection will not be without interest.

Gold was first discovered in Kolyma in 1917 by a Tsarist Army deserter named Borisko, on the lower reached of the Srednikan river, approximately 8 kilometers below the mouth of the stream Bezymyannyy. Borisko died in a hole he had dug, and his gold discovery was not so rich as to attract the attention of his fellow prospectors. Prospecting continued, and in 1926 Safey Gaynullin and F.P. Polikarpov stumbled onto a richer gold deposit at the mouth of the Bezymyannyy stream. News of this discovery reached the Okhotsk prospecting region and Yakutsk, where assay samples of the gold had been sent, while the Head Office of the Yakutsk mining district received numerous enquiries from various persons concerning grub-staking parties for prospecting work. Grub-staking was not encouraged, but in 1927 the Yakutsk Government decided to send a prospecting party into Kolyma under the leadership of E. P. Bertin. However, because of financial difficulties the party was not dispatched. In 1928, the Geological Committee in Leningrad organized a semi-trading and geological-prospecting expedition in agreement with and equipped by the Soyuzzoloto, for the purpose of verifying reports concerning discovery of gold in that region and to determine its commercial value. I was appointed to head the expedition. Besides myself, the expedition consisted of my assistant geologist V.A. Tsaregradskiy, the geodesist D.N. Kazanli, prospectors S.D. Rakovskiy and E.P. Bertin, a doctor, a steward and fifteen other workers. The prospectors and workers were brought by me to Vladivostok

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1 This essay is being published for the first time and was written in March of 1937 by Yu.A. Bilibin. The essay is in the form of an attractive account of the Kolymskiy gold strike, written in the words of its discoverer, which is the chief value of this essay. - Editor

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from Aldan, where I had worked in 1926 and 1927 as a geologist for the Aldanzoloto Trust. Thus, all the members of the expedition, excluding the geodesist, the doctor and the steward, had some experience in working placers. We sailed out of Vladivostok on 12 June and in the early part of July we made a landing at the settlement of Ola, 35 kilometers East of Nagaevskaya Bukhta. The latter was completely uninhabited at the time and, sailing by it, we learned from the crew that it is the only bay on the whole Okhotsk coast where laden steamers can come right up to the shore, and that the Sovtorgflot intended to built a main base there to supply all of the Okhotsk seacoast with cabotage.

Landing at Ola, we then learned of the acute transportation shortage. There was no radio-station at Ola at that time, and the nearest stations were 700 kilometers away, at Nayakhana on the one hand and at Okhotsk on the other hand. True, there was a telegraph line which ran from Yakutsk across Allakh-Yun' and Okhotsk to Tauysk, 200 kilometers West of Ola, but it went out of action just at that time, and the telegram sent by me to Leningrad via Tauysk, for the Ol'sk RIK with a request that they supply transport, became lost in route. Our position was further complicated by the fact that there were two Okhotsk prospector artels at Ola which had been attracted by rumors of Kolymskiy gold and had rushed out to Kolyma. One small artel was already engaged in plundering operations at the mouth of the Bezymyannyy stream. The gold was not being handed over to anyone, supplies were obtained through the Ola residents, who were paid with gold. The latter sent the gold out with the crews of Japanese and Chinese steamers that were then under charter to the Sovtorgflot to supply the Okhotsk coast and which stopped at Ola fairly frequently.

For this reason our arrival at Ola and our efforts to get to Kolyma were not very favourably received by either the prospectors or by the local residents. They looked upon us has a state organization that wanted to establish controls and take away a considerable share of their profits. The RIK sided with them and began putting every conceivable obstacle in our path. There was no one we could appeal to, since, has I have already stated, the nearest radio-stations were 700 kilometers away, and the District Center was on the Amur river at Nikolaevsk. This policy of the RIK continued for more than a year, and it was not until the fall of 1929, when the RIK staff was removed and sent to trial for obstructing the development of the gold industry and an associated with it series of counter-revolutionary offences. Pack transport was organized only after an enormous effort had been exerted. However, although the RIK would dispatch prospectors directly to Srednikan, we were able to recruit transport for approximately half that distance, to the headwaters of those streams flowing into the Kolya down which one could continued by raft. We had a choice of either of two rivers for rafting, the Buyunda and the Bokhapcha. The launching point on the Buyunda was located 300 kilometers

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from Ola and the Kolyma had been carried for the past few hundred years. The Buyunda is a quiet, fairly deep river, down which the Sibvodput' expedition had descended not long before. Its one disadvantage was that it falls into the Kolyma 70 kilometers below Srednikan, and those 70 kilometers along the Kolyma must be traversed against the current. The launching point on the Bokhapcha was located approximately 250 kilometers from Ola near the old trail that had been in use several hundred years ago, but which had been abandoned because of a complete lack of fodder along it. The Bokhapcha was described as rushing, rapid-filled torrent, down which rafting is impossible: in winter, dog-teams cannot make their way among the boulders. The Sibvodput' expedition, whose program included exploration of the Bokhapcha, decided against this part of their work in view of such categorical reports. However, the Bokhapcha has one great advantage: it falls into the Kolyma far above Srednikan, making it possible to float directly down to its mouth.

One voice among all those of the local residents was very clearly heard. This voice belonged to an old Yakut named Makar Medov. He said that people do not sail the Bokhapcha river because they are afraid, but that people of the expedition's calibre would be able to navigate it. He maintained that the old, abandoned trail was much shorter and more suitable than the present one and that fodder could be found along it. Putting my faith in Makar Medov and the staff of my expedition I resolved to sail the Bokhapcha. This was all the more urgent, since we not only had to get to the Kolyma river, but we also had to find the most suitable route for supply. In this connection, if the Bokhapcha did prove navigable, it would have all the advantages over the Buyunda. The Ola RIK said without reservation that I was doing this deliberately, with the intention of drowning the expediton in the rapids.

During the first half of August, I, Rakovskiy and four workers with Makar Medov as our guide set off with pack transport for the Bokhapcha river, carrying supplies to last us up to the first or fifteenth of December. The remainder of the expedition remained at Ola to organize winter transport for travel to the Kolyma during the winter. On reaching the right tributary of the Bokhapcha, the Maltan river, approximately 250 kilometers from Ola, we parted with Medov, constructed two large rafts measuring 4 X 8 meters, loaded all our freight on them and set sail on strange waters. The Maltan was very low, and we barely made 80 kilometers in over three days. The rafts frequently became stuck on sand-bars, and it was necessary to get into the water and tow the rafts across the shallows. After three days we all had bloody epaulets on our shoulders. We finally reached the Bokhapcha and sailing was somewhat

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easier here, but the rapids were still ahead. Not far from the rapids we found the yurt of the Yakut Dmitri, and we made a rest stop here. His information about the rapids was very disquieting. Their total length is about 30 kilometers. They were innavigable particularly for our rafts. The only alternative was to leave the freight there and make all haste back to Ola, in order to get there before the snow. Dmitri was genuinely sorry for us and was almost in tears when we continued on.

We all fully expected to have to tote our freight over portages around the rapids or build new ones at the other end. I thought we would be very fortunate if we could negotiate the rapids in a week, but they turned out to be not so bad after all. True, on one occasion, we racked our brains for a long time figuring out a way to get our rafts past that chaos of rocks amongst which the rushing Bokhapcha river foamed. On another occasion our tasks seemed impossible, but we had to sail, and our desperate helmsmen, S.S. Durakov and I.M. Alekhin, steered our rafts through places where it seemed that we would certainly become stuck, but the force of the current carried us along just the same, and on one occasion right over the rocks. Sometimes, one raft or another would get stuck on the rocks for several hours; it would be necessary to off-load the freight, cut off the logs, and all disembark into the water, taking the chance of being swept off their feet and smashed against the rocks. But we were able to get the rafts loose every time. Because of the experience of our helmsmen and thepersistence of all the crew, the rapids were overcome in three days. We all heaved a sight of relief. Not only was our arrival on the Kolyma river assured, but we had also found a suitable navigational route for supply to the placer region. If our large, unwieldy rafts had successfully navigated the rapids during low water, then there would be no doubt that during spring water much larger scows could pass over the rapids without any trouble. In actual fact, for six years afterwards, until 1934 when a vehicle road reached the Kolyma river itself, the Bokhapcha river played a most important role in supplying the Kolymskiy placers, and a huge stream of freight and passengers navigated it yearly.

On 12 September, we arrived at the Srednikan on the same day as the prospectors from the artels. Here, at the mouth of the Bezymyannyy stream, 16 kilometers from the Kolyma river, spoilers had dug holes over an irregular area approximately 50 by 60 meters. The old artels regretted that the rich gold supply had been cut-off and would no longer be theirs for the taking. The newly-returned artels set to work digging holes and building barracks; we also built a barracks on the Bezymyannyy stream and set about exploring its valley, on the premise that the gold was carried out of there. Snow soon came. A

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forthnight after us, in deep snow, the Okhotsk "Office" of the Soyuszzoloto arrived at Srednikan, it was headed by F.D. Oglobin and the mining inspector F.R. Polikarpov. He was accompanied by yet another party of prospectors, who were very poorly supplied with food. A total of about 35 persons had gathered at the placer. All the prospectors were given legal standing.

Our prospecting and exploration work proceeded smoothly. But, as early as November, the newly-returned prospecting parties began to feel the food shortage. We had to share with them. December was approaching. Work was gradually coming to a halt. The food supply situation became progressively worse. The poorest supplied prospecting parties had already switched to dogs, horses' entrails and leather. One enterprising company, taking advantage of the fact that several horses in Oglobin's transport train had dropped dead without reaching Srednikan, had long ago packed its tent and stove and now lived on "fallen prey" moving from one dead horse to the other. On 1 December, Oglobin and I, accompanied by Safiy Gaynullin, were forced to go for food to the Yakutsk settlement of Seymchan 75 kilometers from the placer. But the Yakuts this village themselves were living in such an impoverished state that they were not able to give us any real assistance. It is quite possible that the situation was quite strongly influenced by the fact that they did not know whether we were friends or foes, nor, therefore, how to treat us. The only result of our trip was that we brought two of our expedition's horses back to the placer with us, we had bought these from a prospector when we arrived at Srednikan and had sent them off to S ymchan for the winter for feeding. These horses were now shot and divided up among the prospectors and the expediton's workers.

December 15 arrived, the earliest time of arrival of a food train from Ola. There was no sign of it. All work had long since ceased. A deadly silence hung over the placer. Men sat or lay in the barracks, only infrequently one or another of them would go outside to listen for the sleds. Frosts of 60° endured, the air carried sounds particularly well, and the approach of transport could have been heard for several kilometers. But there was only deafening silence all around. The situation worsened with every passing day. The transport did not arrive until the 26 December.

There was no end to rejoicing. There was baking, frying and cooking in every barracks, singing filled the air. Everyone had suddenly become active, the placer had a new lease on life. At the

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same time the remainder of the expedition arrived, along with the staff for the Soyuzzoloto office and, shortly thereafter, new prospecting parties. Prospecting and exploitation work was revived. For the remainder of the winter season, gold mining was concentrated on the same small sector at the mouth of the Bezymyannyy stream. In the course of the winter, this sector was dug up from end to end and across, but an extension of the placer was not found in any direction. In addition, a number of the placer's features were determined, which later proved to be characteristic for most of the Kolymskiy placers: the absence of a sharply defined layer of sand; the richest gold in the upper part of the rock bed among the vertically upright plates of the shale, extremely irrigular content. Of two prospecting parties working side by side, one would find a rich treasure trove, and the other nothing. By spring, this sector had been nearly completely worked out, and the most pressing problem was to find areas for summer prospecting operations.

By the way, exploratory work done by both the expedition and the Soyuzzoloto office did not provede an answer to this question either. We could hardly expect a great deal from prospecting which was being done without any preliminary summer survey and on the basis of statements alone. The left crest of the Srednikan, lying 50 to 70 kilometers from the placer, did not yield gold in commercial quantities, and only the right tributary, Raduzhnyy, showed gold on the borderline for mechanized commercial operations. The Bezymyannyy stream proved barren, the placer at its mouth and nearby in the Srednikan valley had a few rich, but small, auriferous hummocks. A small commercial plot with very irregular content was found in the vicinity of the Boriskinaya hole. These sources would not have lasted very long, and therefore the expedition's summer prospecting operations gave much attention to not only an evaluation of the future prospects of the region but also to satisfying the immediate needs of the gold industry.

In addition, the horse transport recruited for exploratory work would not be at the Srednikan earlier than the end of June. To save time, it was decided to break up into four detachments until transport arrived, two of these detachments would do prospecting work and two would do geological work, both to be carried out on foot and by raft. The Utinaya stream drew much attention. It falls into the Kolyma 106 kilometers above the Srednikan. Navigating past the mouth of this stream in the fall (we bagged three ducks here, hence the name) I had observed bald mountain peaks. Since gold mineralization is associated with granites in the Srednikan basin, and the Utinaya stream

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is located Northwest of it along the strike of the foldings, I suggested that we should find gold here. The prospecting detachment with S.D. Rakovskiy was sent there, they were to float down the stream from the mouth of the Taskan to the Srednikan, inspecting the right tributaries. The prospecting detachment under E.P. Bertin was supposed to start prospecting operations on foot on the head waters of the Srednikan river until horse transport arrived. V.A. Tsaregradskiy had gone up to the head waters of the Buyunda during the winter, in order to be able to raft down it in the spring doing a geological survey. The geodesist D.N. Kazanli and I departed for headwaters of the Maltan together, in order to repeat our previous year's water trip down the Bokhapcha.

As early as the previous fall I had argued with F.D. Oglobin about the need for organizing a spring trip down the Bokhapcha by several scows loaded with foodstuffs for the placer. However, he and the Soyuzzoloto official Lezhava-Myurat, who had arrived later, both turned down my proposal, expecting to bring in all their supplies to the placer by cartage. In the spring, it was clear that their hopes had been cruelly denied. The supplies that had been hauled in would last only to the end of the summer, after which it would be necessary to take the people out to Ola. Extremely urgent preparations for navigation were begun. I agreed to lend by expediton worker S.S. Durakov as the main helmsman for the trip and I took charge of the leading scow myself with a crew of workers from the expediton. Seven scows were built in all, each with a load-carrying capacity of 300 to 350 puds. Building the scows was very much delayed and they were not floated until after the spring water had passed.

The trip downstream was accompanied by enormous difficulties. The Maltan river had become very low, and at every bar the scows would sit on the sand. We could either off-load or, having collected up all the crew, we could shove the scows across the sandbars. This trip down the Maltan lasted for two weeks. Towards the end, the crews had become so exhausted that they began grumbling and were considering stopping the trip until the rains came. All in all, we reached the Bokhapcha after two weeks with a great deal of difficulty. Here the water trip went faster, but it turned out that most the crews were dry land sailors. More than half of them were aborigines, there were many old men and cripples. Therefore, Durakov and I, along with one or two other helmsmen, steered the scows across the most dangerous rapids. Most of the crew would by-pass the rapids along the shore. The scows finally reached the Kolyma. Generally speaking, the river trip was successful; although some of the freight had gotten wet, most of it reached the placers safely and the food supply situation was saved. This was the only year (up to 1934), when the supply of food lasted without any pinching right up to the time winter transports arrived.

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Since it was already the beginning of July, I left the water caravan at the mouth of the Bokhapcha and, getting into a boat, I was at the mouth of the Srednikan river in 24 hours. Along the way I glanced-in at the mouth of the Utinaya, where Rakovskiy was supposed to leave a note concerning the results of his work. I found this note in a crack in one of the trees. It said: "There is a very good gold in this river" (translator's note: this message is given in English in the original text). Numerical data was also given. This precaution was taken by Rakovskiy because several free-lancing prospectors had set off into this region earlier. On the Srednikan river I learned from Rakovskiy that he and his detachment had walked the whole Utinaya river (about 25 kilometers) with packsacks on their backs; excellent samples were obtained everywhere, but a rich commercial placer was not found. Late on the evening of 12 June the detachment gained the left headwaters of the Utina and made camp. Their food was running out. The next day they would have to make their way hungry to the mouth of Utinaya, to the navigation base. They lit a fire and began to boil tea. In the evening gloom, Rakovskiy took his pick and began digging away at the river bank. The first scoopful yielded two grams. Rakovskiy did not believe his eyes, but subsequent shovelfuls also yielded from one two grams. When the detachment heard of this they were all very much excited. Weariness and lack of food were forgotten, and no one wanted to sleep. But they did have to go out to the river mouth the next morning. This discovery coincided with the anniversary of our departure from Vladivostok. The stream was called Yubileynyy.

In the meantime, at the Soyuzzoloto office on the Srednikan river the atmosphere was depressing. Not knowing the reason for the delay of the water transport, they thought it had been unsuccessful. Gold-mining went poorly. Mining work was concentrated on the Boriskin sector. Some of the parties were doing very well, but most of them somehow or other could not make a strike. They did not believe in the Utinyaya gold-strike, they thought it was a lone rich hummock that could in no way be taken as an indication of the wealth of the whole stream.

Transport for the expedition's prospecting operations arrived, and things were going normally. Bertin was taking samples on the head-waters of the Srednikan, Rakovskiy was lower downstream, Tsaregradskiy was doing a geological survey of the whole basin. I decided to set off for the Utinyaya river, in order to study it from a geological point of view and

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evaluate the stream found by Rakovskiy. In addition to this I organized the supernumerary workers in our expediton and, in agreement with the office of the Soyuzzoloto, I directed them to make preparations for Utinaya. The office did not risk its own prospectors on a completely unexplored area. We travelled upstream on the Kolyma for four days and on the fifth day we arrive at the Utinaya river. It lived up to our expectations. From the very beginning the prospectors found "bags" of gold. My own tests fully confirmed the data provided by Rakovskiy concerning the Yubileyniy and the adjacent Kholodnyy streams, I even got somewhat better results than had Rakovskiy. There was no doubt that these two streams were of great commercial significance. In the winter of 1929-30, the Soyuzzoloto office began prospecting on it and, up to 1933 inclusive, it remained the most outstanding gold supplying region on the Kolyma. At the end of August I returned to the Srednikan. News of the prospectors' success on the Utinaya river greatly improved the spirits of the administration and the prospectors. Everyone wanted to go to Utinaya. That fall, two more parties were sent there, and they had equal success. Meanwhile, it was time for the expediton to leave for Ola and from there for the "Mainland". In addition to the Utinaya, during the summer season excellent prospecting samples were obtained from a whole series of valleys, some of which, after exploration, were found to have commercial quantities of gold. The geological structure of the region was determined in general terms and certain regularities were observed in the auriferous content, which were later used as the basis for directing geological-prospecting operations for a number of years. In addition, a gold-ore vein found on the bank of the Srednikan river not far from the placer played a very important role in the history of Kolyma even though, after exploration, the vein proved unworkable. Prior to my departure for Utinaya, Rakovskiy had taken an excellent sample of placer gold on the bank of the Srednikan river. Since, at that time, there was a very urgent requirement for new areas for prospecting operations, Rakovskiy and I set off the next day to inspect the site, in order to determine whether or not it was suitable for a prospecting party. On inspection it turned out that the bed of the Srednikan is dissected here by a porphyry dike, interspersed with an abundance of of quartzite veinlets with sulphide mineralization. Departing for Utinaya, I sent samples of this dike to Tsaregradskiy, who found a rich content of gold in it. This content was subsequently confirmed by chemical assay in Leningrad. Unfortunately, only one outcrop of this very thick and long dike was tested, and consequently the results were not definitive. Among the achievements of the expedition is the first discovery of tin ore on the Kolyma river, this was done by me in Leningrad during examination of slicks that had been collected by Rakovskiy and Bertin. This was the first time that tin ore had been discovered in this enormous Oblast', now known as the Verkhoyansk metallogenic province.

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Prior to the expedition's departure from the Srednikan river, most of the workers took their pay and went prospecting on the Utinaya. En route to Ola I gave Tsaregradskiy the task of exploring the Gerba and Myatik rivers for the purpose of inspecting the old abandoned trail, described by Medov. When the Tsaregradskiy detachment reached the place where, apparently, grazing ended, the Yakut guide lay on the ground, burst into tears and categorically refused to go any further. Only much pleading and a guarantee from Tsaregradskiy to fully compensate for all horses that perished finally convinced the guide to set out on this hazardous route. Imagine his surprise when he found excellent horse pasture along all of the route, and the trail itself was much shorter and much better than all the other trails that he knew. Later on, all supplies to the placer region were sent over this route, and it was selected for a highway.

It was not our lot to depart to Ola. In the summer of 1929, the Committee for the North built a cultural base on the Nagaevskaya Bukhta, an agency of the Sovtorgflot was set up and all steamers were required to report there. At that time only a few of them were calling in at Ola. From that time forward, the main stream of Kolyma passengers passed through the Nagaevskaya Bukhta and not through Ola.

As a result of the expediton's efforts, I left Kolyma much impressed with a new, grand, metallogenic and, in particular, an auriferous, province. I was most optimistic about its commercial prospects. On arrival on the "mainland" I made appropriate reports in Vladivostok at the local office of the Soyuzzoloto, I paused for a few days in Irkutsk and in Moscow, where I informed the Chief of Vostokzoloto G.I. Peryshkin and the Chief of Soyuzzoloto A.P. Serebrovskiy of the results of our work and the prospects for the Kolyma region. Everyone listened to me with great attention, they were all very interested in the Kolyma, but a large correction factor for my "Kolyma patriotism" was applied to my evaluation by all. At Vladivostok I was bluntly told that Kolyma still has a long way to go.

On my return to Leningrad in December 1929, I began promoting the Kolyma as strongly as I could. I had little difficulty in organizing a second Kolyma expedition in 1930. Besides an ore-party for exploration of the Srednikan vein, I planned for five geological parties in my plan of work for the expedition. I already had an idea concerning the distribution of gold throughout certain belts, running along the strike of the zone of folding. The prospecting parties were sent out accordingly. The Taskan reconnaissance party set off to the north-west from the Utinaya, along the auriferous strike, for the purpose of exploring the inter-river area between the Debin and the Taskan. Another party was sent off to the south-east from the Srednikan. Between the Utinaya and the

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Srednikan, two parties were deployed: the Kolyma group to explore the tributaries of the Kolyma between the Utinaya and the Srednikan, and the Urutukan group for exploration of the Urutukan river basin, lying directly South of the Srednikan and the Utinaya. The fifth group was dispatched to the Bokhapcha above those rapids where, in 1929, I had detected faint auriferous content and I surmised this was another auriferous belt.

In May 1930, the expedition, headed by Serebrovskiy, departed from Leningrad. In addition, the Soyuzzoloto was dispatching increased numbers of prospecting teams to the Kolyma river, as well as foodstuffs and technical equipment. A winter start for the Kolyma was made by the new director N.F. Ulybin, while the Chief of the geological-prospecting office P.M. Shumilov, chief prospector S.D. Rakovskiy and others went with the expedition. The Kolyma's bright prospects and the difficulties of development urgently demanded that it be joined by highway with the Nagaevskaya Bukhta. Accordingly, a highway team had been sent here for the purpose of doing a survey. Thanks to my "Kolyma patriotism" I was able to attract attention to Kolyma but, nonetheless, not to the extent I wanted. I remained in Leningrad for the purpose of drawing up estimates for the first expedition and to organize a new one in 1931. However, I did not consider the current system of operation on the Kolyma as satisfactory. I therefore made the suggestion, in the spring of 1930, that a permanent "Indigirsko-Kolymskiy geological-prospecting Bureau" be organized with large appropriations for geological exploration operations. I spent the winter of 1930-31 putting this idea into practice. Applying geological-statistical methods, I attempted to evaluate the gold industry prospects for Kolyma in figures. The resulting figures initially filled me with holy terror. But no matter how I tried to adjust them I always came back to the same answer. In the end, I accepted the figures and use them as the basis for my "plan for development of geological-prospecting operations on the Kolyma". In outline, this plan required an investment of about 4.5 million rubles for exploration during the first year, and by progressively increasing the capital investment I considered it possible to ensure the reserve of placer gold on the Kolyma, by 1938, on a scale equal to 4 times the amount of gold mined in the Soviet Union in 1930. Using these figures, I began to work for Kolyma.

During the winter of 1930-31 I had to make an endless number of reports, to write summaries, to advise, caution and urge. Some, hearing about Kolyma for the first time in their lives, naively asked: "has gold been found there?" others, having heard of it, considered by figures fantastic, unrealistic and demanded to be shown explored reserves.

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They considered my arguments on the regional distribtuion of gold presence, and of the enormous auriferous district as being unfounded. The Utinaya placer, since it had not yet been explored, was considered a weak foundation for large expenditures, and the one argument which always had some effect was the Srednikan vein. Everyone considered it erroneous to apply the content of the samples to the whole mass of ore, and yet it was this vein which accounted for the largest expenditures on the Kolyma at that time.

In spite of my enormous expenditure of energy, all my efforts ended in a fiasco towards the spring of 1931. True, a permanent Kolymskiy base was organized, and I, as the technical director of this base accompanied by a whole staff of geologists, departed from Leningrad in May 1931. However, the funds for operating the base were reduced by many millions, without any hope of increasing them in the near future. I had to bury my plans for development of the Kolyma.

The Soyuzzoloto also significantly expanded its operations on the Kolyma, but, nonetheless, not to the extent that was required. Now, special ships with freight assigned only for Nagaev were to depart from Vladivostok. Arriving were hundreds of prospectors, much horse transport, forage, food stuffs, and technical equipment. Kolyma enjoyed wide popularity throughout the whole of the Far East.

I hardly recognized Nagaevo. A fairly extensive settlement had grown up around the buildings of the cultural center, and it was rather difficult to find this center at first. The picturesquely scattered prospectors' shanties stretched from the settlement up the mountain, towards the Magadan stream. At this time Nagaevo was the center for the Okhotsko-Yevenskiy District, but most of the interest was centered on the Kolyma placers. Ships arrived, hundreds of passengers and thousands of tons of freight were dumped on the shore; all were accomodated in barracks and warehouses and, after that, dispatched across the taiga in small parties to the placers.

The taiga again, and then again rafting down the Bokhapcha. This river had now come into its own and, during the summer, very few if any arrived at the placers, who had not used the Bokhapcha. It was considered a great extravagance to use horses from Nagaevo instead of water transport. Although Nagaevo had been greatly changed in a year and a half, the placers had altered significantly less. The Srednikan had remained about the same. Utinaya, naturally, had changed: two placers had been developed here, the Yubileynyy and the Kholodnyy, as well as a dock for the Placer Administration at the mouth of the

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Kholodnyy stream. But the whole way of life had remained the same. There were the same deficiencies in transport and communications with Nagaevo, the same shortages in food-stuffs and technical equipment, the same speculation as to whether or not the water transport would arrive, the same urgent expectation of the first winter transports and the cessation of work in December due to the food shortage.

The 500 kilometers separating the Kolyma from Nagaevo were an insurmountable barrier for the supply people. This situation had an extraordinarily adverse influence on the development of the Kolyma, and the obstacle was not really insurmountable. It is true that supplying Kolyma was a difficult matter, but the fact remains that the people in charge of supplies did not know how to organized themselves, they had absolutely no knowledge of taiga conditions, and they were completely helpless to cope with difficult situations. I need only mention that during the two winters of 1931-32 and 32-33, more than 2,000 horses were lost in supplying the placers. All branches of the placer economy, including operations, prospecting, and particularly the geological exploration work were very seriously under-supplied.

In terms of the discovery of new gold-producing areas, the Kolymskiy raion stands out from the other gold-producting regions. This is the first region where gold was discovered (with the exception of the first insignificant discoveries by Borisko and Gaynullin on the Srednikan) by geological-prospecting parties as the result of systematic prospecting operations. It is all the more sas that the geological operations of other branches of the placer economy suffered from the incompetence of the supply organization. It seemed perfectly natural that geological-exploration work should be directed to those places where gold is most likely to be found, and that supply should be sent there, where gold has been discovered. At the beginning of 1931 a new principle was introduced on the Kolyma: regardless of geological data, gold was to be sought in those areas which could easily be supplied. This erroneous principle did an extraordinary amount of harm to the development of the Kolyma.

V.A. Tsaregradskiy's expediton, arriving in Nagaevo early in the summer of 1930, again encountered the severe shortage of transport, which was all engaged in supplying the placers. Only two of the parties, the one on the Taskan and other on the Urutukan, having floated down the Bokhapcha, were able to make the Kolyma by the end of the summer. During the short inteval of time remaining for them before the onset of winter, they were successful in finding several modest commercial placers.

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During the summer of 1931, the expedition conducted full scale operations and these produced significant results, but they were not fully successful because of the notorious supply situation. The party led by S.V. Novikov, exploring the Urutukan river basin, discovered a whole series of very rich placers. The party led by D.A. Kauzov was transferred from the right tributaries of the Kolyma river into the basin of the Maltan river, which turned out to be barren. In 1933, a very rich placer was discovered on the Toroplivyy stream between the Utinaya and the Srednikan. The party led by D.V. Voznesenskiy was supposed to have explored the exceptionally promising tributaries of the Taskan and the Mylga in 1931, but they were again transferred closer to the coast in the basin of the Tyan'ka river, which gave very average results, while the rich placers on the Taskan and Mylga (At-Yryakh, Khtatynnakh, Shturmovoy) remained undiscovered for another three years.

Base geological parties did not achieve a great deal in 1931 either. Due the lack of animal transport they were forced to operate by water transport along the Maltan river, the Bokhapcha and the Kolyma, and their work resulted in mainly a geological survey of the shoreline. In spite of the fact that the whole plan of geological-exploratory work was compromised, the discovery of the Urutukan placers significantly strengthened Kolyma's prospects. Another interesting discovery was made on the Utinaya river late in the summer of 1931. Among the wash-down of the Kholodnyy stream could be seen large quartz boulders with rich showings of gold. This discovery immediately made it necessary to carry out ore prospecting of the type that had been done in the summer of 1932 and had led to the discovery of the Utinaya gold-ore vein.

Now, Kolyma's prospects really needed to be supported by its explored reserves. But, after the fall of 1931, only very meager explorations were carried out because of the lack of supplies. Further supplies were threatened with being completely cut off. Therefore, the explorers had no alternative but to engage in supply operations themselves. At Nagaevo, S.D. Rakovskiy quickly undertook to organize exploration parties. One after another the parties set off for the placers, they were fully equipped with all the necessary instruments and food to last them to the end of the survey season. Exploration began to improve. This was a turning point in the history of the Kolymskiy raion: On the fifth of February 1932, the Dal'stroy Trust arrived in the Nagaevskya Bukhta aboard the steamer Sakhalin.

As it turned out, I was wrong in thinking that my efforts to realize a plan for the development of geological-exploration work in

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Kolyma would be unsuccessful. The discussions I started about the great prospects of Kolyma did not die out after I had departed. Through channels unknown to me they finally reached the Soviet of Labor and Defense. The order was given to have all information on the Kolyma collected, these were mainly my type-written reports and summaries. What I had been striving to achieve at the Trusts and the Headquarters, was very readily fulfilled by the Soviet of Labor and Defense. The trusts and Headquarters did not believe my evaluation of Kolyma's prospects, but the Soviet of Labor and Defense did believe them and immediately undertook wide development of the Kolyma region. Although there still were prospects, it was decided to organize the Dal'stroy Trust for the purpose of developing Kolyma. The Srednikan gold vein played a considerable role in this as well.

Strictly speaking, the arrival of the Dal'stroy was not so much a turning point in the development of the Kolymskiy placers as it was for the Okhotsk Seacoast. Because it had colossal material resources at its disposal, the Dal'stroy provided an unusual incentive to the development of not only the Nagaevskaya Bukhta and the immediate environs, but more remote points on the coast as well, such as Ola, Tauysk, Arman' and others. Insofar as the placers themselves were concerned, the status quo was preseved here for another two years, during 1932 and 1933. This consisted of a continuing acute shortage in supplies and the attendant slow development of the placers. The lack of communication between the coast and the placers, which existed prior to the arrival of Dal'stroy, was only accentuated with its arrival. The 500 kilometers that were such a difficult obstacle for the Soyuszoloto supply people, proved to be an even greater obstacle to the people of the Dal'stroy.

The basic landmarks in the development of Kolyma were indicated prior to the arrival of the Dal'stroy: The Nagaevskaya Bukhta as the main supply base for the coast; the shortest and most suitable route for a highway through the placers; the Bokhapcha as a subsidiary supply route before the road was built; the main gold producing regions, further prospects for extenting gold mining North-westward etc. all this was known before Dal'stroy arrived. The Dal'stroy received a legacy, although a small one, of a more or less ready economy at the placers, a well trained geological exploration organization with many highly qualified personnel, which to this day make up the main core of the geological exploration cadres of the Dal'stroy, but, in two years, it was not able to organize that which was poorly developed at its arrival, and that was the supply technique. The reasons for this remained the same, complete ignorance of the Northern taiga, disregard for the specialized conditions of placer operations and the experience of the old hands on the taiga. For these reasons the Dal'stroy committed a

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number of errors, and it may be quite readily proven that if it had not been for these errors, Kolyma would have been developed a year and a half or two years earlier. It was only after two years of training in taiga operations that the Dal'stroy was able to properly organize its own work and the results were not slow in coming. The year 1934, when the highway was laid to the Kolyma river placers, is the turning point in their development.

The arrival of Dal'stroy in the Kolymskiy Kray heralded the end of the first and pioneering period in the development of that region and the beginning of the second period, that of great commercial construction.

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ON THE FUTURE OF GOLD PRODUCTION IN THE KOLYMSKIY RAION

The occurrence of commercial minerals in any region depends entirely on the geological structure. Some commercial minerals (salts, coals, and certain manganese and ferric ores) are associated with sedimentary formations and are dependent for their distribution only on the stratigraphy and tectonics of these formations, other ores, mainly those genetically associated with magmatic rocks, depend largely on the nature and locality of the latter, as well as on the tectonics of the intruded sedimentary series. Since the Kolymskiy raion is mainly a metalliferous and, in particular, an auriferous region, when studying its geology we should concern ourselves chiefly with its magmatic rocks and the tectonics of its sedimentary series. However, since tectonic formations cannot be identified without accurate information about the stratigraphy of the sedimentary beds, and the age of magmatic rocks is determined only from their relationship to various horizons of sedimentary matrices, stratigraphic problems must be given two-fold meaning. These problems were sufficiently adequately covered in the summary for the years 1928-33 in terms of contemporary knowledge of the geology of the region; in this chapter I would like to roughly outline the tectonics and petrology of the region and, on the basis of this, to give an outline of the distribution of commercial minerals in it.

The Kolymskiy auriferous region is situated on the Verkhoyansko-Kolymskiy geosyncline. This geosyncline apparently existed since the Cambrian, and probably from pre-Cambrain time, girdling the Siberian platform from the North-East. This geosyncline was very greatly reduced during the process of Paleozoic folding due to the increase of folds along the edge of the Aldansk platform and the formation of an intensely folded area on the middle current of the Kolyma. This middle-current-Kolyma platform apparently served as a shelf during the Mesozoic time, at various times it would have been flooded by an epicontinental sea and at other times it would have been the coast of the sea flooding the Verkhoyansko-Kolymskiy geosyncline. Filling of the Mesozoic geosyncline with sediments continued throughout the whole of the Triassic and the first half of the Jurassic Ages. The Upper Jurassic folding, which formed a great semi-circle around all the Aldansk platform, also dried up the Verkhoyansko-Kolymskiy geosyncline. The zone of this folding stretches approximately from the mouth of the Lena river (Kharaulakhaskiy Gory) across all the

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Verkhoyansko-Kolymskiy Kray, is partially submerged under the sea of Okhotsk and again reappears in the Udskiy Kray. Proceeding farther into the basin of the Zeya and in the Zabaikal'ye, the Upper Jurassic folds in the Verkhoyansko-Kolymskiy Kray lie, on the one hand, approximately parallel to the limits of the Sredne-Kolymskaya platform. The boundaries of these two platforms go in different directions from the head-waters of the Kolyma and Indigirka rivers, the first platform running to the South, and the second to the East, therefore the Upper Jurassic folds separate here more freely, taking on a meridional to north-east direction along the Aldansk platform and a latitudional direction along the Sredne-Kolymskaya platform. The direction of folding is sometimes complicated by the presence in the folding zone, of small rigid blocks, either formed in pre-Cambrian time or folded in the Paleozoic. The Kolymskiy Placer region is situated near the edge of the Sredne-Kolymskaya platform, and the tectonics of the sedimentary series in it is, to a significant degree, dependent on this proximity. At the end of the period of Upper Jurassic folding, and probably not simultaneously, various parts of the folded zone were intruded by granites. These Upper Jurassic granitic intrusions, stretching from the Sredne-Kolymskaya to the Verkhoyansk Kray for a distance of over 4000 kilometers caused the appearance of ore presence on all this enormous territory. The metallogeny of the Verkhoyansko-Kolymskiy Kray on the one hand, and the Amurskaya Oblast' and the Zabaikal'ye on the other hand, have much in common. In both areas, commercial deposits of gold, arsenic, lead, zinc and tin are found; in the Zabaikal'ye and in the Amurskaya Oblast' it is known that, in addition, commercial deposits of wolfram and molybdenum occur, these have not yet been found in commercial quantities in the Verkhoyansko-Kolymskiy Kray, but the comparable age of metalliferous matrices permits it to be anticipated that commercial deposits will also be found. The Verkhoyansko-Kolymskiy Kray, like the Zabaikal'ye, cannot be expected to yield large commercial deposits of copper.

Turning to the distribution of gold ore in the Kolymskiy Placer region, we must first of all note that the granites, with which it is associated, lie in a discernible belt within the limits of the Upper Jurassic zone of folding not far from the boundary of the Sredne-Kolymskaya platform. This boundary, dissecting the Kolyma river below the mouth of the Buyunda runs from here towards the north-west, into the basins of the Indigirkaa and Yana rivers, and to the east into the basins of the right tributaries of the Kolyma river. The dependence of the occurrence of granites and the tectonics of the sedimentary series on just this boundary is indicated by the fact that the belt of granitic intrusions and its associated gold presence stretches from the placer region in both these directions. Because of this, I am now inclined to answer in

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the affirmative to the question concerning the possibility of the gold presence continuing eastward from the placer region. Even now there are signs, in the placer region, of a clearly defined belt of gold, which I distinguished as "the main auriferous zone in the Kolymskiy raion". This auriferous zone extends from the lower waters of the Srednikan river westward across the right tributaries of the Urutukan, Utinka, Byuchannakh, and the At-Uryakh. At the present time, it has been explored for 150 kilometers and farther north-west for another 60 kilometers lies the auriferous sector on the upper current of the Debin river. Still farther to the north-west, in the direction of this auriferous belt, there lie:

(1) the stream Kurbelyakh in the Berelekha river system, where local residents say there is gold;

(2) the tributaries of the Nera river on which traces of gold have been found by prospecting parties from the Yakutsk geological-exploration Trust;

(3) the region of Tyubelyakh on the Indigirka river, from where gold has twice been delivered to Yakutsk;

(4) the region of Tas-Khayakhtakh, on the water divide between the Indigirka and the Yana rivers, where gold was discovered by parties from the Yakutsk geological-exploration Trust.

Thus the extent of the main auriferous zone to the north-west from the Srednikan river can be appraised for 850 kilometers. Eastward from the Srednikan however, apart from the very gloomy statements made by Yu. I. Rozenfel'd about the presence of (various commercial minerals), we do not have any indications of gold presence. However, the extension here of the Sredne-Kolymskaya platform delineated by the zone of Upper Jurassic folding is reason to expect that the presence of gold will continue at least to the Omolono-Korkodonskiy water divide, i.e., approximately 400 kilometers east from the Srednikan. In this event the overall length of the main auriferous zone will be about 1,250 kilometers. At the present time the problem concerning the possibility of developing gold production in the confines of the Sredne-Kolymskaya Platform itself remains obscure. It has been proved only by the very superficial explorations done by I.D. Cherskiy, S.V. Obruchev and V.A. Vakkar, on the bais of which it is quite impossible to solve the problem of whether or not the platform remained as an Upper Jurassic, folded, rigid block or whether some of its sectors were suitable for new plicated dislocations conjointly with its over-lying Mesozoic sediments. Equally obscure is the problem of just how

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penetrable it was to the granitic intrusions of that time, and, at the same time, to the associated gold-bearing deposits. In any event, the observations made by S.V. Obruchev indicate that within the confines of this Platform, the rocks of the Triassic and Mesozoic volcanological series lie horizontally in many places. This does not favor the development of Upper Jurassic age, we can at least count on small, purely local, showings. Naturally, those places within the confines of the Platform where the dislocated Paleozoic rocks are not covered over by later Mesozoic sediments, it is theoretically possible to find gold content of Paleozoic age. But, in the first place, granites of Paleozoic age have not been sufficiently reliably identified within the limits of the Verkhoyansko-Kolymskiy Kray, and, in the second place, nowhere in the Far East has auriferous content been associated with Paleozoic granite: It is everywhere associated with wither ancient pre-Cambrian granites or with Upper Jurassic granites or even much younger magmatic formations.

The tectonic structure of the main auriferous zone in the Kolymskiy raion has not yet been studied, and therefore we cannot say anything at this time concerning the regularity of distribution of gold content in it. We only know that it is a large tectonic zone with a whole system of faults that are approximately of the same age as the folding and roughly parallel to them. Both the folds and the flats of the faults are angled slightly upwards to the North, in the diretion of the Sredne-Kolymskaya Platform, i.e., their predominant dip is southward. Some fault systems are replete with auriferous quartzite veins, others have porphyry dikes and albitopheres, dissected by quartzite auriferous veinlets. Just how these systems combine with one another in the overall tectonic auriferous zone and the distribution of granitic blocks is at the present time completely unknown.

South of the main auriferous zone lie separate gold-producing belts and sectors. These include the Bokhapchinsko-Naryginskiy raion, Mandychanskiy, Tyankinskiy, etc. Connected with a more remote appearance of gold content of this same Upper Jurassic folded zone are the Okhotskiy and Dzhugdzhurskiy (Allakh-Yun'skiy) gold-roducing regions. They are situated in the vicinity of the Aldansk platform and are associated with the granites and the tectonics of the surrounding folded zone. Whether or not there is an association between these two branches of gold content, the one surrounding the Sredne-Kolymskaya platform and the other surrounding the Aldansk platform, is entirely unknown becuase of the complete lack of study of the space separating them.

In the vicinity of the Northern Coast of the Sea of Okhotsk and the adjacent part of the Okhotsk-Kolymskiy water divide, the folds of Upper

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Jurassic age become buried under the much younger volcanological series of the Upper Cretaceous Age. Apparently the folded zone did not undergo as much compression here as on the sector confined between the Aldansk and the Sredne-Kolymskaya platforms, and along the edges of these platforms. It therefore probably did not undergo granitic intrusion, and if these intrusions did come, then, due to the lesser compression of this part of the folded zone, it would later have undergone less up-lifting, leaving the granitic intrusions covered over. Later on it was overlain by a thick volcanological bed, it underwent noticeable submergence and, during the Upper Cretaceous time or on the boundary between the Cretaceous and the Paleogene, it underwent new folding. The Upper Jurassic folding in general terms decisively formed the north-eastern end of the Asiatic continent, fuzed the Sredne-Kolymskya and Aldansk Platforms into one and produced young foldings along the periphery. The Zone of Upper Cretaceous folding ran parallel to the boundaries of this newly re-formed continent, taking in nearly all the Northern coast of the Sea of Okhotsk. The Upper Cretaceous folding was accompanied by intrusions of granodiorite. Apparently, this is an echo of the Laramide folding in North America, which was accompanied by intrusions of ore-bearing granodiorite. Although the Okhotsk granodiorites are accompanied by some showing of ore content (pyrite, arseno-pyrite, molybdenite), gold content is apparently not associated with them. Within the area of development of granodiorite of the Okhotsk type, so far only one case of gold discovery has been recorded (on the Nankhatyndzha river between Nagaevo and Yamsk), but this too has apparently turned out to be non-commercial. Furthermore, it has not been determined as to whether or not this gold is genetically associated with the granodiorite or with other rock formations. In any event we can say, with a sufficient degree of accuracy, that the area of development of Upper Cretaceous granodiorite is not a gold producer without running the risk of committing a grave error.

Thus, in spite of the very poor geological study of the Kolymskiy Kray, the regularities in the distributions of gold have already become quite familiar. Future geological and prospecting operations should be organized in accordance with these regularities. The main auriferous zone is already so well defined that no further preliminary considerations are required before organizing detailed operations along its strike on a chart scale of: 100,000. But, since the direction of this auriferous zone in the sector remote from the placer region, particularly in the north-east, has not been accurately determined and it is thought to run there only on the basis of geological suppositions, I consider it necessary to send out two reconnaissance parties, with experienced geologists at their head, to run a traverse geological surveyalong the strike of the auriferous zone in both directions from the placer region, determining its directions from the placer region, determining its direction and repeatedly

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testing it by means of prospecting operations, in order to give proper guidance to subsequent detailed operations. In addition, it is necessary to conduct a thorough geological survey laterally from the placer region, in order to outline those separate auriferous sectors of the Naryginskiy and Tyankinskiy type, which are not spatially associated with the main auriferous zone.

In order to fully disclose the reserves of placer gold in the Kolymskiy raion, survey work should not be confined only to the contemporary valley placers and placers on the lower terraces. The nature of gold-ore deposits and the geomorphology of the Kolymskiy Placer region show that erosion of primary of gold deposits took place very long ago, probably during the Tertiary Age. Many sectors of the placer region have the remains of an ancient peneplain, proving that this region never underwent the extremely long period of disintegration of primary rocks, as a result of which there should have accumulated colossal amounts of friable, rubbly, gold-bearing material. The subsequent elevation of the region, together with the intensified erosion activity, resulted in all this material being reworked by flowing waters. As a result, placers with very large reserves of gold should have formed; in all subsequent erosion cycles the same reserved of gold were basically submitted to rewashing without augmentation by any large new amounts, since after the time of the ancient peneplain there were no more massive massive and deep upheavals of the water divide terrain. The gold that at one time had accumulated on the surface of the ancient peneplain, scattered more and more with each new erosion cycle, producing very rich concentrations in specific sectors. Thus, finding the terrace placers should be of great commercial significance, since the reserves in these sectors, where they are well preserved, should be significantly larger than in the placers of the later erosion cycles. Such well preserved sectors of ancient gold-bearing terraces in the placer region are undoubtedly present, and their identification during geological and prospecting operations deserves appropriate attention.

An extraordinarily important problem in the evaluation of the future of the Kolymskiy auriferous region is that concerning the development of gold-ore deposits. As we have observed, the placer gold deposits in this region have been very widely developed. The question arises, will the gold-ore deposits be equally widely developed? Without doubt. The conditions for the formation of the Kolymskiy placers and the nature of the gold-ore deposits indicates that the preponderant majority of cases will justify the position that, for every commercial placer, it will be possible to find the origin in a commercial mother lode; furthermore, the large the placer reserves, the larger will normally be the mother lode.[1] Therefore, keeping in mind the difficult conditions of ore

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[1] In the initial period of exploration this postulate was correct, but later on it was confirmed less frequently. Editor.

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prospecting in the Kolymskiy raion, we must organize this work only on the basis of fully explored adjacent placers, not on the basis of chance discoveries. The nature of some of the gold-ore deposits is such that they contain isolated rich pockets and samples with visible gold among the lean ore, but generally speaking most of them are not commercial, and, if preliminary placer prospecting is not doen, the result could be a waste of expenditures on ore prospecting for non-commercial sources. Only systematic application of geological exploration and prospecting operations for placer gold and the subsequent conduct of ore exploration and their development into ore prospecting can ensure the methodical discovery of ore deposits.

Insofar as geological survey operations for tin are concerned, and it must be admitted that the Dal'stroy is giving this far too little attention in comparison with the prospects for tin mining the Kolymskiy Raion.

The basic features of the geological structure and ore content of the Kolymskiy Raion are now known. The task before us now is to further our knowledge of the ore content of the region on the basis of sufficiently detailed and carefully carried out geological operation. Unfortunately, most of the work done in the Kolymskiy Raion up to the present time has not been irreproachable in this sense. The reluctance, and sometimes the inability of individual geologists to understand very important details of the geological structure; the chase after the "Wide blue yonder of the Taiga spaces"; the desire to greatly exceed already very high norms, which is always encouraged by the administration, at the cost of attention to work details, has also resulted in the situation that, at the present time, it is necessary to reexplore some of the regions which were worked over only recently. By making an effort to maintain the quality of geological work, to avoid hack-work, to overcome the shortage of geologists may all contribute to putting geological explorations in the right path. If the effort fails, this will all be useless, will be neglected and will give way to purely prospecting methods.

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THE MATALLOGENY OF THE YAKUTSK ASSR[1]

1. The Metalliferous Provinces of Yakutia

Six fairly large metalliferous provinces may be distinguished within the confines of the Yakutskaya ASSR:

(1) The Anabarskaya, with showings of metal content associated with outcroppings of Archean rocks at the base of the Anabarskaya and Aldansk platforms.

(2) Vilyuyskaya, with showings of ore content associated with the intrusion and effusions of traps in the basin of the Vilyuy river and the adjacent regions.

(3) The Aldanskaya, with showings of metal content associated with the syenites and monzonites, intruded in the form of laccoliths, dikes and sills into the Cambrian-Silurian and Jurassic series, and forming the upper structural stage of the Aldansk platform.

(4) Timptono-Olekminskaya (Stanovik region), this takes in the metal-content showings associated with intrusions of Proterozic granites into the crystalline slate series of the Stanovik Range.

(5) Sredne-Kolymskaya is associated with the ancient (Lower Paleozoic or Proterozoic) granites, protruding together with their intrusive metamorphic slates in the basement of the Sredne-Kolymskiy platform.

(6) The Verkhoyanskaya, which takes in an enormous part of North-Eastern Yakutia, ore content showings are associated with the youthful (upper Jurassic to Lower Cretaceous) granites, intruding into the Verkoyanskiy rock series complexes (Upper Carboniferous and Jurassic).

Of the six enumerated provinces, the Anabarskaya is associated with the basement of rigid platforms, the Vilyuyskaya and Aldanskaya are associated with the igneous rocks of their upper-structural stage, the Timptono-Olekminskaya and Verkhoyanskaya with the folded zone surrounding the platforms. The Sredne-Kolymskaya Province, being a typical formation of a folded zone, emerges in the basement of a semi-rigid platform at the present time.

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1 The essay was written in January 1937 and is been published for the first time. Editor

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of the enumerated metalliferous provinces, the Aldanskaya and Verkhoyanskaya are of the greatest practical importance, and are also of great geological interest. The commercial significance of the Timptono-Olekminskaya and the Sredne-Kolymskaya provinces is much less, while that of the Vilyuskaya and the Anabarskaya is very small. Metal content showings, not included in the six enumerated metalliferous provinces of Yakutia, are insignificant and are of practically no importance.[2]

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2 Bilibin gave this description of the metalliferous provinces of Yakutia on the basis of very limited factual information. In spite of this, later on his prognosis was almost completely confirmed although some corrections were made to it. Editor.

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ANABARSKAYA METALLIFEROUS PROVINCE

Metal content showings, associated with out croppings of ancient Archean rocks in the basement of the Aldansk and Anabarskaya platforms, are extremely lean. The best study done on them, together with the Archean rocks themselves, was that by D.S. Korzhinskiy (1933, 1936 subscript 1-2) on the Southern edge of the Aldansk platform. Therefore, it might have been more correct to have called the province the Aldanskaya or Drevne-Aldanskaya, but this would result in confusion with the youthful Aldanskaya metalliferous province, which is of greater importance and more famous. I therefore chose to call it the Anabarskaya province, the more so since the Anabarskiy crystalline block is well known to geologists.

According to D.S. Korzhinskiy, "There are no commercial minerals in the Archean Aldansk platform found to this time" 1936_1 page 65). Of the possible metallic minerals, Korzhinskiy comments only on magnetite. He had found, in beds of crystallized Archean slates, sills of almost pure magnetite up to 1 meter in thickness (1933 page 216; 1936_2 page 66). Veins of pure magnetite up to 1 meter in thickness were found in 1927 by the geologist P.Ya. Drozhzhinyy, from the Aldanzoloto, along the river Bolshoy Yllymakh in the Aldansk auriferous region. The magnetite riches of many Archean rocks lead Korzhinskiy to the conclusion that there probably is commercial quantities of magnetite in the Archean rock of the Aldansk platform. Of the non-metallic minerals, Korzhinskiy bases his consideration on the petrology of the Archean complex of possible discoveries of deposits of phlogopite lazurite, sillimanite, and perhaps, graphite (1936_1 page 66). With reference to non-ferrous metals, Korzhinskiy considers the Archean complex to be completely worthless and only mentions that "It is necessary to test for content of platinide metals (by a study of slimes), and ultrabasic metals, particularly the olivine crystalline schists" (1933, page 210). However, it must be mentioned that in the Southern part of the Aldansk platform, traces of placer gold have occasionally been found in areas where there is much Archean rock present. Thus, it must be borne in mind that it is possible to find insignificant concentrations of gold in association with the Archean rock masses, however, we must exclude the possibility of discovering gold deposits which in any way approach commercial quantity.

Exactly the same petrological character of the Archean complex in the Anabarskaya platform makes it possible to expect that the same commercial minerals will be found here. Traces of placer gold have been detected by means of assaying.

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VILYUYSKAYA METALLIFEROUS PROVINCE

The metal content of the Vilyuyskaya Metalliferous Province is dependent on the regional development of traprocks. Summaries on the petrology and metallogeny of traprocks may be found respectively in the works of V.S. Sobolev (1936 and B.N. Rozhkov 1933). The Vilyuyskaya Metalliferous Province is only a comparatively small part of the enormous area of traprock development within the confines of the Stredne-Siberskaya platform. The periphery of this area is made up mainly of Cambrian-Silurian depositions, and the center is taken up by the Tungusskaya coal-bearing formation, which includes the depositions from the Upper Paleozoic and partially the Mesozoic. According to Sobolev, the lower horizons of the stratigraphic sections are associated exclusively with sill intrusions of traprocks and partially of their dikes, while the upper horizons are associated mainly with effusions. The latter are particularly plentiful in the upper, tufogenic sectors of the Tungusskaya series. Their main area of development is considered by Sobolev (1936) to be the region North of the Nizhnaya Tunguska river. The basins of the Vilyuy, Olenek and Anabar lie in the area of main development of intrusive traprocks.

According to B.N. Rozhkov, four groups of metallic commercial minerals may be distinguished in the areas of traprock development: (1) Copper-nickel-cobalt-platinum Sulphide deposits of the Norilsk type. (2) Polymetallic mineralization. (3) Iron ore deposits of the Angaro-Ilimskiy type. (4) Placer deposits of gold and platinum.

Deposits of the Norilsk type relate to the magmatic-liquation processes and are accumulations of sulphide, either in the form of lenses of pure sulphides, or in the form of dissemination in the intrusive traprocks, mainly near the recumbent side of the intrusion. The sulphides consist of pyrites, chalcopyrites, pentlandite and pyrites with some, and occasionally quite large, content of Platinide group metals. Besides Norilsk, there are several other points on the Western edge of the platform which have mineralization of the same type, although only of minerological interest. Mineralization of this type has not yet been found in Yakutia, but its discovery is quite probable.

The polymetallic hydro-thermal mineralization consists, according to B.N. Rozhkov, of two types: impregnation, pockets and veinlets of sulphides in the contact zones around intrusive traprocks and quartzite-carbonate and zeolitic veins containing sulphide shot. In the first type, the sulphides consist of pyrrhotite and pyrite with an insignificant add mixture of sphalerite, the second type consists of galenite, sphalerite, chalcopyrite and pyrite. The

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second type is confined mainly to the area of development of tufogenic horizons of the Tungusskaya series, i.e., to the central part of the platform. To the present time neither type is of commercial significance. G.E. Frishenfel'd associates the traprocks within the borders of Yakutia with the discovery of galenite near the village of Tit-Ara on the Lena river (1933, page 98) and the accumulation of pyrite, widely distributed in the Mezozoic deposits in the Vilyuy basin (1933 subscript 2, page 55). However, A.G. Rzhonsnitskiy relegates these accumulations to purely concretionary origins: The Iron ore deposits of the Angaro-Yllimskiy are hydro thermal veins and beds of magnetite, achieving great proportions over distances of several kilometers. They all lie within the confines of a broad belt stretching in a NNE direction from the Angaro-Yllimskiy region towards the Chunya, Ilimpeya and the Nizhanaya Tunguska rivers. The Vilyuy river basin remains outside this belt, which, naturally, does not exclude the possibility of discovering similar deposits within Yakutia's borders as well.

The gold and platinum placer deposits are of greatest practical interest at the present time, of all the commercial minerals in the Vilyuyskaya metalliferous province. The placers are mainly of the bar type and lie in the bed of the Vilyuy river itself, on a sector of about 1100 kilometers in length, approximately from the mouth of Akhtyranda river on the West to the city of Vilyuysk on the East (Vysotskiy 1933, page 211). In addition, placers are also known on many of the Vilyuy river tributaries, of which the most practical significance is given to the stream Tongo with its tributaries Dalygyriy and Tabysyngda. Finally, placers are also known along the Namana stream which flows directly into the Lena river. Noble metals were extracted from all the enumerated streams and to a small extent this practice continues today.

As sources of gold and platinum for these placers, all investigators unanimously named the widely occurring Jurassic conglomerates, which in their own turn accumulated the metals from various sources. V.A. Obrychev considers that the bulk of the gold was brought in during Jurassic time from the Lena auriferous region (Patomskoye Nagor'ye). Most of the investigators agree with this, but some of the, including N.K. Vysotskiy, consider that a small amount of gold was associated with the traprocks. The traprocks are undoubtedly the primary sources of platinum. The occurrence of gold and platinum in the area of development of Jurassic conglomerates is in full agreement with this. Platinum is absent from the Namana stream: In the Eastern part of the Vilyuy basin it amounts to only a small admixture in the gold. Moving Westward and North-Westward along the upper waters of the Vilyuy, the relative content of platinum increases up to 20 and 25% and more (Vysotskiy 1933, page 225). The platinum mother-lodes have not been discovered to this day. V.S. Sobolev (1936, page 156) rejects the association of both gold and platinum with traprocks, which naturally is unbelievable.

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The Vilyuyskaya Metalliferous Province has as yet been very poorly studied from a geological point of view, not only new commercial areas of placers may be discovered in the future, but also commercial sectors of Jurassic conglomerates and perhaps even mother lodes of platinum.

ALDANSKAYA METALLIFEROUS PROVINCE

The Aldanskaya Metalliferous province is of enormous practical significance. Suffice it to say, that it contains the largest mining region in Yakutia, the Aldan auriferous region. In addition, this province includes the auriferous regions of Tyrkandinskiy, Uchurskiy, Verkhne-Amginskiy, Khatyminskiy and Lamamskiy. Of these the first two have been explored to a considerable extent (even though far from completely) and are being developed at the present time; exploration of the Verkhne-Amginskiy region was begun in 1936; the Khatyminskiy region has been done and the Lamanskiy has not even been geologically surveyed. All these regions are situated in two belts in a roughly latitudinal direction along the southern edge of the Aldansk platform, from the Olekma river on the West to the Maymakan river on the East. The Southern belt includes only the regions Khatyminskiy and Lamamskiy, all the remainder are in the Northern belt. Of these, the most typical and the best known and the richest is the Aldan auriferous region, and we shall confine ourselves mainly to a description of this region.

The geological situation here is simple. On an abraded surface of Archean complex lies a slightly Northward tilting (1 or 2 degrees) bed of Cambrian limestones and marls of 250 to 300 meters thickness. They are overlane by limnetic sandstones of the Jurassic Age and with layers and horizons of clay shales of a total thickness of 400 to 450 meters. The region is broken up by large faults into a number of blocks, some of which have been raised and others lowered. The amplitude of displacement reaches 300 to 600 meters. The sedimentary conglomerates are intruded by sills, laccoliths, and dikes, of syenites and syenites-porphyries, pyroxenites, shonkinites, limburgites, leucitites, nephelinite and leucitite-syenites, aegirinite granites etc. The ore content of the region is associated with the intrusions of these rocks.

The sequence of intrusions by rocks of various compositions has not yet been reliably established. According to the data available at the present time it is in the following form:

(1) Intrusion of sills of biotite porphyries, quartzfree and quartzose porphyries.

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(2) Laccoliths of pseudo-leucite syenite with margin and dike facies, represented by pseudo-leucite porphyries and pseudo-leucite tinguaites.

(3) Limburgite, augitite and leucite dikes. Quite possibly, at the same time dikes or pyroxenites, peridotites, and shonkinites were formed.

(4) Laccoliths and stocks of augitite syenites, part of the augitite syenite is of more ancient origin, than the pseudo-leucite syenites.

(5) Laccoliths and stocks of alkaline, sometimes aegirine syenites.

(6) Dikes of nephelinite syenites, solvsbergite, grorudite and tinguaites.

(7) Hydrothermal ore-beds and veins.

All the enumerated rocks, like the rock formations, are of post-Jurassic age. From the point of view of mineralization, all these rocks can be described in the following manner:

(1) Sill intrusions were exceptionally inactive. They are sometimes associated with silicification of limestones in direct contact, accompanied by weak pyritization. Occasionally, some skarn is observed in the limestones (tremolite) and formation of fine magnetite shot.

(2) Mineralization has not been confirmed for the pseudo-leucite.

(3) Dikes of limburgites, peridotites, and possibly other basic rocks contain a fine admixture of pyrrhotite, pentlandite and chromite. Quite probably, they are associated with traces of platinum and iridosmium encountered in the Aldan placers.

(4) Augitite syenite laccoliths bring about great contact metamorphic changes in the intruded limestones, causing the formation of the most varied skarns: these include micaceous skarns, tremolites, actinolites, pyroxenites, granatites, scapolites, humites, chondrodites and others. Sometimes, fluorite is also present. Magnetite is very characteristic of the ore minerals, and frequently forms quite large accumulations. Pyrite, chalcopyrite, irion glance, galenite, sphalerite

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sheelite, and molybdenite occur in lesser quantities. Sometimes these contact formations are divided up by an irregular network of high temperature quartzite veinlets with pyrite, sometimes chalcopyrite and traces of gold.

The pre-contact zone of the syenites themselves occasionally contains quartzite veinlets with a small quantity of sheelite and gold, as well as voldtilization of molybdenite along the joints.

Because of the insignificant amount of valuable metals in these formations, they are not of commercial interest at the present time. Gold content appears in traces, occasionally reaching one or two grams per ton. There is not a single commercial placer, formed as a result of the destruction of mineralized contact zones, known in the region. Perhaps some sectors of the contact zones will be of interest from the point of view of the sheelite present in them.

(5) Stocks of alkaline syenites contain, in their peripheral sectors, small, auriferous quartzite-pyrite and quartzite-fluorite veinlets. Commercial mother-lodes of this type have not been found, but in the course of their destruction they have produced poor, but commercial, alluvial placers. It is occasionally observed that the quartzite veinlets and veins pass from beyond the limits of the alkaline syenites into the cover, which is composed normally of Jurassic sandstones. Here, on a background of extremely poor gold content, expressed in traces or one or two grams per ton, there are found rare, small pockets of very high content and with a large quantity of visible gold. In spite of this, on the whole these veins are not commercial and did not form commercial concentrations in placers during the course of their destruction.

The possibility is not discounted that gold-bearing veinlets in the syenites and in the cover are associated not only with the alkaline, but also with some types of earlier augitite syenites. Field observations are not available on this matter.

(6) Ore formations have not been established in connection with the nephelinite syenites and their accompanying rocks.

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(7) The hydrothermal activity taking place in the region at the end of the period of intrusion produced the main ore deposits of this region. The latter are associated with crystalization of the deep-lying magmatic hearth, out of which oozed the magma during the course of the whole period of magmatic activity. For these reasons the ore deposits of the region, by their distribution over its area, show an association which is not so much with separate intrusive bodies, as much as it is with the tectonics of the region. All the ore deposits of this type can be divided into two large groups:

A. Hydrothermal veins (Fissure occupation).

B. Metasomatic deposits in limestones.

Each of these groups can be further subdivided according to indications of mineral composition. The following veins may be distinguished:

(a) Quartzo-magnetite veins, which are found fairly rarely; auriferous veins have not yet been found among them.

(b) Quartzo-hematite veins are very common: they frequently contain commercial quatities of gold; they sometimes show a banded structure. Beside hematite (iron glance) they contain a considerable amount of pyrite, and sometimes a small amount of chalcopyrite and galenite. There seems to be a tendency towards increased quantity of sulphides with depth at the expense of hematite.

(c) Quartzo-sulphide veins are even more common. The gold content goes from non-commercial to very rich. Chalcopyrite and pyrite are predominant among the sulphides, a small admixture of galenite and an insignificant amount of bismuthine is common. The chalcopyrite ores are particularly rich in gold.

Besides the above mentioned minerals, in places where hydrothermic veins have been developed and in the slicks of placers there very often occurs sheelite and sometimes silver nuggets. Neither sheelite nor silver have been found in the ore veins themselves up to this time.

Among the metasomatic deposits in limestones the following are observed:

(a) Sectors of silicified and quartzized limestones (jasperoid).

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Ordinarily they are weakly pyritized, they sometimes contain sparse, fine separations of fluorite and what appears to be barite. They frequently show traces of gold; individual samples are exceptionally rich. Their commercial value is obscure.

(b) Metasomatic sill deposits of siderite. These lie in the limestone beds horizontally or at an insignificant angle. The lens-shaped ones extent for hundreds of meters in length. They are faintly pyritized, and occasionally contain visible gold. They are ordinarily oxygenated into a ochreous ore. They are a fully commercial gold ore deposit.

(c) Metasomatic sulphide sill deposits. These are analogous to the foregoing in form and conditions of occurrence. Pyrite predominates among the sulphides, sometimes there is much chalcopyrite. Galenite and an insignificant admixture of sphalerite occur sporadically. The various sulphides occur in a layered distribution. Normally the deposits, with the exception of the galenite layers, are oxidized to limonite with only traces of the primary sulphides. Purely pyritic deposits sometimes contain very little gold; deposits with a noticeable admixture of chalcopyrite are always commercial.

(d) Metasomatic quartzo-hematite deposits, inseparably associated with quartzo-hematite veins and are analogical to them in composition.

Some metasomatic ore deposits are completely independent ore bodies and are not associated with any underlying ore veins. In any event, the latter were not found during exploration and development of these deposits. Others are inseparably bound to ore veins and are nothing more than laminated bulges in limestones under intrusive porphyry sills. Of the heretofore known metasomatic deposits, the siderites apply exclusively to the first type, quartzo-hematites to the second type, and sulphides to both types.

All the heretofore known deposits are localized in the lower hundred meters of the Cambrian limestone beds. They are all strongly oxygenated, and since the base for circulation of ground waters was the abraded surface of the pre-Cambrian, it is hardly possible to expect to find primary, unoxygenated deposits above it, with the exception of separate small sectors. Entering the Archean layers, the ore veins lean-out and some of them become unprofitable.

However, there is reason to believe that some of the veins in the Archean beds will remain profitable.

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Insofar as the relative commercial value of veins and metasomatic deposits is concerned, the role of the latter in the auriferous region is undoubtedly greater. On the basis of preliminary estimates, I am inclined to evaluate this ratio at 1:3 in favor of metasomatic deposits.

The famous, alluvial, auriferous placers of the Aldanskiy raion formed as a result of a prolonged process of destruction of the gold ore deposits. In other auriferous regions of this metalliferous province, only placer gold deposits are known up the present time. The common geological conditions justify the expectation that in the other regions the ore deposits will be of the same type as those in the Aldan. By the way, in the Tyrkandinskiy and Uchurskiy raions, there are indications of a special type of ore formation, these are auriferous pyritized syenite-porphyries and diorite-porphyries. It is quite possible that deposits will be found which are of the same general type, but with a somewhat different character of mineralization, for example, they may be essentially argentic-plumbic ores.

The Aldanskaya metalliferous province is entirely without peer in the Soviet Union. Of the world fields, a fairly close analogy can be found in the petrological and metalliferous provinces in the West of the North-American platform near its border with the Rocky Mountains (Montana, South Dakota and others).

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TIMPTONO-OLEKMINSKAYA METALLIFEROUS PROVINCE

This province lies directly South of the Aldansk platform, in the region of the Stanovik Range, and takes in the auriferous regions of the Kabatanskiy, Verkhne-Timptonskiy, Sutamskiy (Staro-Aldanskiy, within the borders of Yakutia, and the Nyukkhinskiy, Larbinskiy, Dzheltudakskiy, Verkhne-Zeyskiy and the Lantarskiy directly South but outside the borders of Yakutia). The gold content here is associated, according to data supplied by D.S. Korzhinskiy, with intrusions of Proterozoic (ancient-stanovite) granites into a bed of crystalline, pre-Cambrian slates. The latter, under the influence of the contact action of granites, were converted to on the one hand, muscovite gneisses, and on the other hand into "gneissoids": sericitic chloritic, epidotic, actinolitic epigneisses and slates (Korzhinskiy, 1936$_2$, page 194-195). The zones of these methamorphosed rocks are more or less extended lenses, extending in conformity with the general strike of folding, tapering in both directions and varying from an insignificant width up to 16 kilometers. According to Korzhinskiy, gold content is associated with both types of converted rocks. Immediate gold carriers are, in Korzhinskiy's opinion, partially the gneissoids themselves and partly the auriferous quartzite lenses, which "because of their insignificant size (up to 0.25 meters in thickness) do not offer any prospects for commercial mother lodes to be found" (Korzhinskiy, 1938, page 211). One need not agree with this last conclusion, which was made on the basis of chance discoveries. According to N.I. Zaytsev, besides purely gold-bearing quartzite veins, this metalliferous province has quartzo-pyritic and quartzo-chalcopyritic veins but the gold content of these has not yet been established.

We cannot discount the possibility of a continuation of gold content of this type in a North-Westerly direction in the basin of the Olekma river and on the headwaters of the Tokko river. The already known auriferious regions in the Timptono-Olekminskaya metalliferous province contain many commercial and sometimes very rich placer deposits of gold. However, their resources are much more modest than that of the Aldanskaya metalliferous province.

The ratio of total placer gold resources between these two provinces can be approximated at 1: (4-5) in favor of the Aldanskaya province.

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SREDNE-KOLYMSKAYA METALLIFEROUS PROVINCE

This province has been very poorly studied. Dal'stroy operations have established that there are gold placer deposits and copper ores. At the present time, deposits are being surveyed. Ore content showings are associated with intrusion of ancient Cambrian and/or Proterozoic Age granites into the metamorphosed slate series, emerging in the basement of the Sredne-Kolymskaya platform. Metal content showings have been found only within a small part of this semi-rigid platform on the middle current of the Kolyma river. Widespread development of metal content is not indicated, since the basement rocks on large areas are overlain by younger formations, and the size of the platform itself is comparatively small.

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VERKHOYANSKAYA METALLIFEROUS PROVINCE

On the whole, this metalliferous province, in spite of its far from complete stage of study, is foremost in practical significance, surpassing even the Aldanskaya province. However, the richest ore producer, the Kolymskiy raion, lies beyond the borders of Yakutia to the east. Nevertheless, that part of the province which does lie within Yakutia is of enormous practical interest and, probably, surpasses the whole Aldanskaya metalliferous province in this sense. The Verkhoyanskaya metalliferous province is associated with the region of distribution of Upper Mesozoic (Upper Jurassic and Lower Cretaceous) granites and granodiorites, intruding into the bed of the so-called Verkhoyansk complex. The latter includes deposits from the Upper Carboniferous to the Jurassic inclusive, and is a very characteristic bed of sharply predominating sandstones and slates with a subsidiary amount of tufogenic rocks and local effusions. In contrast to the essentially calcareous Caledonian-Hercynian complex of this region, limestones and marls are virtually absent in the Verkhoyansk complex. The Verkhoyanskaya metalliferous province stretches from the Arctic Coast in the region East of the mouth of the Lena river (the Khara-Ulakh and the Kular Mountains) in a direction southward across the whole of the Yana river basin. It takes in the following Khrebets: the Orulgan, the Verkhoyansk and the Tas-Khayakhtakh and, turning abruptly, it follows along the northern edge of the Aldansk platform and emerges on one side towards the East in the basin of the upper current of the Indigirka river, and on the other side to the south on the headwaters of the right tributaries of the Aldan river. East of the Indigirka river, having crossed the basin of the Kolyma river, this province now emerges within the boundaries of Yakutia. Its southern branch again takes in the upper and middle currents of the rivers Tara, Khalyya, Allakh-Yun', Yudoma and the Maya, where it once again emerges within the boundaries of Yakutia.

It is characteristic of the whole Verkhoyanskaya metalliferous province that two main types of mineralization appear in it: essentially auriferous and auriferous-arsenious, and on the other hand, stannous-polymetallic. Each of these types produces independent deposits. Mixed deposits occur very rarely. The regions showing one or another type of mineralization are normally quite distinct. It is true that occasionally they both occur in the same region, but such co-occurrence is not a regularity and, in all probability, it is associated with different phases of intrusion.

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Gold mineralization has a clearly expressed linear or banded distribution (Bilibin, 1935). Within the borders of the Verkhoyanskaya folded zone, in proximity to its boundaries with the folds of the calcareous Caledonian-Hercynian complex, and bordering on the Aldansk and Sredne-Kolymskaya platforms, lie the two main auriferous zones of Allakh-Yunskiy and the Kolymskiy, stretching generally parallel to the boundaries of both complexes. In addition, auriferous belts of considerably lesser extent are detectable in the central parts of the folded zone. The regularity of their occurrence in the transverse profile or the folded zone has not yet been established.

The Allakh-Yunskiy regional auriferous zone begins in the south, somewhere in the basin of the left tributaries of the Maya river. Farther north it dissects the Maya river on its upper current, the Yudoma on its middle current and runs into the basin of the Allakh-Yun' river. It runs for 150 kilometers along this basin, then it leaves it and runs northward in the basins of the rivers Belaya, Khalyya Tyry, and the Khandyga. Geological-reconnoitering and partially exploration operations have been carried on over approximately 250 kilometers from the Yudoma river to the Khalyya up to this time. I am inclined to estimate its actual length at no less that 500 kilometers. This auriferous zone is being established on the basis of the presence of almost exclusively placer gold. The latter is distributed along its length non-uniformally, in individual enriched nodes, alternating with much leaner sectors. These enriched nodes lie on the average of 50 kilometers apart.

Gold-ore deposits within this zone are known only from lone finds or lone discoveries to this time. They consists of very irregular quartzite veins and veinlets, buried in clay shales and containing, besides gold, a small quantity of pyrite and grey ores with an insignificant amount of other sulphides. Generally speaking, the Allakh-Yunskiy auriferous zone is very rich in quartzite veins of the most varied morphological types (belts of veinlets, veins, lenses, saddled shaped veins etc.). They are all comparatively lean in sulphides and refer to the mesothermal type. Of the sulphides, pyrite predominates, there are significantly less quantities of galenite, sphalerite, chalcopyrite, arsenopyrite and grey ores. Most of these veins are not auriferous.

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There is a noticeable tendency towards a change in the mineralization in the northern parts of the Allakh-Yunskiy auriferous zone, in the basins of the Tyry and Khandyga rivers. Here, cuprous-syderite and some polymetallic veins appear. In this same zone, apparently, occur a unique orpiment deposit along the Menkyula stream in the Tompo river basin. The auriferous zone itself can be expected to extend at least to the basin of Khandyga river. Here the folds of the Caledonian-Hercynian complex turn sharply to the northwest and soon disappears undergound. At the same time there is a distinct change in the nature of mineralization within the Verkhoyansk complex: the auriferous mineralization is replaced by stannous-polymetallic mineralization. Farther to the northwest, in the Orulganskiy Khrebet and the Khara-Ulakh Mountains, the folds of the Caledonian-Hercynian complex come out on the surface in places, but, apparently, the zone of contact between the two complexes is not uncovered sufficiently far in the Verkhoyansk complex to show the gold mineralization. Incidently, traces of placer gold have been found here and, possibly, more careful exploration will discover commercial concentrations.

The Kolymskiy auriferous zone is one of the largest both in size and in amount of gold present. It extends from the right tributary of the Kolyma, the Srednikan river on the one hand northwestwards across the rivers Urutkah, Utinaya, Khatynnakh, Debin, Berelekh in the basin of the right tributary of the Indigirka river, this is the Nera river, on the other hand it stretches northeastwards, into the basins of the rivers Buyunda and Balygychan. On the north western extension of this zone lies the Tostakh river in the basin of the Yana, where placer gold has also been found. As early as 1934, when geological prospecting operations had covered a belt of stretching for only 150 kilometers, I made a rough estimate of its length to be 1250 kilometers (this prognosis was later very clearly confirmed). At the present time geological reconnoitering parties have explored a sector of the auriferous zone measuring 750 kilometers in length, of which a comparatively small part lies in the Nera river basin i.e. it is situated within the boundaries of Yakutia. At the moment there is no basis for amending the figures given by me, and it is to be expected that further extension of its length beyond 750 kilometers will lie mainly in the boundaries of Yakutia, along the left bank of the Indigirka and in the Yana river basin. Since the Yakutia sector of the Kolymskiy auriferous zone has been very poorly studied, a description of the latter would have to be based mainly on observations made in the Kolyma river basin.

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There are two main types of gold ore deposits distinguished within the boundaries of the Kolymskiy auriferous zone: quartzite veins in sedimentary series and systems of irregular quartzite veinlets in porphyry dikes, albitized porphyries etc.. Quite probably, these types are not so much genetic as they are morphological. Both the veins and the sedimentary series, as well as the veinlets in the porphyry dikes are, apparently, younger than the granites, whereas the porphyry dikes themselves are older than the granites and have been metamorphozed by them. Thus, if in the future it will not be established that the granites metamorphozed the gold mineralization as well (which is quite possible), then it must be considered that the dikes are not genetically associated with the mineralization and are of importance only as intrusive rock. The porphyry dikes are distributed through the region as separated series, extending from tens of kilometers in length and a few kilometers in width. In the intervals between the series the dikes are completely absent. Wherever dikes were formed, gold mineralization is localized in them, and the quartzite veins in the sedimentary rocks are nearly barren of gold; where the dikes are absent, the quartzite veins are also gold bearing. Thus, it appears that dikes were the most favorable route for penetration of gold bearing solutions.

It is to be noted that the series of porphyry dikes are confined mainly (but not always) to those sectors where the sedimentary rocks have a northwesterly strike (310 to 325 degrees). Where the strike is inclined more to the West (270 to 290 degrees), the dikes normally (but not always) are absent and the quartz veins are auriferous. Thus, the sectors of one and another strike alternate along the length of the folded zone across specific intevals, and this determines the structure of the auriferous belt: auriferous quartzite veins and porphyry dikes alternate along its strike with auriferous quartzite veinlets. Occasionally they scatter somewhat over the width of the auriferous belt, alternating with one another in a chessboard fashion.

From the point of view of mineralization, the porphyry dikes are somewhat more varied than the quartzite veins. The latter, in addition to quartz, contain small admixtures of carbonates and, sporadically, grains of orthoclase. Of the ore minerals, gold is common, as is arsenopyrite and pyrite, an insignificant amount of galenite, sphalerite, chalcopyrite, and some phrrhotite are also found. The veinlets dissecting the porphyry dikes consists mainly of quartz, and sometimes with a large admixture of carbonates (calcite, ankerite, occasionally siderite), albite and chlorite. The ore minerals are the same as those in the quartzite veins, with an admixture of scheelite, poorly defined sulphatimonite of lead (literally boulangerite) and some antimonite. Phrrhotite sometimes occurs in fairly large quantities, but is generally never found together with boulangerite. The phrrhotine-bearing ores related to a lower horizon which is leaner in gold. The presence of boulangerite is a good indication of gold mineralization.

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The intruding porphyry dikes were submitted, in connection with mineralization, to albitization (besides the earlier autometamorphism) calcitization, sericitization, and sometimes to chloritization, quartization and impregnation by sulphides. Mineralization for both the porphyry dikes and the quartzite veins remains of the mesothermal type. Associated with both types of deposits are the rich placers for which the region is famous. The commonality of geological conditions makes it possible to predict that within the boundaries of Yakutia the main auriferous zone will have the same type of gold ore deposits.

Besides the main, local auriferous belt, the Kolyma basin is known to have secondary auriferous zones, which are localized nearer to the central parts of the Verkhoyansk folded zone. These include the auriferous presence on the rivers Bokhapcha, Tyan'ka, Kula, Emtegey and others. All these sectors have been studied significantly less, but quite probably they will be characterized by the same types of gold ore deposits. In Yakutia, such subsidiary auriferous belts in the center of the folded zone have not yet been found.[1]

The stannous-polymetallic mineralization in Yakutia is best represented in the Western Verkhoyansk range. An exhaustive description of it is given by S.S. Smirnov (1934). The manifestation of ore presence here is associated with the Upper Mesozoic granitic intrusions, only recently these denudations have begun to show and in many instances they have not yet been uncovered. Such denuded granite blocks appear on the surface as hornfels fields, laceworks of granite-porphyry veins and aureoles of polymetallic mineralization. The deposits themselves are quartzite, quartzite-siderite and siderite ore veins. These two minerals, quartz and siderite, are considered by Smirnov to be specifically characteristic of the Western Verkhoyan'ye.

Most of the deposits are of silver-lead-zinc nature. Secondary developments include deposits of copper, copper-arsenic, lead-zinc-arsenic, tin etc. The leading metal deposits, according to Smirnov, are iron, silver, lead, zinc, arsenic, copper, antimony, tin; secondary metals are; manganese, molybdenum, wolfram, and bismuth. It is characteristic that the content of tin and silver is increased and the gold content is insignificant. The ore minerals of the deposits are extraordinarily varied. Smirnov considers widely distributed minerals to the pyrite, sphalerite, pyrrhotite, arsenopyrite, galenite, chalcopyrite, those with medium distribution he considers to be grey ore, casserite, molybdenite, burkonite, boulangerite

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1 They have been found at the present time. Editor

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and, finally those which are rare and very rare are bismuthin, wolframite, scheelite, hematite, argenite, pyrargyrite, stannite, ferberite, bornite, enargite, and wurtzite. The deposits are of the mesothermal type. The most characteristic metamorphism in the side rocks around veins are sericitization, silicification, sulphidization (Smirnov 1934). The same type of deposits are found, as was mentioned earlier, in the Eastern Verkhoyan'ye, as well as on the Orulganskiy and Bezymyannyy ranges. Non-commercial quantities of casserite and galenite were found on the upper current of the Yudoma river.

All the stannous-polymetallic deposits of the Western and Eastern Verkhoyan'ye are the upper horizons of the same metallized zones, to whose deeper horizons the Allakh-Yun'skiy auriferous belt is related. It is very characteristic that in the entire metallized zone, the gold content in it shows a clearly defined banded distribution, depending more on the tectonics of the region than on the individual granitic blocks. At the same time the stannous-polymetallic deposits very clearly show a group (central) distribution and gravitation towards individual granitic blocks. It is interesting to note that in the Kolyma river basin, both in the main auriferous zone and outside of it, stannous and polymetallic deposits are known. They show exactly the same group distribution and gravitation towards specific granitic blocks. At the same time the gold deposits, as in the Allakh-Yun'skiy region, show a banded distribution, very clearly defined association with the tectonics and a fairly clearly expressed independence of the granitic blocks. All this can be accounted for by the fact that the Kolymskiy raion stannous-polymetallic deposits are associated with much later phases of granitic intrusion, than is the main gold mineralization.

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CONCLUSION

The foregoing was a short description of the six main metalliferous provinces in Yakutia and the main occurrences of metal content within its boundaries have been indicated. Outside these provinces there are only isolated showings of metal content, which are of no great importance. For example D.S. Korzhinskiy commented on a stock of strongly pyrrhotite monzonite in the Verkhne-Timptonskiy raion, along the Iengra stream at the mouth of the Staro-Nezametnyy brook; obviously, showings of placer gold observed in this area are associated with this stock (Korzhinskiy, 1933, p. 214). If this monzonite does not refer to the Aldansk type rocks, then it is most correct to refer it, according to D.S. Korzhinskiy, to the metallized intrusions of the Zabaykalo-Amurskaya metalliferous province. Within the gabbrodiabases of the foled Caledonian-Hercynian complex, surrounding the Aldansk platform from the East, one occasionally observes shot content of pyrrhotite and pentlandite with accumulations of titanomagnetite, which are of no practical significance. All such sporadic appearances of metal content do not deserve any detailed enumeration whatsoever.

In summarizing the nature of the six main metalliferous provinces, we can follow the changes in the character of mineralization from the most ancient to the youngest formations, and at the same time from the deepest zones to those nearest the surface:

Archean	Traces of gold. Magnetite.
Proterozoic	Gold
Cambrian	(or Proterozoic). Gold. Copper
Mesozoic	Gold. Tin. Polymetals.

Thus, gold is the most characteristic metal in Yakutia, traceable from the Archean to the Mesozoic and from the deepest to the most superficial horizons of mineralization. All the other metals are distributed in accordance with their usual genetic peculiarities. It should be emphasized that tin, which is shown for a higher temperature property on the Emmons Scale than gold, is associated with the higher horizons. The Emmons Scale takes into account only the temperature factor, and does not pay attention to the factor of depth, which is far from being one and the same thing. Gold is localized in an exceptionally broad diapson of depths and a much narrower diapson of temperature, tin is confined to a fairly narrow diapson of depths and to a slightly wider diapson of temperature. Gold, most probably, never forms in conditions of such high temperature as does the main mass of tin, but tin, in its turn, is natural to higher zones than is the main mass of gold.

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THE GEOLOGY OF PLACERS IN THE FAR EAST AND IN YAKUTIA[1]

The Geology of placer deposits in each region is determined mainly by the history of its geological development in the Cenozoic age, while for some regions, as, for example, the Urals where there are placers of Mesozoic age, the Mesozoic geological development is also a factor. The clearest and most easily observable index of these useful Meso-Cenozoic geological precesses is the relief in each of the given regions, therefore geomorphological study of placer deposits.

In this sense our Far East and Yakutia are in a very unfavorable position, since their Cenozoic history and their geomorphology have so far been studied very poorly. True, individual sectors of these regions have been fairly well explored, but they are very fragmentary and cannot characterize the region as a whole. General summaries for each region which would unite these investigations have not been composed and, frequently, observations made in different sectors are difficult to reconcile. The situation is complicated still further by the fact that even the available fragmentary data are very little used for geological identification of placer-type deposits, which for the main part remain completely unstudied.

It is therefore not surprising that our knowledge of the geology of the placers in the Far East and Yakutia is still more fragmentary, and it is very difficult to give a general geological description at this time. Below, I make an attempt to approach the geological regionality of this extensive district from the point of view of placer deposits and to indicate the main points in the geological characterization of placers in the various provinces.

According to its geological development during the Cenozoic, and the close association of placer deposits with this Age, the Far East and Yakutia can be divided into three main placer provinces: the Dzhygdzhurskaya, Aldanskaya and the Priamurskaya. Of these, the Aldanskaya province is distinguished by the most stable and uniform nature of placer deposits. In the Dzhygdzhurskaya province the geomorphological situation changes very gradually, but in sum total it shows a fairly significant tendency in the North to South direction, and also a gradual but quite essential change in the nature of these changes makes it more difficult to identify the smaller

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geomorphological units in this province. Insofar as the Priamurskaya province is concerned, the history of its geological development during the Cenozoic in comparison with geomorphological situation and the nature of placers, divides into a number of separate, smaller and fairly diversified sectors which is its characteristic peculiarity. We shall begin our description with the most remote province, the Dzhygdzurskaya.

DZHUGDZHURSKAYA PLACER PROVINCE

The outstanding feature of the Dzhugdzhurskaya placer province is that it is a zone of youthful Upper Mesozoic folds. In close association with this at the end of the Mesozoic and the entire Cenozoic periods this area experienced continual and significant billowing, and naturally divided into a number of individual uplifts separated in time. Each uplift was a lowering of the erosion base and was accompanied by renewal of erosion activity, the development of new erosion cycles and the production of a new erosion level. The second feature of the Dzhugdzhurskaya placer province is that it is composed of mainly terrigenous deposits of the Verkhoyansk complex, and mainly of soft argillaceous and argillo-arenaceous shale which are easily eroded by water. Therefore, the production of new erosion levels in connection with lowering of the erosion base proceeded here quite easily, and each erosion cycle corresponds to its own erosion level. Prolonged billowing in this region led to the formation of a semi-mountainous relief on the whole area, and in many sectors it changes into typical high mountains. In association with this, the region was repeatedly subjected to glaciation during the Quarternary period.

Thus, the distinguishing features of the Dzhugdzhurskaya province are: relation to the zone of useful folding, intensive billowing, unique lithology, numerous erosions cycles and erosion levels and repeated Quarternary glaciation. These distinguishing features in themselves indicate the main markers in the Cenozoic history of the province, by which we can construct the stratigraphy of the friable deposits and the age distribution of the placers. These are the separate erosion levels and periods of Quaternary glaciation.

There is no one opinion on the number of Quaternary glaciations in the Dzhugdzhurskaya province: some think they were two, others say they were three periods of glaciation. I consider that the province

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underwent a triple glaciation: the first glaciation was of the covering type, it began at a height of about 350 meters and above the present erosion level, the second glaciation was of the valley type at a height of 170 to 200 meters above the present level and the third, also a valley glaciation, was at the present or near to the present level. Distinct glaciation forms of relief associated with the first period of glaciation have not been found; it is possible that the reason is they have not been given special study. Glacial deposits of the first glaciation are marked by large, erratic boulders, distributed along the water divides right down to altitudes of 1150 meters (550 meters above the present level of the Allakh-Yun' river), and bouldery-gravel deposits, normally mixed; in some saddles apparently remaining in situ. The height of occurrence of the erratic boulders on the most prominent elevations in the region, higher than the general level of the water divide elevations, indicates the covering nature of the glaciation.

The second glaciation, which was of the valley type, left very clear glaciation forms of relief in the guise of broad trough-like valleys into which, in many places, younger troughs of the subsequent, third glaciation were cut-in to depths of 170 to 200 meters. In places at the foot of high mountain granitic massifs the level of trough valleys of the second glaciation blends into a single platform-like surface covered by depositions of glacial rubble. The inter-glacial run-off gullies apparently did not reach here, and the third glaciation obviously took place here at the same level has did the second. On all remaining areas of the region the third glaciation took place at the present or nearly at the present level (ground morain deposits have been eroded by contemporary water currents for depths of from a few meters to 20 meters of its surface), and left exceptionally clear traces in the shape of destructive and accumulative forms of relief and a variety of glacial deposits (sinks, troughs, rock bars, scouring basins, ground, medial and terminal moraines, innumerable glacial lakes formed by scouring, fluvioglacial and lacustrine deposits etc.).

The exceptionally varied geomorphology of the region was not fully reflected in the gelogical features of the placer deposits because of the fact that the gold deposits of the region are localized within the confines of a very narrow belt running in a meridional direction (the main auriferous belt of the region) and their features could therefore only reflect the significantly less varied geomorphological conditions which occurred in the confines of the narrow belt. Placer from the pre-glacial, the first inter-glacial period and the two first glacial

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epochs are not known in the region, probably, because their discovery was not given due attention. All the known placers in the region correspond to the second inter-glacial epoch or to the post-glacial period. In connection with this, the post-glacial placers are exclusively either valley or stream bed placers, whereas the inter-glacial placers are valley or terrace (bench) placers at low levels. Inter-glacial bench placers at high levels are practically unknown in the region.

There is a zone of glacial scouring dating to the period of last lgaciation on the upper parts of the river valleys, near the area of glacial feeding. Here, the inter-glacial depositions are completely or nearly completely removed by glaciers, and the valley bottoms are frequently covered with a complicated mass of basic argillaceous shales the intervals between which are marked by moraine deposits. Even in those cases where the valley floor is completely covered with friable (moraine) glacial deposits, there is no hope of finding commercial inter-glacial placers beneath them since they were completely or almost completely scoured out and the moraine deposits lie directly on the primary rocks. In the Suncha river valley, lying in the zone of glacial scouring, prospecting operations among the predominently moraine material turned up only separated small traces of gold content in the inter glacial alluvium. Fortunately the main auriferous belt of the region lies outside the limits of the zone of glacial scouring, and the main placer deposits of the region were not touched by the glacier. However, the possibility must not be overlooked that the greatest part of the main auriferous belt of the region and the distinctness of its boundaries were partly conditioned by the fact that the eastern side of a considerable part of its length was bounded by the area of glacial scouring.

The placer deposits of the main auriferous belt lie in the boundaries of the area of glacial deposition, where the inter glacial placers were not directly affected by the glacier, but were covered over by beds of ground moraines or other friable formations that are geneticly associated with glaciation. On the right tributary of the Allakh-Yun'ye river, the Evkandzha, a deep inter-glacial placer is being worked which had been buried by a ground moraine. Many of the right tributaries of the Allakh-Yun'ye river were dammed by the glaciers, and this formed lacustrine basins, in which thick beds of lacoustrene oozes were deposited. On the Kuz'mich stream (before this fact was known) an attempt was made to penetrate the bed of oozes, but the one diggings, which they were able to put down to a depth of 56 meters, hit on a steep slope of the ancient buried valley, the thalweg of which remained somewhere off to a side. The

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lower courses of all these right tributaries are dammed up by ground moraines from the Allakh-Yun'iy glacier and the associated valleys here are filled with a thick bed of gravels of depths up to 20 and 25 meters, these are probably fluvial glacial deposits and are covered over by inter glacial alluvium. Burial of the latter by fluvioglacial gravels and in the glacial valleys themselves below the belt of terminal moraines should be a widely occurring phenomenom, however, prospecting has not shown this to be the case.

Beyond the areas of glaciation, as well as within its boundaries, but in those valleys which did not undergo glaciation, the glacial epoch was marked by widely developed solifluction, which resulted in the accumulation of deep colluvial masses on the sides of the valleys, which in many valleys covered over the inter-glacial placers (the bench placer on the Segina stream). In some valleys in the southern part of the region the inter glacial alluvium is covered over by a layer of thin slime, and sometimes with layers and whole sheets of buried ice. These depositions cannot be considered as either fluvioglacial (which exclude the morphology of the valleys), nor as colluvial. They most of all resembles the deposits from the period of subsidence, and the presence of ice sheets in them shows that they were formed during the glacial epoch. Thus, it appears that the southern, extra-glacial part of the region underwent some subsidence during the period of the last glaciation.

In some valleys, including auriferous valleys (Bakhayya, Baatyla and others), normal, valley alluvial placers are developed, but the complete absence in these valleys of traces of glacial deposits deprives us of criteria by which we could distinguish between inter-glacial placers and post-glacial placers. It is to be hoped that, when the valleys of the region will have been systematically submitted to pollinic analyses, we shall obtain suitable criteria for distinguishing between interglacial and post-glacial placers. In the northern part of the region, in connection with the great size of the Quarternary uplifting, valleys of the canyon type are very numerous, in some of these the stream takes up the entire floor of the valley and is bordered by craggy primary outcroppings or steep stone taluses. In these valleys we are also deprived of criteria for distinguishing between inter-glacial canyons (stream) placers and the post-glacial placers. Quite probably, you could find here interglacial placers and post-glacial placers and post-glacial placers and placers of a mixed type, i.e., those inter-glacial placers which were eroded only partially during the post-glacial time. Bench placers are also known to occur among the inter-glacial placers. One of these (on the Zhar stream) was formed in association with normal erosions cycles of the inter glacial epoch. Others became bench

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bench placers in association with local erosion cycles during the glacial epoch. Thus, the Allakh-Yun' river, in the vicinity of the Segina stream, formed an epigenetic sector in the course of flowing around a large slide from a terminal moraine and cut off all the esturary part of the Segina stream valley. For the latter, the same thing caused a sharp lowering in the erosion base, as a result of which the stream formed a deep down-cut canyon in which a post-glacial canyon placer was deposited. This inter-glacial placer was preserved in the form of a bench placer which was overlain by thick masses of colluvium. It is quite possible to find placers at high terrace levels (100 meters and more), but they gave been very poorly studied.

The post-glacial placers are of considerably fewer types. Of these, we must first of all note the already-mentioned valley and canyon placers for which we do not have firm criteria in relation to the establishment of their post-glacial age. Canyon placers on the Segina were assigned their post-glacial age entirely on the basis of firm determination of the time when those processes occurred which resulted in their formation (in this case it was drainage of the lake dammed up by the terminal moraine, and the formation of the epigenetic sector). Some post-glacial valley placers are also dated very accurately. On the Minor stream there are small sectors with low terraces that are covered over by a ground moraine. In the valley placer of this stream the moraine was eroded and all the granite boulders contained in it were set down on the bedrock. Since, in the basin of the stream itself, granite does not appear anywhere and it was brought in here by the glacier, which had entered as a tongue into the estuary of the stream, the post-glacial age of the placer appears indisputable. This example shows that in other valleys, where the glacial deposits are absent, the inter-glacial valley placers could have been rewashed during the post-glacial time.

Thus, the following types of placers are established for the Dzhugdzhurskaya placer province:

I. Interglacial

1. Bench placers at various levels	(a) Normal bench placers
	(b) Became bench placers in connection with the processes of glaciation
2. Valley	(a) without firm criteria of interglacial age

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3. Stream bed
   (a) Without firm criteria for interglacial age

4. Buried
   (a) Ground moraine
   (b) Fluvioglacial depositions
   (c) Lacustrine oozes associated with damming
   (d) Colluvial masses
   (e) Alluvium from the period of subsidence

II. Post-glacial

1. Valley
   (a) Obviously post-glacial
   (b) Without firm criteria of post-glacial age

2. Stream bed
   (a) Obviously post-glacial
   (b) Without firm criteria concerning post-glacial age

At the present time nearly all these types of placers are being worked commercially, truthfully of course to varying degrees. Naturally, those placers which are easier to develop, such as the valley, stream bed and the bench placers on the lower terraces, are being developed to a greater degree than the placers on the high terraces and those which are buried deeply. Up to the present time the increase in gold reserves in the Dzhugdzhurskaya placer province came mainly as a result of prospecting for new placers along the strike of the main auriferous belt in the region and partly from the discovery of small nodes of gold content away from the main auriferous belt in the region and partly from the discovery of small nodes of gold content away from the main belt. At the present time this source of increasing the gold reserves is being worked almost to its end and the problem has arisen concerning the complete utilization of reserves in the

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types of placers within the boundaries of the already developed part of the main auriferous belt. I think that there are possibilities in this direction. Undoubtedly, some of the buried placers, particularly those which are deeply buried, have remained undiscovered by prospecting parties. In order to understand how easy it is to overlook deep-lying placers during reconnoitering, it is sufficient to mention that the first pits dug on the Segina stream for opening-up the deep-lying bench placer were all situated to a side of the placer. Revision of all the valleys in which there really should be deep-lying placers, but where they have not yet been found should bring to light new commercial sources. It is also quite possible that in the future commercial placers will be discovered on the high terrace levels of the second interglacial epoch as well as placers of the first interglacial epoch. These are the directions in which development of the regional and geomorphological investigation is to be directed.

II. ALDANSKAYA PLACER PROVINCE

The Aldanskaya placer province is characterized by completely different features in its geological development during the Cenozoic period. First of all, referring to the region of the Aldansk platform, only if on its margins, this province underwent recent uplifting only in connection with the general Cenozoic billowing of the Asiatic continent and probably partly in association with the youthful Mesozoic folding taking place four to five hundred kilometers south of this area, for which it had served has the foreland. This was caused by the fact that the Cenozoic uplifting of the Aldanskaya province was less noticeable in size and, apparently, less frequent, than for the Dzhugudzhurskaya province. In any event, these foldings did not create such high mountainous relief as would be able to produce glaciation during the Quaternary period. True, in certain parts of the province, in particular in the Tsentral'no-Aldanskiy raion we encounter, on high altitudes, very rare and not large but obviously erratic boulders, the systematical occurrence of which is indicative of the development of an ancient ice sheet in the province. In the Tyrkandinskiy raion there are traces of an insignificant occurrence of one of these valley glaciers. However, all these traces of glaciation are so slight both in their intensity and in their area of distribution, that they cannot be used for construction of the Quarternary geological province nor for age determination of the placers.

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Another feature of the Aldanskaya province is the broad area development of the ancient crystalline basement, composed of gneisses, crystalline slates and granites from the Archean, which are very resistent to erosion. Therefore, the Cenozoic uplifting, which the Aldanskaya province underwent, resulted in the production of new erosion levels mainly in the northern, least auriferous part, composed of soft sedimentary matrices, limestones and dolomites from the Cambrian and arkose sandstones from the Jurassic. In the southern and more auriferous part of the province, where the river valleys were incised into hard Archean rocks, deepening of the river valleys proceeded so slowly that even the incisions associated with the earlier Cenozoic upliftings have not been reached in many parts of the province even to the present time. For considerable areas of the province, all the Cenozoic incisions are summarized at the present time into a single 170 meter incision running through the low reaches of many of the river basins. All the higher-lying parts of these stream basins have preserved unchanged their early Quarternary and, probably, their Tertiary relief, frequently very greatly peneplained with more or less numerous remains of the ancient waste mantle. Only those sectors made up of Archean rocks, lying nearer the erosion base of gravitating towards large water arteries, which comparatively easily deepened their valleys, show rejuvenation of the ancient relief.

Thus, for a considerable part of the Aldansk placer province, neither the glaciation period nor the individual erosion levels can be used for determination of age of placers and of their stratigraphic distribution. On the other hand, a significant change in the climatic conditions during the Cenozoic time accompanied with preservation, in many instances, of the ancient waste mantle makes it possible to use the nature of weathering as an index of placer age. This is made somewhat easier by the fact that the predominent rock material in the placers normally consists of Archean granites and gneisses i.e., rocks whose formation corresponds to magmatic conditions or conditions of deep zones of metamorphism. Because of this there was a very wide diapson of changes in the conditions of weathering, the composition of the resulting products of weathering can sufficiently well describe the intensity and the peculiarities of the weathering processes of one or another time period. In contrast to this the argillaceous shales of the Dzhugudzhurskaya province, which themselves were the products of ancient weathering, are not very sensitive to similar comtemporary processes and cannot give any definitive products of weathering.

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The most ancient placers in the Aldanskaya province were found in the southern part of the Tsentral'no-Aldanskiy raion on the Tributaries of the Tommot river and the streams Otkrytyy, Turuk and Niryanzha. These placers correspond to the surface of the ancient peneplain of early Quaternary or Tertiary age and are the remains of its ancient waste mantle. They are characterized by strongly ochreous, brightly rust-coloured alluvium and extraordinarily strongly weathered shingles and bedrock, which are almost completely converted to either gruss or clay. In the cut the alluvial deposits have a fairly normal aspect, but, on attempting to remove pebble or boulders from the drift, they then crumble into clayey gruss. Primary rocks are almost never found in the footrock of the placer. Even though the footrock excellently preserves the structure of the primary rocks (for example, the primary folding of the gneisses is visible), but like the shingle, it has been converted in situ into gruss and clay. The signs of kaolinized weathering are very characteristic. The feldspatic rocks of the pebble and foot rock are normally converted into clay, and in some cases, into fairly pure white kaolin. Connected with this is the interesting discovery, approximately 100 kilometers south of the Khatyma river basin (in the central part of the Aldano-Timpton water divide), of a commercial deposit of white kaolin clay, on which has been based the production of refractory brick for the convenience of the placer region. Undoubtedly, the formation of these placers, which we shall call kaolinized, took place under completely different conditions than exist at the present time, which, in analogy with the Far East, most naturally of all refer to the very beginning of the Quaternary or even the Tertiary Period.

The ancient mantel of kaolin weathering was preserved within the boundaries of the southern part of the Aldansk platform in only a few places. Within the boundaries of the watershed areas in the majority of cases it was destroyed by the subsequent processes of denudation and weathering and could have been preserved only in places of local accumulation (river valleys, sink holes etc.). However, in river valleys in many cases it was rewashed during subsequent lateral displacement of the bed. We find an example of this in the Tommot river valley of the Kosa placer, where the youngest, comparatively slightly weathered pebbles in places over-lie the ancient kaolinized footrock. The preservation of the latter even in isolated sectors indicates that the rewash of the kaolinized alluvium took place approximately at the same level i.e., it was not conditioned by the lowering of the erosion base, insomuch has it was affected by the hastened erosion associated with changes in the climatic conditions.

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The shales deposited after rewashing of the kaolinized alluvium are the last age group of the Quaternary deposits in the Aldansk province. Within the boundaries of the Tsentral'no-Aldanskiy raion they are best represented in the Dzhekonda and Yllymakh basins, where boulder deposits of the Dzhekonda river and the streams Perebutornyy, Privlekatel'nyy, Amburdak and others are to be found. These placers are also characterized by ochreous, rust-coloured alluvium, but with significantly less weathering than the shingle and the footrock. The weathering is normally seen in the formation of strongly ochreous ribbons along the cracks, due to which the footrock of the Archean rocks fairly frequently is converted into gruss, but traces of kaolinized weathering have not been determined. This indicates that, in contrast to the Tommot river, here the rewashing of kaolinized alluvium was also destroyed along with the uppermost kaolinized layer of the ancient footrock.

The yougest valley placers in the southern part of the region are those on the Dzhekonda and Yllymakh basins, along the Dzhekonda itself and the stream Tokhto, Trudovoy, Perebutornyy, Privlekatel'nyy, Khrustal'nyy and Slatsevyy. They are characterized by the grey, comparatively slightly weathered alluvium, the foot rock is most frequently represented by hard primary rocks. These placers were formed at the expense of similar (not associated with lowering of the erosion base) rewashing of ochreous slide placers as were the others. Grey placers occur in the Dzhekonda basin at 1 or 2 meters lower than the ochreous placers, and sometimes on the same level. When they lie beside the ochreous placers, the latter extend as a second, parallel band. In some cases the grey placer overlies the ochreous one. In the latter case the lower (on the vertical) part of the placer consists of an ochreous alluvium and the upper of a grey matter. Normally the breadth of the grey alluvium is noticeably less than than the breadth of ochreous alluvium and it passes through the middle of the latter.

The kaolinized, ochreous and grey alluvium is an index of the climatic conditions under which it was formed. Therefore, in the Cenozoic history of the Aldanskaya placer province we can distinguish three periods of weathering:

1. Period of kaolin weathering.

2. Period of ochreous weathering.

3. Period of physical weathering.

This sequence of events indicates the general trend in changes in climate from the warm and humid during the Tertiary period to the sub-tropical of the present time. These changes, naturally, could not proceed continuously in one direction, since the cold climate of the Ice Age invaded this region on three occasions.

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The placers of the norther part of the Tsentral'no-Aldanskiy raion are generally younger than the placers of the southern part, but, most likely, the most ancient of them correspond in age to the younger placers in the southern part. Approximately the same picture, as seen on the Dzhekonda river, is encountered in the northern part of the region along the stream Malaya Kuranakh. Here the main valley placer is composed of grey coloured alluvium; on the left spur parallel to it and at a very low height above it (1 or 2 meters) lies a slide placer with ochreous alluvium. The preservation of these two placers was favored by the fact that part of the valley corresponds to the 15 meter terrace level, since a later deepening of the river valley had not yet reached here.

In most of the valleys in the northern part of the region this down-cutting was fully completed. Therefore, both the ochreous as well as the grey placers, corresponding in age to the Malokuranakh placers, are found here only in the form of fragments of bench placers (ortosala, and B. Kuranakh), as well as on the headwaters of these streams, where, as on the M. Kuranakh, the last down-cutting did not reach (the stream Pervomayskiy and others). This down-cutting lead to the formation, in the northern part of the region, of valley placers which are basic for most of the valleys (Ortosala, Kuranakh, the stream Zolotoy, Turuk and others). However, regional sinking soon began and the erosion activity was weakened, resulting in the accumulation of much alluvium in most of the valleys, in addition to which many of the valley placers were covered over by a layer of colluvial depositions. Naturally, this process of alluvium accumulation associated with sinking could not spread upwards along the river network through the steep, irrational parts of the profile, and therefore the alluvium of the sinking epoch could develop only in those parts of the river network where the previous 15-meter incision had been fully completed. Strong development of colluvial depositions indicates that the down-sinking took place during the last glacial epoch and, probably, was synchronized with that sinking which was mentioned earlier for the southern part of the Dzhugdzhurskaya province.

Subsequent new revival of erosion activity lead to a considerable amount of rewashing of the accumulated friable material to some definite depth. In most of the valleys this rewashing was not deep enough to disturb the valley placer. The placer remained undisturbed, but on the level reached by rewashing a new considerably richer placer formed and this was the "upper layer". The presence of two auriferous layers in the valley, the lower and the upper, is characteristic of the northern part of the Tsentral'no-Aldanskiy raion. Both are represented by grey alluvium. These two layers are noticeable along the rivers B. Kuranakh and the Ortosala, along the streams Proletarka

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and the Orochen, on the headwaters of the stream Zolotoy etc. The upper part normally lies at a shallow depth, from 3 to 5 meters, and the lower part at a depth of 8 to 10 and 12 meters, but in all cases where, over the placer, there was an accumulation of thick layers of colluvium or cones of debris from the lateral valleys, the depth of occurrence of the lower layer increases to 12 or 20 meters and in some places even to 30 and 35 meters. The upper layer always occurs among the contours of the present valley, since it is associated with the latest rewashing, and this determined the contours. The lower layer lies independently of these contours, i.e., sometimes among them and sometimes under the right or the left side "spur". During the process of exploration in the Tsentral'no-Aldanskiy raion this situation frequently resulted in the main valley placer not being discovered initially by the prospecting operations and was discovered only many years later.

Of the three periods in the Cenozoic history of the Aldansk province which we have cited, we know of placers of the same age only for the period of kaolin weathering; for the periods of ochreous and physical weathering several ages of placers are even now indicated, which correspond to different erosion levels, but the inaccuracy of the latter interferes with the dating of these placers to a more accurate age determination.

Very unique placers found within the boundaries of the Tsentral'no-Aldanskiy raion are the karst placers of two types, those of surface karst and those of underground karst. Wherever Cambrain limestones and dolomites emerge into the bed rock of the alluvial deposits, they frequently are karstic along with formation of either separate cones and slides or considerable parts of over-deepened bedrock stretching for kilometers. The depths of alluvial deposits and similar karst beds is measured in tens of meters, sometimes exceeding 70 meters. Exploration work has found similar beds in the valleys of the Tommot, On'ya, and Kuranakh. Although the sectors in the valleys of the On'ya and Tommot rivers are of no practical interest, since the valleys themselves are not gold-bearing, the situation is quite different in the Kuranakh river valley. Here, above the Sosnovyy stream stretches a commercial placer, lying on a bed of Archean rocks. Below the Sosnovyy stream the placer is underlain by a limestone bed, which for many kilometers down the Kuranakh river valley is over-deepened. The Kuranakh placer, consisting of grey gravels, becomes noticeably poorer after it changes over from a bed of Archean rocks to limestones. However, its occurrence directly on limestones. However, its occurrence directly on limestone beds has not been confirmed anywhere. It is underlain by a bed of ancient, strongly weathered ochreous travels, which crumble into gruss and fill-out the surface of the karst, which dates the time of development of the karst to the beginning of the Quaternary period. The ochreous gravels are weakly auriferous throughout

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their depths, but individual layers reach the limits of commercial content. Works put down to a depth of 39 meters did not reached the limestone bed; deeper diggings have not been made. Keeping in mind the frequent gold occurrence with depth of the surface karst (placers Dal'nayay taiga, Salair etc.) the weak gold content at all the depths of the ochreous gravels of the Kuranakh river and their occurrence in the commercially auriferous valley is cause enough to expect commercial gold content at their bases on the limestone (or argillaceous) bed rock.

Underground karst placers have been worked at the Nezametnyy placer. They consist of fillings in the horizontal karstic layers of from 2 to 10 meters in width. They have an unusually irregular shape and thickness of only a few meters and they stretch for tens of meters in length, making them commercially auriferous. The composition of the rubbles in these beds indicates that they were left there by a flow of rubble material over the surface, while the broad development of ore karst in the gold-ore deposits of the region with erosion by karstic waters over significant areas of the deposit which extend for tens of meters along the strike and dip, suggests that the placers may have been supplied with metal not from the surface, but directly by the krastic waters from the gold-ore deposits. We must not overlook the possibility that the placer itself on the Nezametnyy stream was formed by way of arrival of the metal across similar krastic beds from a fairly distant gold-ore deposit. Although, in themselves, these karstic beds do not have very rich concentrations of the metal and could hardly be called large commercial deposits, they do present interest from the genetic point of view: as a result of the arrival of metal across similar karstic beds, valleys which lie in completely non-auriferous geological conditions may turn out to be gold bearing. When directing exploratory work in individual valleys and on whole sectors, it is necessary to keep this in mind and to take into account the possible directions of flow of karstic waters and the possible transfer of gold by them.

As we have mentioned above, the history of the geological development during the Cenozoic time and the geomorphological conditions are much better expressed on all the Aldanskaya placer province than in the two other provinces. This is accounted for by the fact that it is not a youthful folded formation, but has a rigid, highly immobile basement of Archean rocks. Therefore, the nature of the placer deposits on all its territory is approximately the same. True, the most promising placer regions of this province, the Tyrkandinski and the Uchurskiy, are located closer to the erosion base than is the Tsentral'no-Aldanskiy raion. In connection with this the processes of deepening the valleys proceeded in it more intensively and more completely.

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The sectors of the ancient peneplain preserved after rejuventation of the relief and their corresponding early Quarternary kaolinized alluvial depositions are less extensive. These include, quite probably, extensive lacustrine plateaus, the Severnyy and Yuzhnyy Mar-Kyuel' in the Uchursk region. The last 15-meter incision, which preceded the period of subsidence, proceeded more completely in these regions, and this created favorable conditions for a more significant accumulation of auxiliary series of alluvium deposited during the subsidence epoch. Therefore the deep valley placers in both these regions should be much better developed than in the Tsentral'no-Aldanskiy raion. Actually, in the Tyrkandinskiy raion, all the manual gold mining is done mainly on the basis of deep valley placers. In the Uchursk region the deep placers have not yet been discovered, but this can be anticipated. In any event, the latest exploration data for the Eastern part of the Uchursk region indicate that the bedrock in some auriferous valleys lies under slides from a valley placer.

Thus, the following types of placers can be distinguished in the Aldanskaya placer province:

I. NORMAL ALLUVIAL

1. Kaolinized	(a) early Quaternary or Tertiary, only sectors of ancient relief.
2. Ochreous	(a) bench (slide) sectors of the ancient relief
	(b) valley, sectors of ancient relief
	(c) bench (slide, sectors of rejuvenated relief
3. Normal grey	(a) rewashed valleys, sectors of ancient relief
	(b) valley 15 meter level, sectors of rejuvenated relief

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(c) deep valley, sectors of rejuvenated relief (lower layer)

(d) shallow valley, sectors of rejuvenated relief (upper layer)

II. KARSTIC

1. Surface karst placers.

2. Underground karst placers.

3. Alluvial placers of various types, formed by the delivery of gold to non-auriferous valleys by karstic waters.

Within the Tsentral'no-Aldanskiy raion, all types of usual alluvial placers have been sufficiently adequately explored and there is no reason to expect that great discoveries will be made here. Surface karst placers in the Kuranakh valley may prove to be of considerable commercial interest. They should be tested by exploratory operations down to the primary bed rock. It is possible that small underground karstic water-borne gold. Reexamination of the valleys of the latter type deserves attention. In the Tyrkandinskiy and Uchurskiy raions it is quite probable that there will be considerable expansion of the raw material space for various types of mining operations due to further exploration of the deep valley placers. It is also possible that kaolinized placers will be found in parts of the peneplained relief along with karstic placers of various types. Due to the unfavorable conditions for formation and preservation of terraces, widespread development of bench placers is not very likely.

III. PRIAMURSKAYA PLACER PROVINCE

The Priamurskaya placer province is exceptionally varied in its geological structure, the history of its geological formation during the Cenozoic and in its geomorphological setting. It includes zones of youthful, Meso-Cenozoic foldings, and Paleozoic folded formations in an area of pre-Paleozoic foldings of the Stanovik type. Some parts of this province underwent

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predominant billowing during the Cenozoic, very different in magnitude for various sectors, others, on the contrary, are areas of subsidence, the third group remained more or less stable and, finally, the fourth group underwent various fluctuating movements with one or another total effect. Due to this we encounter sectors of medium size mountains here, with noticeable transitions in places to high mountain relief forms, and areas with gently rolling forms of relief and sectors of typical peneplain, as well as plateaus dissected by river valleys and perfectly flat alluvial plains. No less varied also is the lithological substratum, forming all these different types of relief: here are very stable gneisses and crystalline slates with pre-Paleozoic granitic intrusions penetrating them, also foundation phyllites and metamorphic slates, beds of soft argillaceous slates of Paleozoic and Mesozoic age, extensive areas of Paleozoic granites, effusive-tufogenic series of various thicknesses, beds of limestones, weakly diagenetic, semi-friable beds of Cenozoic and Upper Mesozoic age and finally up-thrown alluvial plains of friable Quarternary gravels, sands and oozes. It is perfectly natural that, with such a variety of geological and geomorphological conditions, the placer deposits of the province could not be less varied. It is therefore completely impossible to give any sort of a general description. Even the principles, which could be used as a basis for age differentiation of the placers, must be different in various localities. Although, on the headwaters of the Selemdzha river, situated in a sector of intensive Cenozoic uplifting, the most natural and suitable method of distinguishing placers would be by specific erosion levels, which are clearly expressed in the relief in the form of quite numerous river terraces, in the Nizhne-Zeya river plain and its comparatively stable position during the Cenozoic Period and the absence of terraces this principle would not be applicable, any more than it would be for the Verkhne-Zeya depression with its tendency towards downwarping. The signle common feature for all the Priamurskaya placer province is the almost complete lack of any traces of Quaternary glaciation. Only the highest mountainous sectors of the Selemdzhino-Bureinskaya mountain country shows very insignificant development of glacial deposits and glacial forms of relief (moraines, corries). But these are isolated points on the territory of the whole province and the traces of glaciation on them are so insignificant that they cannot be used for age differentiation of placers. All the remaining evidence about discovery of traces of glaciation in the Priamurskaya placer province do not deserve investigation and it can be reasonably supposed that during the Quaternary period this province did not undergo glaciation, with the exception of insignificantly small pinnacle glaciers in isolated, and most elevated, points in the country. After an examination of the criteria of age differentiation of placers for the various parts of the province and comparison of them among themselves it appears that the most suitable method of differentiating them is by the degree of weathering. In connection with this in the Priamurskaya province, besides the kaolin, ochreous and physical

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weathering established for the Aldanskaya province, we can also distinguish a period of land wasting weathering. The typical kaolinized placers were not found by the author in the Priamurskaya province, but the widespread occurrence of kaolin weathering products in the Upper-Tertiary and Lower-Quarternary depositions of the province are indisputable evidence of the past development of these placers, which at the present time, obviously, have in most cases been destroyed by the processes of wasting. It is nevertheless quite possible that kaolinized placers will be found in sectors of more prolonged accumulation and preservation of the ancient waste mantle.

Land waste placers are of a later age group. They are depositions of ochreous colour, in which the gravel, boulders and foot rock, composed of more stable materials, have been converted into gruss. Only the more stable rocks remain unwasted: quartz, quartzite, hornfels, flint, some porphyries and porphyrites with a close-grained structure etc.. The dirite rocks rich in hornblende sometimes produce a gruss of greenish tinge, which is indicative of insufficiently intensive chemical weathering. Dumps from the workings of land waste placers consist of enormous accumulations of land waste material of ochreous tinge and comparatively fine gravels formed from the most stable rocks.

This age group of placers includes the lower layer of the placers at the Oktyabr'skiy deposit, the Yasnaya Polyana placer on the Dzhalta river, on the right tributary of the Ilikan, the left-gide placer on the Boris-Nikolaevskiy stream, which is a tributary of the Gal'chima river, near the Western boundary of the Verkhne-Zeya depression. The Yasnaya Polyana placer is particularly interesting. The youthful valley placer on the Dzhalta river, which produced a great quantity of gold, consists of normal grey alluvium dating to the end of the Quaternary period. On the right spur of the Dzhalta river, the slightly weathered primary rocks consisting of talus on the surface, rise fairly high up the slope. Further along the spur there is a sharp lowering of the bedrock, in which lies a thick (up to 40 meters) series of ancient alluvium depositions, of up to 1 kilometer in width. This series lies on a strongly weathered footrock of granites and gneisses. The materials of the footrock have been disintegrated for depth of many meters in situ into a very ochreous gruss, which is easily crumbled even in the fingers. True, we were not able to find traces of kaolin weathering such as we had found in the Aldansk region. In spite of the fact that the bedrock of the Yasnaya Polyana placer contains deep (to 5 meters) channels, which served as routes for run-off hydraulic wastes, there are no noticeable traces of lesser weathering of the bedrock at this depth. This indicates that waste weathering penetrated very deeply into the bed of primary rocks.

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Bouldery gravels of 2 to 2.5 meters in depth lie on this weathered footrock. As for the materials of the footrock, most of the rocks in these gravels have been weathered to the state of a very ochreous gruss. Only the most stable rocks (quartz, quartzite, and some porphyries) have given the gravels some hard boulders and pebbles. The gravels contain a plentitude of boulders that are up 2 and 2.5 meters in diameter of the most varied materials: gneisses, granites, porphyries, quartzites etc.. Granite and gneiss boulders are also very strongly weathered, as are the materials of the bedrock and the gravels. These gravels are the lower auriferous horizon of the placer.

The lower boulderous gravels are overlain by beds of alternating gravels and well-washed river sands of depths to 20 and 30 meters. The stoney material in these beds had been submitted to very strong weathering, with the difference that some layers of gravel and particularly of river sands are less ochreous than the bedrocks and the lower boulderous gravels, they do not have the bright yellow, but only the yellowish-grey, yellowish-white and even light grey colors. Characteristic features of these beds are: the complete absence of boulders and even very coarse gravels on the one hand, and the absence of oozes and argilaceous layers and any sort of vegetable remains, on the other hand. These sandy-gravelly depositions are incised by the upper boulderous gravels, which are generally of the same nature as the lower boulderous gravels but differ by the somewhat lesser depth (up to 2 meters) and the smaller quantity of boulders and size (1 to 1.5 meters, very rarely up to 2 meters), and much lesser gold content. In all other respects (coloring, degree of weathering, lithological composition of the gravels and boulders etc.) they are perfectly identical with the lower boulderous gravels.

The Yasnaya Polyana series can be traced both westward and eastward along the Dzhalta river for a considerable length, crossing the present day valleys and water divides, which characterizes it as the depositions of an ancient river network. True, these strongly boulderous lower and upper gravels and the nature of the intervening series between them very strongly suggest fluvioglacial depositions, and involuntarily suggest glacial origins for all the series. However, on close inspection this proposal must discarded. First of all, neither the lower nor the upper gravels are moraine depositions.

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If the boulders contained in them are of glacial origin, then it must be realized that these gravels are in fact moraines which have been rewashed by river waters. Therefore, we must consider either a two-stage glaciation or a two-stage advance of a glacier, separated by a period of accumulation of thick fluvioglacial series. In this connection not a single moraine was preserved, but all of them were rewashed by river waters. Such a hypothesis is very complicated and very remote. Besides, there is still another essential difficulty. The glacial gneisses of this series, naturally, could not have been included in the intensive weathering to which it was submitted during glacial time. Therefore, it must be considered to have taken place afterwards, when the series had been definitely formed, or, in other words, we must admit that there did occur extremely intensive and very uniform weathering of the whole series to depths in excess of 40 meters, and to which we must also add more than 5 meters of foot rock. Weathering to such a depth under Far East conditions, even if the climatic conditions were different, is very doubtful. More intensive kaolin weathering took place in the Aldansk region to depths of only a few meters.

We therefore consider it more probable that the Yasnaya Polyana series is a normal alluvial deposition of a great river artery. The boulders and gravels are ordinary river boulders, borne down by ice. The modern depositions in the Zeya river contain similar boulders and these are as plentiful as the boulders and gravels of the Yasnaya Polyana series and, in form, size and distribution in the gravels they differ very little from the boulders at Yasnaya Polyana. The intervening series in this case must be assigned to depositions taking place during a period of subsidence. The intensive weathering of the series proceeded in proportion to its accumulation and was always acting to a depth of at least several meters, but not many ten's of meters.

The left spur of the stream Boris-Nikolaevskiy, near the porphyry of the Verkhne-Zeya depression, has an old placer at a comparatively small height above the present stream bed. This placer consists of ochreous land wasting gravels, lying on a foot rock of the same character. This placer is perfectly analogical to the Yasnaya Polyana series.

The lower layer of the placers at the Oktyab'skiy deposit and its typical development are also represented by strongly ochreous wasted gravels, analogical to the gravels at Yasnaya Polyana and the Boris-Nikolaevskiy stream. They lie on an ochreous, wasted footrock of the same nature. The footrock and the gravels have their typical ochreous-wasted appearance only

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when they are represented by granites. Diorites and granodiorite-porphyries, abounding in hornblende, give the weathered gruss a greenish, and sometimes clearly green coloration. The difference in coloration is so pronounced that parts of the developed granite and granodiorite-porphyry bedrock can be outlined from an aircraft by the color of the spurs. Quartz, silicified rocks, as well as hornfels, sandstones etc. are weathered with considerably more difficulty and they form the small unweathered gravels in the wasting shingles and, due to their presence in the composition of these gravels, the gravels themselves lose their characteristic ochreous-wasted appearance.

The ancient gravels are overlain by well washed ochreous river sands and thin layers of oozes of various thicknesses and of a greyish color, from light grey to nearly white or nearly black. More darkly colored oozes are very rich in vegetable matter. In typical cases, younger, grey gravels and unweathered gravels as well as granites overlie the turfs of these ancient placers. In their own turn these are overlain by grey and black oozes containing vegetable matter, grey river sands and layers of fine sand-clay refuse gravels, relating to the modern epoch and sometimes containing numerous nuggets. The vertical distance between the ancient and the youthful gravels is usually measured in several meters. It is noticeably greater on the lower parts of the stream and decreases towards their headwaters. At the very sources of these streams the grey gravels have in places been deposited at the same level as the ancient gravels, which were rewashed as a result. In such cases we see a very complex picture of the placer's structure, since the coloration of the youthful gravels, depending on the degree of rewashing, varies from the typically grey to the typically ochreous (or greenish). The youthful gravels are always confined to the contemporary, morphologically defined valley, whereas the ancient gravels occur in both the contemporary valley and also deviate from it under the spur and sometimes for distances of hundreds of meters. In some case the ancient and youthful placers even lie on different sides of low hills, formed of primary rocks and rising out of a fairly flat relief (Sennushka placer).

The ochreous gravels containing poorly weathered hard pebbles from all types of rocks are another age group of placer in the Priamur'ye. They have a very diverse degree of clay content and a fairly uniform coloration, but always in the yellow, orange, brown and reddish tones. On the right spur of the Boris-Nikolaevskiy stream, opposite the left spur wasting placer, lies the Maksimovskiy spur placer, represented by hard ochreous gravels, lying approximately at the same leval as the wasting gravels of the left spur. This indicates that rewashing of the ancient wasting placer took place at the same level, in this case, without lowering the erosion base due to which a strongly

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weathered wasting bedrock was preserved under the cover of a hard, slightly-weathered gravel. In the vicinity of the Oktyab'rskiy deposit the development of the hard ochreous gravels has not been detected, and for this reason they make up a large porportion of the depositions along the Nizhne-Zeya depression along the railroad from Svobodnyy-Tygda to Tygda (SIC).

In the basin of the Selemdzha river all the valley placers are represented by normal grey gravels. Along the El'ga river, the left tributary of the Khargu, the right, approximately 15 or 20 meter terrace is composed of hard, poorly weathered gravels of ochreous color, overcovered by thick (6 to 10 meters) grey alluvial oozes and slimes. Older deposits in the basin of the Selemdzha river were not observed by author but, judging from the presence of very high terraces in places (up to 150 meters) and the preserved auriferous alluvial deposits, it may be suspected that ancient wasting gravels will also be found here.

The Petrovskaya placer at the Zolotaya Gora deposit is very interesting, it lies on the very water divide of the Tukuringra Khrebet. There are several horizons of auriferous sands here; the younger of these are grey in color, the older ones are ochreous, but with large pebbles. Earlier, the water divide was located somewhat further north and the placer was entirely situated on the southern slope of the ridge, in the valley of the Abka river, which belongs to the Urkan river basin. In association with the regressive erosions of rivers on the northern slopes (the Khugder river, a tributary of the Gilyuy) the water divide later moved several kilometers to the South, with the result that the placer ended up lying on both sides of the water divide. South of the water divide we have shallow-lying grey placers and deep placers which are both grey and ochreous. Northward from the water divide the ancient placers were preserved as bench placers sloping southwards. The valley placer of greyish coloration slopes northward here. All the complex placers have been explored very poorly. The deep placer, lying under the spur, was discovered recently during exploratory operations in the valley of the Gilyuy river.

The valley placers are everywhere represented by grey, very youthful gravels. In sectors of intensive billowing, such as the Selemdzha river basin, and comparatively stable areas such as the Nizhne-Zeya depression, we do not find deep-lying buried placers of this type. The buried placers consist of either wasting gravels (vicinity of the Oktyab'rskiy deposit), or ochreous (terraces on the El'ga river). However, on the Gilyuy river and at the Petrovskaya placer, the grey gravels are buried to a considerable

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depth. Examples of this are seen in the vicinity of the Nizhne-Zeya depression. The valley placer on the Boris-Nikolaevskiy river consists of normal grey gravels. This placer has comparatively coarse, weighty gold. On the lower waters of the Gal-Chima stream the placer retreats under the grey lacustrine oozes, which are apparently depositions from the Verkhne-Zeya depression. Over the top of these oozes lies the upper horizon of grey gravels, containing only very fine gold. These upper gravels with their small gold content are being worked at the present time at all the placers which lie near the periphery of the Verkhne-Zeya depression. The underlying grey oozes have not been penetrated by exploratory workings in a single case, although it is reasonable to expect richer placers beneath them than lie above them.

Similar relationships between the grey oozes and the gravels in the Gal-Chima river indicate that they are younger than even the lowest horizons of the grey gravels, not to mention the ochreous and wasting gravels. However, this refers only to the grey oozes, which make up the very uppermost horizons of the deposits in the Verkhne-Zeya depression. Apparently, the relative burial and uplifting of this depression took place repeatedly during the Quaternary period, and the bed of grey oozes relates only to the last epoch of subsidence. Beneath the more central parts of the depression, there undoubtedly lie not only ochreous and wasting gravels, but very probably more ancient deposits as well.

The far from orderly and systematic presentation of the geology of some placers in the Priamur'ye shows how varied and diverse in character are the placers in separate parts of the Priamur'ye placer province. The Selemdzhino-Bureinskiy mountainous country is a sector of numerous and significant Cenozoic upliftings. Here the placers of various age lie sequentially on eroded levels at various heights, beginning from the 150 meter terrace level, right down to the level of the contemporary valley. Probably, the placers at the highest terrace levels correspond to the age of the wasting gravels, placers at the intermediate terrace levels down to the 20 meter level inclusive, are ochreous gravels and the placers on the lowest terraces and in the flood plain correspond to grey gravels. Nowhere on the terrace levels has there been found, to the present time, the two auriferous beds of different age and height, which indicates the absence of the considerable burying accompaying the formation of the upper bed. However, the accumulation of alluvial oozes, on the 20 meter terrace of the El'ga river and, in places, the proluviual-colluvial formations could lead to fairly deep-lying occurrence of some placers. The main prospects for the Selemdzhino-Bureinskiy mountainous country lie in the area of systematic exploration of the bench placers, beginning with the lowest, and then with the higher levels, which will make it possible to add a considerable increase to the reserve areas for mining.

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The situation is considerably more complex in the area of the Tukuringra Khrebet, and probably, its adjacent Stanovik area. At the end of the Tertiary, beginning of the Quaternary periods, a significant part of these areas were apparently peneplained. As seen at Yasnaya Polyana, the effect of peneplained. As seen at Yasnaya Polyana, the effect of peneplaination was intensified by considerable burying of the country under accumulations of alluvium to depths of 40 meters and the formation of two horizons of auriferous gravels. Probably, the most peneplained parts were converted to alluvial plains, which lead to considerable redistribution in the river network. During subsequent Quaternary upliftings and dissections of the land by young valleys the altered river network was more firmly entrenched by means of incisions into the foot rock and additional changes as a result of the work of regressive erosion. In the meantime, the ancient auriferous river deposits of the peneplain were preserved within the newly reformed water-shed areas, lying independently of the contemporary outline of the river network.

The Quaternary incisions of the valleys, which were more numerous in some sectors than in others, resulted in the development of grey auriferous river terraces. Uplifting of the country, accompanied by incisions of valleys, alternated with subsidence, as a result of which the buried placers were formed at various erosion levels. The Cenozoic history of this territory is very poorly studied for the purpose of finding out possible parallel terraces and explaining at what erosion levels the buried placers do lie. But it may even nowbe stated that the large river arteries responded very quickly to both the upliftings and the subsidence of the land and formed the bench and buried placers, the numbers of which should be much larger in the bigger river valleys, than in the valleys of the small streams.

On the whole, the Cenozoic history of this area is characterized by alterations between upliftings and subsidence, with a slight predominance of uplifting, which can be seen in the occurrence of the Yasnaya Polyana placer at a height, although small, above the present day placer valley. The types of placers are exceptionally varied, beginning with placers of the ancient river system through bench and buried placers of various erosion levels and ending with the normal valley placers, in some parts of the present-day incision there are stream-bed placers. All these types of placers are nearly completely unstudied, and their study and the necessary exploration-prospecting operations could lead to the discovery of a great quantity of new commercial areas, suitable for manual working. In this sense the region is very promising.

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The Verkhne-Zeya depression, in spite of the apparent differences in nature of Cenozoic tectonic movements is similar to the Tukuringra district. Here also upliftings alternated with subsidence, but with some predominance of the latter, as a result of which the depression itself was formed. Probably, the Verkhne-Zeya depression is one of the most complete stratigraphic faults of the Cenozoic formation in the Priamur'ye, and the possibility cannot be overlooked that the initial formation of the depression relates to the roof of the Mesozoic. However, the repeated upliftings taking place in the depression, together with the entire surrounding framework of mountain features should have led to partial erosion of the Cenozoic deposits and to down-cutting into beds of river valleys with probably depositions in them of auriferous river gravels washed down from the surrounding mountains. The entrenchment of grey gravels in the Boris-Nikolaevskiy stream relative to the wasting and ochreous gravels immediately adjacent to the depression is indisputable evidence of the foregoing. On the other hand, at the time of subsidence the contours of the depression were widened, burying valleys under sediment, and probably at some time or another it also buried the bench placers lying on the mountainous sectors of its periphery. Since there is considerable folding of the relief in these areas and there are commercially auriferous deposits almost everywhere, it is to be expected that the peripheral sectors of the depression will show that, buried at a comparatively shallow depth, there are numerous valley and some bench placers, containing large reserves of gold in them.

The Nizhne-Zeya depression is basically different from the Verkhne-Zeya depression. Throughout the Cenozoic time this district did not undergo either noticeable uplifting nor subsidence, it was distinguished by a stable position of its erosion base. The formation of land-wasting gravels was limited to a single horizon, in contrast to the Yasnaya Polyana region, which indicates that there was no corresponding stage of subsidence here. The formation of ochreous placers took place in only a few localities. Bench placers of any age are absent, which indicates that there were no significant upliftings. The formation of grey auriferous gravels did not take place until the end of the Quaternary period, approximately at the same level as the ancient land wasting placers, if we discount the greater slope of the ancient water courses. Thus, beginning with the end of the Tertiary period, this district preserved, apparently, an unchanged position in elevation. Associated with this it has a very ancient relief which resembles a peneplain in its character, and in places it is represented by typical peneplain with the characteristic ancient wasting mantle (wasting gravels). This is the same peneplain which, in the Tukuringra district and northward, has now been

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deeply incised by young river valleys and has preserved its peneplain character in only scattered localities. It is emphasized that such a character of the Nizhne-Zeya depression is in contradiction to the established notions concerning the origin, in this part, of the zone of upper-Mesozoic folding and the gradual subsidence of the younger dislocations to the north, in the direction of the Stanovik Range. On the other hand, as we have seen, this area had a very stable position during the Cenozoic period, whereas those located northward of it were much more mobile.

Thus, in the region of the Oktyab'rskiy deposit, together with the northern part of the Nizhene-Zeya depression, we have two chronogically sharply distinguished periods of placer formation, the land wasting placers and the grey gravels. Because the nature of the relief closely resembles the peneplain, it makes it very regular for significant changes during the Quaternary period in the position of the thalwegs of valleys and the unrestricted spread of the ancient and the comtemporary placers. However, each auriferous valley may be expected to have both ancient and youthful placers, and it is just this point of view which is required when examining all the auriferous areas. This will safeguard us from overlooking commercial placers in unexplored auriferous valleys. Only in those cases where the Early Quaternary valley underwent aging and did not have a watercourse in it during the period of formation of the auriferous grey gravel placers, or on the other hand the Late Quaternary stream was laid down in a place where there was no ancient valley, can we expect to see only an ancient or only a youthful placer. The peneplained character of the relief and the absence of associations between the ancient placers and the comtemporary valleys makes it very difficult to find the placers, but at the same time it increases the prospects for this district. As a result of a systematic coverage by prospecting and exploration parties we may anticipate the discovery of a whole series of commercial areas.

Within the boundaries of the Primurskaya placer province we can distinguish several other areas which are characterized by a different history in their development during the Cenozoic period. Above the Priamur'ye (Urkano-Ol'doyskiy raion) the placers are quite similar in nature to the placers in the Tukuringra district. The lower Priamur'ye is a very complex and tectonically uplifted zone, referring to the district of Mesozoic folding, where sectors of uplifting alternate with individual more or less extended depressions and where you may expect to find great development of bench and buried placers. The Amuro-Ussuriyskaya depression, bounded on the south-east by the Malyy Khingan river, resembles the Verkhne-Zeya depression but it is more mobile and quite probably is characterized by a greater depth of Cenozoic deposits. Along its periphery, as is the case in the Verkhne-Zeya depression, we may expect to find buried placers.

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On the whole, the Priamurskaya placer province, according to its Cenozoic history, geomorphology and geology of placers is exceptionally complex and varied, moreso than any other province in the Soviet Union. This makes the geological study of its placer deposits particularly difficult, but the province itself is very promising as an area for discovery of many new commercial placers of complex type, which could not have been found to the present time because of the primitive method of study, prospecting and exploration. This is the part of the Soviet Union which must be expected to provide the increase in reserves of gold placers suitable for working.

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ON THE STRATIGRAPHY OF THE UNCONSOLIDATED DEPOSITS OF THE BALEYSKIY RAION IN THE ZABAYKAL'YE[1]

In the summer of 1947 the author had the opportunity to visit the region of the Baleyskiy auriferous deposit in the eastern Zabaykal'ye and become briefly acquainted with some of the cuts into the unconsolidated deposits of the region, including auriferous deposits. In spite of the briefness of this familiarization, some of the cuts appeared so demonstrative that they give basis for the construction of a first approximation of a stratigraphic scheme for the unconsolidated deposits in this part of the Zabaykal'ye. In connection with the development in the Zabaykal'ye of operations for examination of the complex types of auriferous placers this scheme could prove to be of use for further conduct of these operations.

The most characteristic horizon of the cut in the unconsolidated series which the author saw was a very unique proluvial deposit, consisting of obliquely laminated sandy-wasting deposits with alternations of this layers of coarse-grained sand, gruss and sometimes gravels. The friable material of these deposits is on the whole, poorly rounded, and only in places are there individual layers of somewhat better rounded materials (gravels). Similar types of deposits are very widely developed on the apexes (water deposited cones) of all the right tributaries of the Unda river, where they lie both in the thalwegs of steep creek beds, abandoned by permanent water courses, and along the foot of the surrounding slopes. The lithological composition and conditions of occurrence of these deposits indicate that they are proluvial and not alluvial deposits. The conditions of occurrence of these deposits along the boundary of the Borshchovochnyy Kryazh and its adjacent "YuV Undinskaya" depression are more characteristic. Here, these proluvial deposits form a typical shelf foot, which is so characteristic of the regions of development of the so-called "gobiyskiy" landscape. This proluvial shelf extends along the foot of the Borshchovochnyy Kryazh through all three of the sectors where the Kryazh borders directly on the Undinskaya depression, i.e., in some places continually for several kilometers.

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[1] Published according to a manuscript written in December of 1947. Editor

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As is known, there is a break in time for the Quaternary history of the Zabaykal'ye, when the dry, semi-barren climate of the Mongolian steppe spread far to the north and took in a considerable part of the Zabaykal'ye. Thus, the proluvial shelves of the foot are typical formations of just that semi-barren (gobiyskiy) landscape, and most naturally the proluvial shelves at the foot of the Borshchovochnyy Kryazh must be considered as deposits of just that period in the Quaternary history of the Zabaykal'ye. Evidently, the intensive desert weathering of granites, mainly physical (as may be seen from the unbroken nature of feldspars, the absence of argillaceous fraction in the proluvial deposits and the grey colouring of the latter), produced an enormous amount of fine (sandy-wasted) friable material. Periodically falling rain washed this material down the mountain slopes into the valleys and accumulated it at the foot of slopes. The absence of permanent water courses in the valleys made further transporation of the material by flowing waters improbable and resulted in the accumulation of thick shelves at the foot of slopes.

There are two factors which indicate that this cannot be an alluvial deposit of the Unda river itself, which would correspond to the period of some other and significantly more peaceful regimen, these are: the lithological composition of the deposits and the abrupt increase in their depths at the foot of the Kryazh. The loose material of these proluvial deposits is extraordinarily uniform and it consists of sand, gruss and gravels of only the local rocks, such as granites of the Borshchovochniy Kryazh and occasionally (Kozakovskiy raion) their intrusive rocks. The varied material of the other, widely distributed rocks, which are so characteristic of the Udina gravels are entirely absent from the proluvial deposits. Their thickness varies very regularly, from a few tens of meters lying directly at the foot of the Kryazh to several meters at the modern bed of the Unda river, with some variation in the latter case depending on how far the river lies from the foot of the Borshchovochniy Kryazh. The width of these deposits also varies from a few hundred meters to several kilometers.

The proluvial deposits of the Gobiyskiy epoch are weakly but commercially auriferous in places. In the vicinity of the Baleyskiy deposit itself the conditions for gold presence are extremely unfavorable, since the deposit emerges in the middle of the Udina proluvial depression, in a remnant of primary rocks, on which the proluvial train of the foot rest on its downstream side. In addition, the extremely fine gold of the Baleyskiy deposit is unsuitable for concentration in placers. Therefore in the Baleyskiy deposit area the gold-content of the proluvial deposits has not been detected. The Kozakovskoye deposit situated upstream on the Unda river

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refers to another type of deposit (this deposit is genetically associated with the small intrusions of diorites) and has much coarser gold, which is very well suited for concentration in placers and is favorably situated in relation to the proluvial deposits along the foot directly adjacent to the foot of the Borshchovochniy Kryazh, from where the wash down of fine material in the proluvial deposits had originated. It is therefore not surprising that here the proluvial deposits are faintly auriferous. However, the extreme irregularity of distribution of gold in individual layers among the enormous thickness of the proluvial deposits does not permit one to detect any enriched ribbons, which could be suitable for manual operations. This deposit seems to be quite profitable for mechanical working, particularly for a hydraulic process.

Due to the very great thickness of the proluvial deposits and their very significant area of distribution it is quite natural that during the process of their formation they buried beneath their own layers much earlier alluvial deposits (pre-Gobiysky) which are commercially auriferous in places. These pre-Gobiysky shingles are uncovered by the Unda river in places, just a little higher than the modern water cut-in it under the strata of proluvial deposits. In many other places they have been determined by exploratory and mining operations on the pre-Gobiysky auriferous placers, under the strata of proluvial deposits at depths of 15 to 25 meters. Because of the great thickness of the proluvial deposits they could quite likely have buried not only the pre-Gobiysky alluvial deposits in the ancient thalwegs of valleys, but also the lowermost parts of the relief, including river terraces. It is quite possible that such pre-Gobiysky buried river terraces are present in the region, but the author was not able to find any during these very hasty observations.

The pre-Gobiyskiy valley gold placers, since they correspond to the logest period of gold accumulation and were completely untouched by the later erosion, should be the main type of commercial gold placer in the Baleyskiy raion. They have been found in a whole series of sectors in the region. A placer which had been intensively worked extends from the area of development of auriferous conglomerates in the region of the mouth of the Kamenka river under the right spur of the unda river, under the strata of proluvial deposits from the direction of the Baleya river. In the vicinity of the Kozakovskiy deposit the gold-ore veins forms a whole network, which extends parallel to the foot of the Borshchovochnyy Kryazh. The valleys of all the right streams of the Unda river which drain this auriferous zone are to some degree gold-bearing. However, the richest placers in these valleys

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have been buried under a thick layer of proluvial deposits and the position of the ancient valleys. Some of these pre-Gobiyskiy auriferous placers (for example the Kozakovskoye) were prospected and worked more ore less completely. Others were prospected over a comparatively small extent and after that they were abandoned. At the present time there is cause to expect that they, like the Kozakovskoya placer, may extend over a considerable distance even if not to the modern, already incised Unda river valley. Finally, there may be such auriferous buried valleys which have not been found and explored to this time.

The post-Gobiyskiy alluvial deposits in this region are of two ages, represented by the upper and the lower post-Gobiyskiy shingles. The upper post-Gobiyskiy shingles lie over the proluvial Gobiyskiy depositions, and are somewhat cut into them, but they do not cut through the whole stratum. They cover the right terrace of the Unda river below the mouth of the Baleya, and also in the region of the mouth of the Kibereva, right Tributary of the Unda, and they form a narrow belt along its right bank, lying at a considerable height above the present day valley-floor, overlying the proluvial deposits. Judging from the presence of only gravels from the Borshchovochnyy type of granites in the shingles, they are older than the post-Gobiyskiy bed of the Kibireva stream. The upper post-Gobiyskiy shingles have not yet been found in the region of the Kozakovskiy deposit, which would be of greatest interest in relation to gold-bearing placers. However, serious attention must be given to the possibility of discovering them here, since being incised into the strata of the faintly auriferous poluvial deposits, they could have been enriched with gold by rewashing of the latter to such a concentration that they would be of interest for manual working.

The lower post-Gobiyskiy shingles fill out river valleys which are incised into the strata of proluvial Gobiyskiy deposits. In comparatively narrow valleys in the confines of the Borshchovochniy Kryazh itself, as a result of incising the proluvial Gobiyskiy deposits were completely or almost completely eroded. In the area of development of the proluvial foot train the post-Gobiyskiy valleys were incised into the proluvial strata to some depth which is determined mainly by the thickness of the proluvial deposits in each locality, i.e., by the location of the incised valleys relative to the foot of the Borshchovochniy Kryazh. The river valleys of the upper post-Gobiyskiy erosion level could have been displaced laterally in relation to the buried pre-Gobiyskiy valleys due to the accumulation of thick strata of proluvium. In connection with this the incised post-Gobiyskiy valleys are spatially related to the buried pre-Gobiyskiy valleys purely coincidently. In some cases they incise the entire thickness of proluvial depositions,

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and the lower post-Gobiyskiy shingles lie directly on the pre-Gobiyskiy gravels or are even partly incised into them. This is the situation with the young shingles in the Udina valley in the vicinity of the Novo-Troitskiy settlement. In other cases the lower post-Boyiyskiy shingles are incised into only part of the proluvial strata and lie on the lower horizons of some thickness. This type comprises all the youthful auriferous valleys of the streams in the Kozakovskiy region. Finally, it is also possible that the youthful valleys lie over the buried pre-Gobiyskiy relief. In these cases, having cut throught the whole stratum of proluvial depositions, they should have incised themselves into the underlying primary rocks, which should not be considered as an indication that the buried pre-Gobiyskiy alluvium is absent in this sector.

We must also mention still another item in the cut of unconsolidated strata in the Bleyskiy region, even though it does not have a direct relationship to gold presence. This is the young clumpy talus which has accumulated in spots at the foot of the mountain slopes over the proluvial deposits or upper post-Gobiyskiy shingles. Its stratigraphical position and normally small thickness indicate of a short duration of accumulation. Obviously, changes in the climate from a semi-desert (proluvial deposits) to a humid (upper post-Gobiyskiy shingles) did not stop at this and continued in the direction of considerable cooling, which lead to the development of frost weathering and its characteristic products the large clumpy talus. The difference in the character of the products of desert and frost weathering is very clearly distinguished in the Baleyskiy raion.

Summarizing the following, we can give the following brief description of the section of unconsolidated deposits in the Baleyskiy raion (from the bottom upwards):

1. Pre-Gobiyskiy shingles. These contain the main commercial gold-bearing placers of the region. They are normally buried under the proluvial deposits to depths of 20 and 25 meters, rarely they are uncovered in isolated sectors by the post-Gobiyskiy incisions of valleys.

2. The proluvial depositions of the Gobiyskiy epoch. These are represented by thick accumulations of sandy-wasting material. In sectors of intensive auriferous content (Kozakovo) they can contain small amounts of gold suitable for mechanized working.

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3. Lower post-Gobiyskiy shingles. These are incised into the strata of proluvial deposits to the lowest horizons and sometimes into the underlying primary rocks or pre-Gobiyskiy shingles. In the auriferous sectors they have commercial quantities of gold even though it may be in a lesser degree than the pre-Gobiyskiy shingles.

4. Upper post-Gobiyskiy gravels. These lie over the proluvial depositions. They are not extensive, since in the majority of cases they were probably eroded by the subsequent downcutting of valleys. They can be commercially auriferous.

5. Clumpy talus. This lies on the mountain slopes or at the foot of mountains over the top of proluvial depositions and the upper post-Gobiyskiy shingles. It has no direct connection with the gold presence.

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THE GOLD GEOLOGY OF KAZAKHSTAN [1]

FOREWORD

There is an enormous amount of material on the geology, intrusive rocks, metallogeny and gold-content of Kazakhstan. A summary of the geological material is given in the monumental work done by a large number of authors "Vostochnyy Kazakhstan" (geology of the USSR, Vol. XX). In spite of the fact that this work is dated 1941 it is already out of date in some respects. The authors have therefore used it with reservations. In particular, the information on intrusive rocks, metallogeny and gold-content were taken from the original sources. The authors found great difficulty in grouping the intrusive rocks of Kazakhstan into ingneous complexes. Most of the original sources do not give such a grouping, and there where it has been given (for example for Rudnyy Altai and Kalba), the authors were not always in agreement with it (for example relating the ore-bearing albite-porphyries to the Zmeinogorskiy igneous complex).

In the solution of these problems use was made mainly of the 1940 and 41 field observations of the authors and the results of studies of several thousands microsections from Kazakhstan in the collection of the VSEGEI. (All-Union Scientific-Experimental Geological Institute).

I. A SHORT GEOLOGICAL DESCRIPTION

Central Kazakhstan (including the Rudnyy Altai and Kalba) with its intrusive and ore complexes was formed mainly during the course of two tectono-magmatic cycles the Caledonian and the Variscian. The pre-Palaeozoic tectono-magmatic cycles created the same crystalline foundation which in most parts of Kazakhstan lies deep beneath the folded Palaeozoic formations and only in isolated small sectors (Kokchetavskiy anticline, Ulutauskiy mountains etc.) emerges on the surface. The intrusive and ore complexes of this foundation are very obscure to us. The Cimmerian (Hercynian?) and Alpine tectono-magmatic cycles appeared on the territory of central Kazakhstan very faintly and lead to only very unessential changes in this structure, mainly by way of faults and very insignificant folding dislocations and to very small scale intrusions by Cimmerian undifferentiated or very weakly differentiated magmas (basalts, andesites).

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1 The present work by Bilibin and Plotnikova was written in December of 1944 as the second part of the research "General Problems of gold Metallogeny".

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The Kokchetavskiy and Ulutauskiy outcrops of the ancient foundation have played a very vital role throughout all the Palaeozoic history of Kazakhstan. They served as the cores around which the folded formations of Kazakhstan were built up, initially in the Caledonian and then in the Variscian epochs of folding. It is debatable whether or not these outcrops were covered over by Lower Palaeozoic seas. It is quite probable that during this or other periods such submergence did occur, but without doubt these outcrops played a role in the geoanticlinal districts with lesser depths of deposits. It is quite probable that here a whole geoanticlinal zone extended from the southeastern fringe which lay on the locality of the present day Chuyskaya depression. The build up of the folded formations in Kazakhstan proceeded, on the one hand, from that geoanticlinal district from the West and wouthwest eastwards to the northeast; on the other hand these folded constructions were perfectly analogically built up also from the outcrop of the ancient foundation in the Gornaya Shoria and the southeastern Altai in a direction from the southeast to the southwest. These two geoanticlinal districts mark off the general contours of the geosyncline which existed on the locality of modern day Kazakhstan during the Palaeozoic Age.

The Caledonian folding tapered the contours of this geosyncline, raising up the Gornoshorkiy block from the southwestern side with folded structures of the Gornyy Altai, and the Kokchetav-Chuyskaya geosyncline zone by folded formations along its eastern and northeastern edges (the zone of Caledonian folding the Stepnyakskiy region; outcroppings of the Caledonian foundation from beneath the comparatively thin cover of the Middle and Upper-Palaeozoic in the Dzhezkazgan-Sarysuyskiy regions, caledonides of the southwestern Pribalkhash'ye). The Caledonian folding changed the character of this geosyncline, converting it into more of an elevated shelf with intensively developed volcanism. During the Variscian Age the only thing that can be considered a geosyncline is essentially a comparatively narrow belt within the confines of the whole extended territory identified by V.P. Nekhoroshev under the name of "Zaysanskaya geosyncline". Sectors between the Zayanskaya geosyncline and the Caledonian folded structures are an area of uplifted shelf. To the northeast from the Zaysanskaya geosyncline it is joined by the territory of the Rudnyy Altai and directly by it is the adjacent part of the Gornyy Altai to the southwest of the geosyncline lies the main part of the Tsentral'nyy Kazakhstan territory.

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Thus, the structure of the entire Kazakhstan geosyncline district shows a definite symmetry: along the edges there are geoanticlinal districts with outcrops of ancient pre-Cambrean rocks; the Gornaya Shoria on the East and the Kokchetav-Chuyskaya on the West. From the interior they are reached by the zones of Caledonian folded structures such as the Gornyy-Altai and the Stepnyak-Dzhil'tauskaya. Even closer to the axial part of the geosyncline lie the areas of uplifted shelf such as the Rudnyy Altai and on the northeast and the Tsentral'nyy Kazakhstan area on the southwest. And finally the axial part of the geosyncline district is connected with Zaysanskaya geosyncline. Thus, qualitatively the structure of the Kazakhstan folded district is fully symmetrical.

However, from the point of view of spacial development of all the enumerated tectonic elements the Kazakhstan folded district is clearly asymmetrical. Its southwestern wing is considerably better traced along its entire strike than is the northeastern: from the southern end of the Chu-Iliyskiy mountains to the point of submergence of the Kokchetavskiy anticline on the north under the Tertian depositions in the Zapadno-Sibirskiy Lowland, a distance of about 1500 kilometers, whereas the extent of the Gornyy and Rudnyy Altai from the boundaries of the USSR on the southeast to their submergence under the Quaternary depositons of the Kulundinskiy steppe on the northwest covers a little more than 400 kilometers. The Caledonian folded margin on the northeastern leg of the folded district is somewhat wider and more clearly expressed than on the southwestern leg. But the main difference consists of an abrupt, irregular development in the area of the uplifted shelf; whereas the northeastern part takes in only the Rudnyy Altai, about 150 kilometers in width, the southwestern part has a width of about 600 or 700 kilometers.

The difference between the northeastern and southwestern legs of the Kazakh folded district is not limited to the variety of spatial development for individual folded elements. The tectonic structures, the facies of deposits, forms of volcanism etc. are also not homologous in the northeast and southwest of the Zaysansk geosyncline. The pre-Cambrian foundation on the southeast apparently steeply plunges under the intensively folded lower Paleozoic sediments. The latter are very thick and have typical geosynclinal facies. They are folded into steep, frequently insoclinal folds, in places they are strongly metamorphosed. In the area of transition to the uplifted shelf, as well as within the boundaries of the latter there are greatly developed fractured dislocations of Variscian Age. They divide the Caledonian and Variscian folded complexes into a series of separated greatly elongated blocks relatively displaced in one or another direction. By means of similar fracture dislocations the Caledonian folded fringe is combined with the area of uplifted shelf and the latter with the Zaysanskaya geosyncline district.

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In the southwest the Pre-Cambrian folded foundation fairly gently submerges under the Caledonian folded structure, due to which the boundary between them is obscure and in plan it has a very intricate configuration. Individual outcrops of Pre-Cambrian foundation are found not only in the confines of the Caledonian folded fringe, but in the confines of the Variscian uplifted shelf, which indicates the comparatively shallow burial of that foundation. An analogical relationships are observed between the Caledonian and Variscian folded complexes: the Caledonian folded margin plunges so gently under the Variscian folded structure that it also produces a very ill-defined boundary between the territories of the Caledonian margin and the uplifted shelf district. The outcrops of Caledonian foundation in the territory of the Variscian uplifted shelf are even more numerous and larger than the outcrops of Pre-Cambrian foundation.

The tectonic structures of the Caledonian folded complex in the southwestern leg of the folded district are significantly more stable and gentle, than in the southeastern leg, and essentially are much more strongly identified from the Variscian structure in the uplifted shelf district. The role of various dislocations in the combination of the Caledonian folded fringe and the Variscian uplifted shelf is considerably less. The thickness of the Lower Palaeozoic sediments in the southwest is considerably less than in the southeast; the facies are distinguished essentially from the sediments of the Middle and Upper-Palaeozoic; deep metamorphism is not a characteristic.

It can be clearly seen from this comparison that the clear asymmetry in the structure of the Kazak folded district existed before the Lower Palaeozoic Age. During the time when in the northeast, on the area of the present day Gornyy Altai, there lay a deep geosyncline downwarp with a thick accumulation of sedimentary matter, while in the southwest, in the area of the present day Tsentral'nyy Kazakhstan, there was an uplifted shelf of approximately the same character as in the Variscian Age. It was only after the completion of the Caledonian folding processes, in the Variscian Age, that the character of the uplifted shelf on both sides of the Zaysanskaya geosyncline became more ore less identical. The presence of clear asymmetry during the Lower Palaeozoic Age indicates that its causes were in existence during the Pre-Cambrian Age.

Apparently, the great intensity of the Variscian intrusive activity is associated with these extraordinarily intensive metallogenic processes in the northeastern leg of the geosynclinal district (Rudnyy Altai, Kalba) and they are in the very closest association with the very tightly compressed, steep tectonic structures of the Caledonian folded foundation, underlying the Variscian formations of that region.

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Individual tectonic areas in the northeastern leg of the Palaeozoic folded zones are so clearly expressed and are so comparatively small in their extent both along the strike and across it that it is pointless to divide them into individual structural units of a lesser order.

In the southwestern leg of the folded zone the position is completely different. The less clearly shown individual structural elements and their very significant size both along the strike and across it make it possible but also necessary to divide them into separate tectonic units of a lesser order. Such a division for all the structural areas can be based on one and the same principle, which is of identifying the sectors of uplifting and the sectors of relative subsidence or downwarping.

Within the boundaries of the Kokchetav-Chuyskaya geoanticlinal zone we can identify three sectors: the Kokchetavskiy anticline, the Ulutauskiy anticline and their intervening sector across the downwarping in the area of the great meander on the Ishim river which can be designated as the Ishimskiy downwarp. Whereas in the confines of both the anticlines the Pre-Cambrian rocks of the crystalline foundation show great development, in the area of the Ishimskiy downwarp they do not emerge on the surface, being covered over by sediments of the Lower and Upper and to some extent the Middle Palaeozoic. Farther to the South the geoanticlinal zone plunges under the youthful sediments of the Golodnaya steppe, and its extension between the Chu-Iliyskiy mountains and the Karatau range in the territory of the Chuyskaya depression is nothing more than a suggestion based on a number of oblique geological deductions.

The Caledonian folded margin has sectors of uplifting and downwarping which are situated analogically to the sectors of the geoanticlinal zone. Together with the Kokchetavskiy anticline to the East of it lies the Stepnyakskoye uplifting of the Caledonian folded margin, combined with the main Taconic folded complex and the large intrusive bodies of Caledonian Age. The Stepnyakskiy uplifting in the South plunges under the Upper-Palaeozoic and Tertian sediments of the Tenizskaya synclinal fold lying parallel to the Ishimskiy downwarp of the geoanticlinal zone. South of the Tenizskaya synclinal fold the Caledonian folded margin again emerges together with the Ulutauskiy anticline. However here it is overlain by the structures of the Variscian folded complex. Nonetheless, large intrusive bodies which are characteristic of the Caledonian margin and are of Caledonian age emerge here from beneath the overthrust Variscian structure in a great many places. Farther to the Southeast, after the slight downwarping of the Sarysuyskaya valley, the Caledonian folded margin again emerges in the mountains of the Betpak-tau, run continually across the southwestern Pribalkhash'ye right down to the Chu-Iliyskiy mountains accompanied everywhere by large Caledonian intrusive bodies.

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In the district of the uplifted shelf one observes a fairly intricate alternation of upthrusts of the Caledonian foundation and synclinal downwarpings which divide them. Southwest of the Zaysanskiy geosyncline and parallel to it lies the Tarbagatay-Chingizskiy upthrust of the foundation. In full accord with the plunging of the Zaysanskiy geosyncline axis cowards the southeast the axis of this upthrust also plunges in a southeasterly direction. Lower Palaeozoic development gradually increases in a direction to the southeast of the district; in the western Tarbagatayit emerges from beneath the middle Palaeozoic sediments only in isolated sectors and near the State boundaries it almost completely disappears.

Southwest of the Tarbagatay-Chingizskiy bulge lies the Pribalkhashskiy synclinal downwarping which converts in the southeast into the Alakul' depression and is filled with Quaternary sediments. Southwestward of the Pribalkhashskiy downwarping lies the North-Balkhashaskoye bulge of the Caledonian foundation. Farther to the southwest is the Zabalkhashskaya depression, filled in with sifting sands, and is an area of obscure tectonic nature. Judging by its position in the upthrusted shelf district, between the two bulges of the Caledonian foundation (Chu-Iliyskiy and the North Balkhashskiy), it is probably a synclinal downwarp (similar to the Zaysansk and the Alakul' dpressions), and not a rigid structure of the anticlinal type similar to the Chuyskaya depression. Thus, in the southeastern part of the Central Kazakhstan Oblast' the upthrust shelf to the southwest of the Zaysansk geosyncline has two bulges (the Tarbagatay-Chingizskiy and the northern Balkhaskskoye), divided by two synclinal downwarpings (Pribalkhashskiy and the nearby Zabalkhashskaya depression). A third bulge to the southwest is the Chu-Ilyskiy mountains, which are related to the district of the Caledonian folded margin.

In the central part of Central Kazakhstan the downwarpings and bulges are oriented less regularly and in places deviate greatly from the northwestern strike of their characteristic shelf in the southwestern part. The most clearly defined areas here are the Verchne-Sarysuyskoe and Boshchelkul'skoye bulges, divided between themselves by an area of fairly deep Karagandinskiy downwarping. The latter bulges under the Tertiary sediments of the Zaysanskaya syncline in the West, in the East it merges into the area between the very similar Boshchekul'skoye and Chuyskaya bulges. The Boshchekul'skoye bulge is separated from the Variscian Selety-Ulentinskiy downwarp from the Stepnyakskiy sector of the Caledonian folded margin. The Seleti-Ulentinskiy downwarp overlies Caledonian structures. The rocks of the Caledonian foundation are here represented by the lower horizons (Cambrain and probably even Pre-Cambrain), but during the Variscian Age a slight downwarping formed on the junction between two tectonic districts in which were deposited Middle and Upper Paleozoic (right down to Permain) sediments and accompanied by small Variscian intrusions.

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The northwestern area of the Pribalkhash'ye, bounded on the southwest by the Caledonian folded margin (Betpak-Tau and Dzhil'-Tau mountains) and on the northwest by the Verchne-Sarysuyskoe bulge and on the East by the North Balkhashskoye bulge, cannot be referred to either a downwarping or to a bulge. Considered in even a limited area it is a typical shelf district. There are neither the large Variscian synclinal folds with any amount of elevated beds of Variscian sediments, nor are there any large outcroppings of the Caledonian foundation. On the contrary, we everywhere find numerous but small in size (both in plan and in elevation) outcroppings of the Caledonian foundation which alternate with small synclinal folds of Variscian sediments of comparatively shallow thickness. In the northeast, roughly in the area of Karkaralinsk, the northwestern Pribalkhash'ye district combines with the Karagandinsk and Pribalkhashskiy synclinal downwarpings.

Such are the secondary tectonic elements which can be identified in the southwestern leg of the Kazakh folded area. All the foregoing about the tectonics of Kazakhstan can be summarized as follows:

1. Northeastern block of Pre-Cambrian crystalline foundation, the Gorno-Shorskaya block.

2. The northeastern Caledonian folded margin, Gornyy Altai.

3. Northeastern district of Variscian upthrust shelf, Rudnyy Altai.

4. Zaysansk geosyncline.

5. The southwestern district of the Variscian upthrust shelf, Central Kazakhstan. Tectonic units of a smaller order are:

A. Caledonian foundation bulge:

(a) Tarbagatay-Chingizskoe

(b) Severo-Balkhashskoye

(c) Boshchekul'skoye

(d) Verchne-Sarysuyskoe.

B. Synclinal downwarpings:

(a) Pribalkhashskiy

(b) Zabalkhashskiy

(c) Seleti-Ulentinskiy

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C. Shelf-like areas: Northwestern Pribalkash'ye

6. Southwestern Caledonian folded margin i.e., the Stepnyak-Dzhil'tauskiy zone. The following smaller tectonic units are distinguished:

A. Zonal Upthrusts:

(a) Stepnyakskoye

(b) Dzhezkazgan-Sarysuyskoye

(c) Dzhil'tauskoye.

B. Zonal Downwarping:

(a) Tenizskaya synclinal fold.

(b) Sapysuyskaya valley.

7. The southwestern district of outcrops of the Pre-Cambrian crystalline foundation,
i.e., the Kokchetav-Chuyskaya geoanticlinal zone.
The following smaller tectonic units may be distinguished:

A. Zonal Upthrusts:

(a) Kokchetavskiy anticline.

(b) Ulutauskiy anticline.

B. Zonal Downwarping:

(a) Ishimskiy downwarp.

(b) Chuyskaya depression (conditionally).

It is quite likely that a similar Caledonian folded margin is seen in the area of the Betpak-Dala downwarp of the geoanticlinal zone, while in the area of the Chuyskaya depression there is a new upthrust.

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Insofar as the interrelationships of the Caledonian and Variscian structures are concerned, this depends entirely on what tectonic district they lie in. In the northeastern leg of the Kazakh folded district the Lower Palaeozoic geosyncline was converted into a Variscian uplifted shelf. Here the Variscian structures clearly over lies the Caledonian both in the area of the Caledonian margin and in the shelf district. However, the intensive dislocation of the Lower Palaeozoic series and the tightly compressed steep folds did not permit the Variscian folded structures to show any distinct strike. The Zaysansk Variscian geosyncline is fully entitled to be considered as an inherited structure, however it is quite possible that it is displaced somewhat to the southwest in relation to the access of the Lower Palaeozoic geosyncline downwarping.

In the southwestern district of the Variscian shelf the Pribalkhash-skiy and the Karagandinskiy downwarpings are clearly inherited from the Caledonian structures. We cannot say the same for the Selety-Ulentinskiy downwarp which is not less clearly superimposed on the Caledonian structures. In areas of uplifting of the Caledonian foundation (particularly in the Boshchekul'skiy) we encounter mainly superimposed Variscian structures. The same may be said for all the southwestern Caledonian folded margin area. Here the Variscian structures everywhere are clearly superimposed on the Caledonian. There is obvious superimposition of the Dzhezkazganskaya synclinal fold of the upper Palaeozoic sediments. The Tenizskaya synclinal fold has an intermediate and rather obscure position. On the one hand the surrounding downfold is of Lower Palaeozoic and probably of even Pre-Cambrian Age. From this point of of view it may be considered as an inherited structure. On the other hand it is coordinated with a transverse downwarp of the Caledonian folded structures and from this point of view it can be considered as superimposed. The comparatively slight thickness of the Middle and Upper Palaeozoic sediments and the insignificant showing of Variscian intrusive activity along the periphery of the synclinal fold sharply distinguish it from such typical inherited downwarps as the Pribalkhashskiy and the Karagandinskiy.

In conformity with the foregoing concerning the structure of the Kazak folded land its geological history appears in the following form. The Pre-Cambrian folding processes, taking place repeatedly and frequently accompanied by intrusions of the most varied kinds of rocks, created the structure of the ancient crystallized foundation underlying the Palaeozoic sediments. This structure (in the broad sense) preceded the deliniation of the various tectonic districts during the Palaeozoic Age, in particular, the geosynclinal downwarpings and geoanticlinal upliftings. Now this deliniation, in its own turn, pre-determined the structure of the folded formations developing during the Palaeozoic time.

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The Palaeozoic history of the Kazak folded land divides into two tectono-magmatic cycles, i.e., the Caledonian and the Variscian. A preliminary discussion is given in the essay on "General problems of sold metallogeny" (Vol.II), the Caledonian and Variscian tectono-magmatic cycles of Kazakhstan divide into the following stages. The Cambrian and Silurian Periods correspond to the stage of geosynclinal development of the Caledonian tectono-magmatic cycle. This stage was interrupted by two phases of folding of secondary importance, the Salairian and the Taconian, which did not stop the geosynclinal development but only slightly complicated the general trend of the geological processes. It is characteristic that both this and other phases of folding are associated with intrusions of norite-trondhjemite igneous formations. The Neo-Caledonian is the main period of orogenesis for the Caledonian tectono-magmatic cycle of Kazakhstan. At the present time we do not have criteria for differentiation of the Ardennes and Erian phases of folding in Kazakhstan, but it is quite probable that a considerable part of this territory was affected by one andthe other. The Neo-Caledonian folding is the turning point at which there was an abrupt change in the direction of processes during the Caledonian tectono-magmatic cycle. A considerable part of the geosynclinal districts (Gornyy Altai, Stepnyak-Dzhil'tauskaya folded zone) were drained and converted into ore zones which later underwent only comparatively slight ingressions by seas. The Neo-Caledonian folding is associated with the appearance of oxidizing intrusions of granitoid intrusive formations which were particularly plentiful and large in extent along the margins of those parts of the geosynclinal district undergoing drainage.

The Devonian Period is a stage of post-orogenetic development for the Caledonian tectono-magmatic cycle. During this age there were isostatic counter-balancing and intensive erosions of Caledonian folded structures and post-orogenetic magmatic activity which was both intrusive and effusive took place. The post-orogenetic intrusions of this age include the Caledonian dioritic intrusions and intrusions of slightly increased alkalinity. However, the normal course of the Caledonian tectono-magmatic cycle was interrupted during the period of its completion by a new subsidence of the folded zone, which brought with it the beginning of a new Variscian tectono-magmatic cycle. To this subsidence, which did not permit a normal conclusion to the Caledonian cycle, we owe the fact that within the Kazak folded land we do not find alkaline rocks of Caledonian age and particularly intensive showings of Caledonian mineralization, which is normally coordinated to the very last stages of the tectono-magmatic cycle.

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The Sudeten folding phase corresponds to the period of the main orogenesis during the Variscian tectono-magmatic cycle. It is quite probable to it divides into several smaller phases of folding, following one after the other at relatively short intervals. However, it is not possible to discuss this reliably because of the almost complete cessation of the sedimentation processes following the Lower Carboniferous Age and the lack of evidence concerning the stratigraphic divisions of nearly all the Middle Carboniferous. For the same reason it is not possible to pass judgement on the traces shown of the Asturian phase of folding in Kazakhstan and to distinguish them from the Sudeten phase.

The epoch of the Middle and Upper Carboniferous Ages and all of the Permian are, for the Kazakhstan folded country, a stage of post-orogenetic development in the Variscian tectono-magmatic cycle. It led to the renewal of sedimentation processes and extended somewhat the post-orogenetic development of the folded land, causing the appearance of at least two secondary and gradually ceasing phases of folding. In connection with the renewal of the sedimentation processes these folding phases can be dated more accurately than in Middle Carboniferous. However, this subsidence was insufficient to reverse the course of the tectono-magmatic processed to the bygone stage and therefore must be considered as only a more complex phase of the Variscian cycle and not as an independent Tyan'-Shyan' tectono-magmatic cycle.

In contrast to the Caledonian cycle the Variscian tectono-magmatic cycle is completed, and therefore we find in it alkaline rocks which are absent in the Caledonian cycle and also extraordinarily intensively developed metallogenic processes taking place in the terminal stages of the cycle, which are completely without comparison in scale of mineralization in the Caledonian metallogenic processes.

The Cimmerian tectono-magmatic cycle, as we have already observed, was very weak in Kazakhstan and was manifested only in very small dislocations and insignificant eruptions of weakly differentiated basic magmas, which did not cause any metallization whatsoever. In other words, in Kazakhstan it has a typical platformal character. Traces of magmatic activity associated with the Alpian cycle are unknown in Kazakhstan.

Having discuss the main branches of the Caledonian and Variscian tectono-magmatic cycles in ours sense of the term, we can more accurately discuss the different geological processes taking place during the main stages of these two cycles.

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As has already been mentioned the geological structures created during the processes of Pre-Cambrain folding predetermine the distribution of the main tectonic elements in the Lower Palaeozoic. A broad geosynclinal district formed on the territory of the present day Kazakh folded land during the Cambrian Age, it was bounded on the northeast by the Gorno-Shoria block of Pre-Cambrian rocks, and on the southwest by the Kokchetav-Chuyskaya geoanticlinal zone with outcroppings of the ancient Pre-Cambrian foundation. The structure of this geosynclinal zone was sharply asymmetrical. The gorno-Shoria block dropped off in the direction of the geosyncline with a steep cliff, which favored the existence of a deep geosynclinal downwarp parallel to it and with a stable, bowed bottomamd the accumulation of thick beds of deep-water, mainly argillaceous sediments. On the other hand, the crystalline foundation of the southwestern leg of the geosyncline subsided in a northeasterly direction extraordinarily gently, which favored the existence, over all the territory of present day Tsentralnyy Kazakhstan, of a shallow sea with intensive vulcanism. According to N.G. Kassin "there was a shallow sea here with many continental and volcanic islands (of the archipelago), the erosion material from the volcanic islands and the volcanic eruptions plays a very important role in the sediments here: limaceous reefs formed here and circling the shores of the mainland and the islands (formed of corals, stomatopods and archaeocyatheans); erosion and destruction in many places produced a considerable amount of fragmentary carbonate material, accumulations of limaceous and chitinous parts of trilobites and brachiopods formed marlaceous interlayers". In conformity with this all of the Tsentralnyy Kazakhstan is characterized by shallow water Cambrian sediments of a tufo-arenaceous character with beds of limestones and marls and deformation of a series of siliceous and quartzitic-schistose rocks.

The development directly southwards from Tsentralnyy Kazakhstan, in the Karatau and the northern chains of the Tyan'-Shan' mountains of great Cambrian series of mainly schistose nature indicates that the Tsentralnyy Kazkhstan crystalline block (or platform) dropped off to the South with the same kind of steppe escarpment as did the Gorno-Shoria towards the Kazakh geosyncline. Thus, the Palaeozoic history of Tsentralnyy-Kazakhstan developed on a block or platform of comparatively rigid Pre-Cambrian foundation, which gently subsided to the northeast and steeply dropped off in a southerly direction. The presence in the Lower Palaeozoic Age of the deepest and most mobile downwarpings both in the immediate proximity of this block, such as the Gorno-Shoria on the northeast and the Sredne-Asiatskaya on the south, indicates that the movements of the Kazakhstan block of the ancient blocks to it, and the great mobility of the bordering downwarp between them very probably is largely explained by the independence of the tectonic movements of individual blocks in the ancient foundation. At the same time, the geological processes which began during the Palaeozoic in various parts of the Kazak folded country are interconnected by the unity of the ancient crystalline foundation underlying the Palaeozoic series.

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This basic feature of the Kazak folded country, the monolithic character of its ancient crystalline foundation and the independence of its movements from the movements of the adjacent Gorno-Shoria and Sredne-Asiatskaya blocks to a significant degree endures even now. In any case, the Alpian fracturing dislocations nearly completely vanish within the confines of the Kazak folded country, but they are very clearly shown in places where it adjoins its neighboring blocks of the ancient foundation, i.e., in the northern chains of the Tyan'-Shan' and in the Gornyy Altai, where they caused the formation of steep mountainous relief. The presence of fracturing Alpian dislocations in the Dzhungarskiy Alatau and Vostochnyy Tarbagatau indicates that the eastern boundary of the Kazakhstan block of the ancient foundation occurs in the region of these ranges. Due to the peculiarities described above, the Kazakhstan folded country is characterized by not only unity of geological structure, but to a considerable extent by unity of modern relief as well. Thus, there is considerable geological basis for considering the Kazakhstan folded country separately from the Mugodzhar and the ranges of Central Asia including the Dzhungarskiy Alatau, but there is firm geological basis for considering it together with Kalba and the Rudnyy Altai.

Let us return to the discussion of the geological history of Kazakhstan during the Lower Palaeozoic Age. The absence of the Upper Cambrian in Turkestan and the Southern Urals on the one hand, and east of the Kazak folded country on the other hand, and the presence of conglomerates in the western sectors of Tsentralnyy Kazakhstan indicates the probability that the Salairian folding phase occurred here. The presence of Upper Cambrian in the northern parts of the Kazak folded country is evidence that the Salairian folding took place mainly on its periphery. Evidently, the Salairian folding must be connected with the intrusions of plagiogranites and amphibole quartz-diorites of the Anderkenynskiy massif in the Chu-Iliyskiy mountains. These intrusions broke through the gneisses and produced shale in the Lower Silurian conglomerates. Their indisputable relationship to the norite-trondhjemite intrusive formations, which always appear in association with subsidiary orogenetic phases of the geosynclinal period, makes it very probable that they are actually associated with the Salairian rather than the more ancient Pre-Cambrian phases of folding.

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Salairian folding did not essentially changed the nature of the Kazakhstan geosynclinal district. During the Ordovician, thick beds of comparatively deep water sediments continued to accumulate along the periphery of that district, as well as schistose-beds in the Gornyy Altai and schistose-arenaceous-dolomitic beds in the Karatau and the northern ranges of the Tyan'-Shan' mountains. At the same time, in Tsentralnyy Kazakhstan the same shelf conditions remained with their accumulation of fairly shallow beds sediments that were of fresh-water composition, sandstones, conglomerates, porphyry lavas and their tuffs, siliceous slates and subsidiary horizones of limestones and so on. Very characteristic are the underwater volcanoes and the extrusions of basic lavas of spilitic formation. This phenomena was particularly intensified during the Caradocian Age, when besides effusions, there began to appear sub-volcanic intrusions of the same magmas in the form of interlamellar sills and small laccolithic bodies (Dzhusalinskiy intrusive complex in northern Kazakhstan).

The Taconian folding which began on the boundary of the Ordovician and the Gottlandian has much in common with the Salairian folding phase. They developed most intensively along the western and southwestern boundaries of the Kazak folded country, but it is also noticeable in the northeast (Altai) and in the Central parts. Directly South of the Kazak folded country, in the Karatau and the northern ranges of the Tyan'-Shan' mountains, this folding resulted in the omission of a considerable part of the sediments from the upper Salairian and the stratigraphic section. The intrusions of Taconian Age on the territory of Kazakhstan are particularly intensively manifested in the northern parts, where they form the largest intrusive bodies of the Kryk-Kudukskiy intrusive complex in the Stepnyak part of the Taconian folded zone. This complex, like the Anderkenynskiy in the Chu-Iliyskiy mountains, relates to the norite-trondhjemite intrusive formation. A more careful study of the intrusive rocks of Kazakhstan will very likely make it possible to determine analogical rocks in other parts of the southwestern Caledonian folded margin of Kazakhstan. In the more central parts of Kazakhstan the larger intrusive rocks of Taconian age are unknown. Acidic and neutral intrusions are represented by small bodies of Taconian age and in some cases of a generally Caledonian age which cannot be determined accurately. The most characteristic for this period in the Central parts of Kazakhstan was the appearance of ultrabasite intrusions which are found in nearly all the Caledonian foundation outcrops, but due to the slight intensity of the folding they are everywhere of small size.

The Neo-Caledonian folding, corresponding to the period of main orogenesis, wrought very vital changes in the Kazak geosynclinal district. Similar to the preceding folding (the Salairian and Taconian), it was manifested most intensively on the margins of the geosynclinal district, i.e., in the Gornyy Altai and in the Stepnyak-Dzhil'tauskaya folded zone. Both these marginal sectors of the geosyncline underwent drainage and later in their history they experienced only comparatively slight ingressions by the Middle and Upper Palaeozoic seas. All the remaining part of this geosynclinal district also became drained and marine Lower Devonian sediments are absent from all this enormous territory.

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The whole extent of the southwestern (Stepnyak-Dzhil'tauskaya) folded zone was intruded by thick Neo-Caledonian Age intrusions, and this time they were not of basic magmas and their differentiates, but neutral and acidic rocks (Borovskiy igneous complex of Northern Kazakhstan and its analogies in the more southern regions). These intrusions, which belong to a granitoid intrusive formation, begin with granodiorites and end with granites, and some leucocratic, aplitic and alaskitic rocks. Similar to the preceding phases of folding, these intrusions are particularly characteristicly confined to the marginal folded zone (Stepnyak-Dzhil'tauskaya) and are completely absent or completely insignificant in the more central parts of the Kazak folded land. Even from the geological map of the Soviet Union, drawn to a scale of 1: 2,500,000, compiled, in sense of petrological material, very poorly and even primitively and without any attempt whatsoever at explaining or interpreting the material, it is easy to see how large the bodies of Caledonian intrusive materials are in the Stepnyak-Dzhil'tauskaya folded zone, how little Variscian intrusive material there is here and, on the contrary, how sharply predominant the Variscian intrusive rocks are in the Central parts of Kazak folded land. The greatest Variscian intrusion in the Stepnyak-Dzhil'tauskaya zone are those intrusions which lie to the northeast from Dzhezkazgan, but on the right bank of the Sarysu river. However, P.L. Merkulov in his work on the geology of the Syrysu-Tenizskiy watershed considered just this very region of intrusion as "The southern block of the Variscian platform", from which we may conclude that the intrusions actually are of Caledonian age.

The entire territory of the Kazak folded land underwent intensive volcanic activity during all of the Lower Devonian period and this took place under dry land conditions due to the drainage of the whole territory. As a result of this during the entire Lower Devonian Period there accumulated extraordinarily thick beds of lavas, tuffs and tuff breccia. In contrast to all the previous manifestations of volcanic activity, at this time the first acidic lavas began to play a vital and frequently predominant role in the lava eruptions. This is closely associated with the appearance, during the neo-Caledonian age, of neutral and acidic intrusions but not of the basic magmas and their differentiates as was the case in intrusions of an earlier Age. The first half of the Devonian Age, quite probably, contained small intrusions of diorites and syenito-diorites, which are known in the Stepnyak region. Also related to the first half of the Devonian are the thick conglomeratic formations which are associated with the erosion of the Caledonian folded structures.

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New subsidence of the land during the middle Devonian started the Variscian tectono-magmatic cycle. During the Devonian Age accumulations formed everywhere of moderate, varying from region to region, beds of fresh-water lithological composition i.e., conglomerates, sandstones, marls, limestones, porphyry and particularly albitophyric lavas, their tuffs and tuff breccia. Only the thick slate series which are characteristic for the deep geosynclinal downwarps are absent in this period. During the Variscian tectono-magmatic cycle not only the Tsentral'nyy Kazakhstan, but the south-western Altai also preserved this characteristic shelf. If we were to exclude the manifestation of folding and intrusive activity at the beginning of the Devonian, which refers to the Caledonian tectono-magmatic cycle, then all the remaining period of the Devonian Age did not have any significant folding or intrusive activity. (Footnote 1: The history of the geological development of Kazakhstan during the Palaeozoic is very sketchy. It does not correspond for example, to the history of the development of the Rudnyy Altai, where sedimentation and magmatic activity was not observed for the Lower Devonian, but they were very widely manifested during the post-lower Devonian Age. Editor)

On the boundary between the Devonian and Carboniferous Ages we observed manifestation of the Bretonian phase of folding in the Dzhungarskiy Alatau with accompanying intrusions by a variety of rocks, from basic and ultra-basic to granodiorities and normal granites. This great range in the petrographic character of the rocks permits a fair degree of certainty in the statement that in this case the intrusions are not granitoid intrusive formations, but gabbros and norite-trondhejmites as in the Caledonian tectono-magmatic cycle. In the remaining parts of the Kazak folded land we do not observe manifestations of the Bretonian phase of folding and its associated intrusions. On the contrary, the Devonian everywhere so gradually goes over to the Carboniferous sediments that it normally is very difficult to show a clear boundary between them.

It is therefore perfectly natural that in the Lower Carboniferous a large part of the Kazak geosynclinal district continued to preserve the same shelf conditions that were present during the Devonian Age. However, in connection with the terminated erosion of Caledonian folded structures, the marine conditions are better expressed throughout the entire district. The predominant type of sediment is sandstone interchanged with slates, limestones, marls, and in places with an admixture of tufogenic material. Psephitic conglomerate sediments are not charcteristic, and laval flows play a clearly subsidiary role. The Zaysansk geosyncline which began to form during the Devonian Age, was deepened and it acquired an accumulation of thick series of argillaceous sediments. Towards the end of the Lower Carboniferous Age, in association with the reduction in depth of the seas, we observe intensive coal accumulation.

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The Lower Carboniferous contains two maifestations of orogenetic processes, at the beginning of the Upper Tournasian and during the Middle Visean. Volcanic activity is associated with the Tournasian movements, there is an interruption in sedimentation and accumulation of conglomerates. Associated with the Visean movements, in addition to the foregoing, there are observed intrusions of diorites and granodiorites in the Saury (Saurskiy intrusive complex) and small bodies of granodiorites in the Severnyy Pribalkhash'ye. It is considered that both these periods of orogenetic movement did not create any tangible discordances. However, the formation of intrusive bodies during the Visean age is evidence against such a suggestion, and the absence of visible discordances must be accounted for merely by insufficient observation. Subsequent manifestations of orogenetic movement are confined to the Sudeten phase of folding, which is the main period of orogenesis for the Variscian tectono-magmatic cycle. On the basis of this we may consider it quite probable that the Zmeinogorskiy intrusive complex of the Rudnyy Altai, which is very typical of the norite-trondhejmite intrusive formation, was formed in association with Visean dislocations, since we do not know of a single instance when this formation manifested itself in association with the main orogenesis, the more so in connection with subsequent orogenetic phases at the end of the tectono-magmatic cycle, which is suggested for the Zmeinogorskiy complex by some investigators who are attempting to associate it with the orogenetic phases of the Permian.

The orogenic movements which burst forth at the very beginning of the Middle Carboniferous (Sudeten phase of folding), drained all of the geosynclinal district. During the Middle Carboniferous period the continental conditions predominated everywhere and they were accompanied by intensive erosion of the Variscian folded structures. The accumulations of enormous masses of clastic material took place somewhere beyond the boundaries of the Kazak folded country. For this reason we do not find any deep conglomerate series of Middle Carboniferous age. The Sudeten phase of folding was accompanied by great and copious intrusions of granitoids mainly composed of normal granites with some alakites. This stage of granitoid intrusion is not associated with any significant mineralization. Undoubtedly, of much later origin are the intrusions of porphyry and biotitic granites (the complex of micaceous granites of N.A. Eliseev) and the development of aplitic facies with which the Gornyy Altai, Kalba and Tsentral'nyy Kazakhstan are associated by rare metal mineralization. The close genetic association of similar leucocratic granites, which are rich in volatile (so-called pneumatolytic) granites, and intrusions of normal granitoids in all the ore-bearing regions, where they are developed, leads us to think it is more probable that in the Tsentral'nyy-Kazakhstan they more likely followed behind the intrusions of normal granitoids, i.e., that they are associated with the Middle Carboniferous (quite likely the Asturian (Austrian ? sic) orogenic movements, and not with the Permian phases of folding as is assumed by many investigators without sufficient basis in fact.

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New subsidence of the folded land during the Upper Carboniferous and Lower Permian took in mainly the Zaysansk geosynclinal district and its marginal areas, whereas in the confines of the remaining part of the folded country, mainly in its peripheral sectors, which during the main phase of Variscian orogenesis did not undergo very strong folding can to some extent be considered as piedmont depressions. These include the sectors mainly on the western and northwestern fringes of the Kazak folded country, the Salety-Ulentinskiy downwarp, the Tenizskaya synclinal fold and the Dzhezkazganskiy region. In the remaining, more central parts of the Kazak folded country this subsidence was considerably less important.

The sediments of this period of subsidence everywhere begin with basal conglomerates, while the higher horizons are represented mainly by sandstones with secondary layerings of marls, limestones, argillaceous slates containing vegetable matter, coaly shales and coals. The absence of thick conglamerate series indicates that the Variscian folded structures were to a considerable extent destroyed by erosion prior to the beginning of this subsidence. The upper most horizons of this Upper Paleozoic series relates to the Lower Permian. This series is noticeably dislocated, probably, during the Saalian (?) phase of folding and in all the area of development it is interrupted by intrusions of red alaskite granites. It is distinctly discordantly overlained in the Zaysansk geosynclinal district by a bed of porphyries, which are conditionally dated to the Upper Permian Age. Since the porphyry series is also slightly dislocated, it is necessary to allow that the Pfaltzian (?) phase of folding could also have taken place in this region, it terminates the Variscian tectono-magmatic cycle. It is quite probable that this phase of folding is associated with the appearance of the Semeytauskiy magmatic complex.

Beside the main showings of intrusive activity described above, the Variscian tectono-magmatic cycle abounds in the manifestation of weak intrusions, the chronological position of which is even less clear than the position of many batholithic intrusions. By the way, the determination of age of small intrusions is of great importance since they are normally associated with higher ore content. The small intrusions at the end of the magmatic cycle follows behind the batholithic intrusions. However, the presence of the Upper Paleozoic subsidence and subsequent intrusions of red alaskite granites, if not of fully batholithic nature, then quite similar to it, have significantly complicated the probelm. There is no basis on which to consider all the small intrusions to be younger than the red alaskite granites. On the other hand, some data indicate that part of the small intrusions followed behind the batholithic intrusions of the Middle

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Carboniferous, and another part followed behind the red alaskite granites. At what stage the development of the small intrusions was interrupted by a new subsidence of the land during the Upper Carboniferous, at what time the intrusions of higher alkanility and typically alkaline rocks appeared, or whether they followed behind the red alaskite granites, can only be determined after appropriate field and paper studies have been conducted. A more detailed discussion of the problem of small intrusions will be touched on by us in a subsequent chapter.

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CHAPTER II

Igneous Complexes

We consider the basis for an analysis of the metallogeny of any ore-bearing district or region to be an idea about the igneous complexes or related (co-magmatic) groups of intrusive rocks which, being closely united in time, are inter-related by a common deep magmatic hearth and many petrographical and petrological features. The concept of igneous complexes was sufficiently well developed by us in the first part of this work and therefore we shall not dwell on that topic any further.

A study of the geological and petrological literature on Kazhakhstan unfortunately reveals that there is little on which to base a grouping of the intrusive rocks into separate complexes. Most of the works describe specific petrographically differences of rocks, completely independent of the geological relationships among them. In some works petrographiclly similar rocks (for example granites) of different geological age are described together. Small intrusions are as a rule united into a single common group, completely without consideration for their petrological features and relative age. In the great majority of works they are considered to be the products of granitic batholiths, closely associated with them petrologically, metallogenically and with respect to age. It therefore frequently happens that if the age of the granitic batholiths is determined comparatively accurately it is entirely mechanically applied to the age of the lesser intrusions, which in many cases is completely out of accord with reality. On the other hand, in other cases the age of the small intrusions is improperly applied to the batholiths which are actually considerably earlier forms, than are the small intrusions. All this has introduced an extraordinary amount of confusion into the petrology of Kazhakhstan, which can only be cleared up after many years of hard work both in the field and in the office.

We identified the igneous complex of Kazhakhstan as follows, based on our works in Severnyy Kazakhstan during 1940 and 1941, when we established and described the Caledonian igneous comples: Kryk-Kudukskiy, Borovskiy, Stepnyaksiy and Atansorskiy: the Variscian: Bayanaul'skiy and Maykainskiy. In addition, we recognized the igneous complexes identified and described by other workers: the Dzhusalinskiy determined by the workers of the Kazzoloto Trust as an addition to our Caledonian complexes; the Ishimskiy complex of A.N. Zavaritskiy; the Semeytauskiy of N.N. Gornostaev; the Zmeinogorskiy complex and the complex of micaceous granites of N.A. Eliseev and finally the Saurskiy complex of V.P. Nekhoroshev. In addition to the twelve igneous complexes described by various authors on the bais of appropriate field observations, we also identified a number of igneous complexes as a result of checking data in the literature, this naturally, is much less reliable in many cases.

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We shall state beforehand that in identifying these complexes we did not blindly follows the description of field geological observations which are given in one or another geological work on Kazakhstan. Indisputable facts were checked by us and placed at the foundations of our own theories. Interpretations of facts and subjective opinions were dealt with as we saw fit. Following these preliminary remarks we shall proceed to a discussion and description of the igneous complexes identified by us, having arranged them as far as possible in chronological order.

1. Anderkenynskiy igneous complex (Chu-Iliyskiy mountains) is the earliest of the igneous complexes which we can with sufficient reliability assign to the Paleozoic Age. In the volume "Eastern Kazakhstan" the rocks of this complex are given Proterozoic age on the basis of the fact that they breakthrough the rocks of the Proterozoic and produced the shingle in the Lower Silurian conglomerates. In this connection it is noted that associating the rocks of this complex with the inter-Proterozoic phase of orogenesis is as justifiable as with the Proterozoic-Paleozoic. With reservations we consider the age of this complex to be Salairian on the basis of the following considerations. The petrographical description of the rocks of this complex shows without doubt that they belong to the norite-trondheijmite intrusive complex. Batholitic intrusions of this formation always occur in association with the very earliest phases of orogenesis in the course of the tectono-magmatic cycle. The literature does not contain any information for either Kazakhstan or for its adjoining regions to indicate that the Proterozoic tectono-magmatic cycle continued without interruption into the Lower Paleozoic and ended there. If the Anderkenynskiy intrusions actually were Proterozoic, then they should have been followed by numerous intrusions by all the later stages of the Proterozoic tectono-magmatic cycle. However, we find no traces of such intrusions in the region. On the contrary, the manifestation of the Salairian phase of folding in the immediately adjacent regions makes it very likely that the Anderkenynskiy intrusions are of Salairian age which is also fairly well in agreement with their petrographical features.

Predominant in the composition of the Anderkenynskiy igneous complex are plagiogranites composed of acidic plagioclase, quartz and biotite. A very strong characteristic is the small quantity or complete absence of alkaline feld spar. Non-ferrous minerals are very slight in amount, and the rocks have a leucocratic character. Accessory minerals consist of apatite, sphene and ore-minerals. Cataclastic transformations are characteristic, they are expressed in the overall shaling of the rocks, the adrupt quenching of quartz, the orientation of chloritic pseudomorph in one direction and the appearance of zones of detritus formation in another.

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As secondary developments in the Anderkenynskiy igneous rock mass there are found amphibolic quartzitic diorites, composed of oligoclase, quartz, green amphibole and biotite with accessory sphene and apatite. The second sector similar in composition to the pre-Silurian intrusive rocks (biotitic plagiogranites) occurs in the mountains of the Dzhil'-Tau, and on the southwestern slopes of the Chagyrly mountains.

The clear predominance of plagioclase and the insignificant role of potassic feld spar in acidic rocks, the abundance of quartz in dioritic varieties, the appearance of cataclasm all this puts the Anderkenynskiy intrusive complex nearer to the described below Kryk-Kudukskiy complex of Severnyy Kazakhstan, which is a typical representative of the norite-trondhejmite intrusive formation, but is clearly of Taconian age.

2. The Dzhusalinskiy igneous complex was identified and described in the works of the Kazzoloto Trust by E.I. Rytsk and N.A. Fogel'man in the development and completion of the work of the authors of this particular compendium on North Kazhakhstan in 1940. According to the data provided by these investigators, the complex consists of gabbro, gabbro-diabase, leucocratic granodiorites and plagiogranitic porphyries. These rocks form small bodies which are subsidiary to the folding, and are characterized by strongly developed mylonization. The age of complex is considered to be Caradocian.

On the basis of the brief data available to us, we suggest that the described complex is a very typical representative of the small hypabyssal (often subvolcanic) intrusions of spilitic magmatic formation; it formed in very close spatial and genetic association with the lava flows of that formation. The Caradocian age of the complex agrees very well with the revival of volcanic activity at that time. Useful minerals have not been found at the present time in association with the Dzhusalinskiy igneous complex.

The Dzhusalinskiy igneous complex was identified on the basis of geological explorations in the Stepnyakskiy auriferous region (Stepnyakskoye uplifting in the western Caledonian folded margin). But its extent is probably considerably larger. Since the formation of the complex is not associated with any definite phase of orogenesis, but on the other hand, it is associated with a geosynclinal situation, its development can be anticipated in all those regions of Kazakhstan where there was intensive volcanic activity during the Caradocian age. In particular, we can include in this complex the Uchkul' laccoliths of quartzitic diorite-porphyries, which were described by D.S. Korzhinskiy for the Maykainskiy region. These intrusions

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lie within a strongly dislocated Lower Salairian series of porphyries, tufogenic rocks and jaspers. The intrusions are concordant. The largest of these has a length of 15 kilometers and an apparent thickness of 1.5 kilometers, the smaller one measures 8.5 x 1.5 kilometers. They drop off steeply. The diorite-porphyries contain, within a microgained quartz containing basic mass, large (up to 5 to 10 millimeters) shot of significant quantities of albitized andesite and common green amphibole. D. S. Korzhinskiy considers these intrusions to have formed in close association with the Silurian effusions.

In all probability smilar igneous bodies are to be found widely distributed over the territory of Kazhakhstan.

3. The Kryk-Kuduksiy igneous complex was identified by the authors during a study of the intrusive rocks of Severnyy Kazakhstan within the confines of the Stepnyakskiy part of the Taconian folded zone where, incidently, it is most fully shown. In this area large intrusive bodies are related to it, such as Kryk-Kudukskiy (directly West of the Stalinskiy mine), the Arkalykskiy (northwest of the mine at Bes-tyuba) and many others. Farther East, within the confines of the Boschchekul'skiy uplifting of the Caledonian foundation (Maykainskiy and Bayanaul'skiy regions) small intrusions of this complex were determined by the authors in the region of the Tort-Kuduk deposit and South of the Aleksandrovskiy mine, which does not exclude the possibility of wider distribution of the complex within the confies of these regions in the form of small and far from well represented intrusive bodies. Probably, this complex includes numerous intrusive bodies of gabbroid rocks in the Boshchekul'skiy region.

The complex is best represented in the Kryk-Kudukskiy intrusive body where it includes gabbro-norites tonalites, adamallite, trondhjemites alaskite, aplites with pegmatitic separations. Other intrusive bodies have only individual or a few members of this complex. The chronogical succession of the rocks is common, from basal to acidic, and the contacts between various rocks were clearly intrusive. Mention must be made however of the absence of cool contact layers, which indicates the short interval of time between the individual stages of intrusion and the significant depths of their cooling. The petrochenical rocks of this complex are characterized by high saturation with alumina for the primary (norite) magmas, which is expressed in the increase of feldspathic limestones and reduced role of plagioclase and, on the other hand, the reduction of pyroxene in it, i.e., in the development of rhombic pryoxene. The latter causes early formation of biotite, which had already appeared in some gabbro-norites and, absorbing most of the calcium from the melt, at the same time reduced the role of the potassic feld spar. These properties are well shown in all the rocks of the complex and confirm the genetic association among them.

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The shape of the intrusive bodies is clearly batholithic, the dimensions run up to tens of kilometers in length, for example, the Arkalykskiy intrusive body is 90 kilometers long and 30 kilometers wide. The boundaries between earlier rocks inside the intrusive body and its outline is very irregular. The smaller intrusive bodies (Tort-Kuduk etc.) are represented by one or two members of the complex and their shape is frequently concealed by conjoint development of much later Variscian intrusions.

A characteristic feature of all the rocks in the complex is cataclasmic development in them, which appears comparatively uniformly over all the area of the intrusive body. It is most clearly expressed in rocks which are richest in quartz.

The age of the Kryk-Kudukskiy complex is determined to be Taconian on the basis that the rocks of the complex break through and metamorphose the deposits of the Lower Silurian, but the shingle of these rocks was found by R.E. Kvatkovskiy in the conglomerates of the faunistically characterized Upper Silurian series on the Seleta river. In the Tort-Kudukskiy intrusive body shingle of trondhjemite and basal conglomerates of the Upper Silurian were also found lying directly on the rocks of the intrusive body.

It is quite probable that in other parts of southwestern Caledonian folded margin rocks of the Kryk-Kudukskiy igneous complex are also well developed. P.L. Merkulov notes that for the Sarysu-Tanizskiy watershed the Caledonian intrusion divide into two sub-phases: associated with the first are granodiorites, quartzitic diorites and diorites, with the second, and later, there are granites, granophyres, granito-phorphyries and apparently syenites. In the volume "Eastern Kazhakhstan" in addition, it is stated that in the Sarysuyskiy region the Caledonian granodiorites and diorites normally occur together with gabbro and serpentine. These properties strongly indicate the probable relationship of these rocks to the Kryk-Kudukskiy complex or to one similar to it.

In the Dzhezkazgan-Ulutauskiy region we can relate to this complex the quartzite diorites which are frequently found among the ancient metamorphosed series, and often also among the Lower Paleozoic effusive series. These grey and dark-grey rocks are somewhat suggestive of amphibole slates, from which they are distinguished by a lighter color and the predominance of feld spar in the quartz. Less frequently encountered are the granodiorites in which is observed some gneiss content particularly on the peripheral parts of the blocks. It consist of plagioclase, a significantly lesser amount of microlite and green amphibole, in place of which there is sometimes brown biotite, and quartz with wave-like quenching. Sometimes gabbro-diorites are found together with the quartzitic diorites.

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In the mountains of Dzhil'-tau and the adjacent regions of Chu-Balkhash-Iliyskiy watersheds there is wide spread showing of Caledonian gabbro, gabbro-norites and gabbro-diabases. These are undoubtedly analogous to the Kryk-Kudukskiy intrusive complex. It is quite likely that they are genetically associated with some Caledonain amphibolic granites and granodiorites in this region. Charactetistically, the Caledonian granitoids in the Dzhil'-tau montain area form colossal intrusive bodies, which are probably the largest in all of Kazakhstan.

4. The Tekturmasskiy igneous complex unites the ultrabasite intrusions of Caledonian age. They are found in almost all the upthrust of the Pre-Cambrian and Caledonian foundation. They are most frequently expressed as serpentines, surrounded by a thick fringe of secondary quartzites. The unmetamorphosed rocks are represented by peridotites of the lherzolite and wehrlite types with pyroxenites of websterite composition. Dunites are present as a rare exception. Normally the ultrabasites are accompanied also by the development of olivinetic gabbros, gabbro-diorites, and sometimes even more acidic rocks right down to granodiorites and plagiogranites. However, all these rocks play a clearly subsidiary role in comparison with the ultra-basites themselves. Frequently an igneous core occurs which is composed of ultrabasites surrounded by a rim of gabbro or more acidic rocks. The intrusive bodies are criss-crossed by numerous dikes of diabases, gabbro-diabases, pyroxenites, diorite-porphyries. It is quite likely that the dike suites of ultrabasites contain some aplites and albitopheres.

The ultrabasites themselves has already been stated, are frequently serpentinized. The rocks of the dikes are frequently converted by the processes of autometamorphism into granites, pyroxenites, vesuvianite, actinolites and other metasomatites. The formation of small deposits of fairly high quality magnesite takes place under the influence of surface processes.

The shape of the intrusive bodies is most frequently concordant Lamellar or laccolithic bodies are usually of fairly small size, running along the strike of the folding. The largest sizes of intrusive bodies are known in the area of the Boshchekul'skiy bulge, where they achieve 50 kilometers in length and a maximum width of 10 kilometers. However similar large bodies are an exception and the greatest length does not exceed 10 or 15 meters. The district of the Boshchekul'skiy bulge is a region of greatest development of ultrabasite intrusions. Here they form a whole belt of separage intrusions, extending to the northeast for approximately 125 kilometers. In the district of the Verkhne-Sarysuyskiy bulge, South of the Karagandinskiy basin, in the Tekturmas mountains and elsewhere the hypabyssal intrusions form a belt of about 90 kilometers in length. They were studied here by I.F. Trusova.

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Less prominent intrusions of ultrabasites are known in the areas of the Kokchetavskiy anticline (Iman-tau), in the mountains of Eremen'-tau, in the Ulutauskiy mountains, in the Dzhil-'tau mountains, in the Severo-Balkhaskskiy uplifting of the Caledonian foundation, in the Murdzhik mountains in the area of the Chingizskiy bulge and so on.

The question of the age of the Tekturmas ultra-basite complex is rather obscure. In the opinion of some investigators the ultrabasites break through the beds of both the Lower and the Upper Silurian in district of the Boshchekul'skiy bulge. In many instances they form inter-formational intrusive bodies, lying between these two series. Workers from the Academy of Sciences USSR, on the basis of their studies of ultrabasite rocks in the Tekturmas mountains and adjacent regions, came to the conclusion that this complex is of pre-Upper Silurian age. It appears that the complex is here composed of gabbro, gabbro-diabases, peridotites and plagiogranites, of which the latter are the most ancient. Normally the plagiogranites in ultra-basite complexes are one of the most youthful members of the complex and in any event they are younger than the ultrabasites. The unusual consecutiveness of the rocks in the Tekturmas mountains leads to the suggestion that there is not one but two different types of complex of different age here: the more ancient one (Taconian) represented by the babbro and plagiogranites (i.e. analogous to the Kruk-Kudukskiy complex), and a younger one (Neo-Caledonian) which is the ultrabasite complex. In this event the presence of shingle in the gabbro in the basal conglomerate of the Upper Silurian cannot indicate the Taconian age of the ultrabasite complex. If in fact the Taconian age of the ultrabasites in the Tekturmas mountains can be confirmed, it will be necessary to divide the ultra-basites of Tsentral'nyy Kazakhstan into two complexes formed at different times but petrologically identical: the Taconian (Tekturmas mountains) and the Neo-Caledonian (Boshchekul'skiy bulge). The ultrabasites in the remaining regions would belong to either one or the other development.

5. The Borovskiy igneous complex was identified by the authors in northern Kazakhstan in 1950. It is well developed here both in the district of the Kokchetavskiy anticline and in the more ancient metamorphosed series and also farther east in the zone of Taconian folding. In this region the following are related to it: the large Zerendinskiy intrusive body (along the periphery of which there are, in the southwestern part, small intrusive bodies of Variscian age), those intrusive bodies studied by the authors and known as Borovskiy, Dzhukeyskiy, Makinskiy, Danilovskiy, the small intrusive bodies along the periphery of the Kryk-Kudukskiy intrusive body, those studied by P.N. Kropotkin and A.V. Glazkovskaya and known as the Seletinskiy intrusive body and some others. The age of the complex has been fairly

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accurately determined to be Neo-Caledonian judging from the way it has fractured and metamorphosed rocks of the Upper Silurian series, and the way it has overlain the Middle Devonian conglomerates.

The complex is composed only of granitoids of fairly diverse composition. The most diverse are the granodiorites. The varigated granites are fairly widely represented (biotitic-amphibolic, biotitic, leucocratic and aplitic), microgranites, aplites and pegmatites. An extremely characteristic feature is the widespread development of leucocratic granites of various colouration (red, rosy, white, yellowish) and of the most diversed structures (medium-grained, porphyrous, porphyritic, aplitic). The chronological consanguinity of the rocks is from the more basic to the more acidic. Petrochemically the rocks do not have any differ from the normal granodiorites and granites, but differing abruptly at the same time from the compositionally similar rocks of the Kryk-Kudukskiy igneous complex by normal, fairly high content of potassium and potassic feld spar. Of mineralogical interest is the presence of orthite, particularly among the biotiticamphiboles.

A characteristic pretrological feature of the complex is the frequent very regular circular or oval shape of the intrusive bodies and the circular or cone-shaped distribution in them of rocks of various composition. Frequently the leucocratic boundaries formed somewhat later as circular or cone shaped boundary intrusive bodies around the earlier intrusive bodies of normal granites. The intrusive bodies on the whole are generally pipe shaped.

The aplite dikes are exceptionally plentiful and remarkably varied in shape. In addition to the common steeply sloping dikes, aplites frequently form sloping and horizontal lamillar dikes, patelloids, as well as pipes, which are sometimes associated with the whole system of radial dikes, nodes etc.

Signs of cataclasm are observed only along the narrow localized zones, reaching sometimes for considerable lengths and to significant depth (up to 4 kilometers in the Dzhukeyskiy intrusion), and in the confines of some rocks that are strongly mylonized. It is quite probable that these showings do not represent a characteristic feature of the complex and are associated, not with intrusive bodies themselves, but with the framework of surrounding rocks.

Judging from the petrographic association of the rocks, shown only in the very ordinary granites, and in association with Neo-Caledonian folding, which was for the Caledonian tectono-magmatic cycle the main

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period of orogenesis, the Borovskiy igneous complex must without doubt be related to the granitoidal igneous formation. Rather uncharacteristic of the latter are the nearly tubular shapes of the intrusive bodies and their circular formation, which is generally more common to orogenetic intrusions than to batholiths. It is possible that the foregoing is not more than a unique tectonic condition studied by the authors in that part of the Severnyy Kazakhstan, i.e. the proximity of the rigid Pre-Cambrian foundation and the comparatively shallow covering of Lower Paleozoic sediments.

In other parts of Tsentral'nyy Kazakhstan the Borovskiy igneous complex can be associated with the intrusions of typical granitoids of Neo-Caledonian age. The mainly include the granites, granophres and granite-porphyries of the Sarysu-Tenizskiy watershed, which was identified by P.L. Merkulov as part of the second phase of the Caledonian intrusions. In the area of the Chu-Balkhash-Illiyskiy watershed this complex is expressed in many intrusive bodies of great size, represented by both granodiorites and by more acidic varieties of granitoids, right down to leucocratic and muscovite granites deprived of chromatic components. Apparently, this should also include the muscovite and tourmaline granites found in the Bet-Pak-Dela, consisting of quartz, orthoclase, microcline, microcline-perthite, albite, muscovite, biotite, tourmaline and iron oxides.

Outside the southwestern Caledonian folded margin the granitoids of the Borovskiy igneous complex are apparently fairly widely distributed but they form bodies of considerably lesser size than in the Caledonian margin district. These could include, for example, many of the granitoid bodies studied and described in the works of the Academy of Sciences USSR along the southern and western edge of the Karagandinskiy basin (Verkhne-Sarysuyskiy district of uplifting of the Caledonian foundation), rupturing the sediments of the Upper Silurian and Lower Carboniferous. However, these intrusions are very incorrectly considered to be Variscian. Granites of Caledonian age are also known for the Degelen-Chingizskiy and Karkaralinskiy regions in the northern Pribalkhash'ye and other places.

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6. The Stepnyaksiy igneous complex was studied by the authors in 1940 in the Stepnyakskiy gold district. The most characteristic and widely distributed rocks in the complex are the amphibolic quartzitic diorites, with a tendency towards gabbro-diorites and amphibolic gabbros. Granodiorites and granites also show secondary development in some of the intrusive bodies. The most stable mineralogical feature of the rocks of this complex is the presence in them of a light-brown common amphibole which in both the granulous and the porphyritic rocks forms clearly idiomorphic, greatly elongated crystals of frequently simple but sometimes polysynthetic twins. Spotted or zonal distribution of brown or greenish coloration is frequently observed. Similar amphibole is sometimes the only chromatic mineral in rocks corresponding to melanocratic gabbro and up through very leucocratic rocks.

The rocks of the Stepnyaskskiy complex form stocks of very small size which are irregular in form but very nearly oval. Most frequently the diamter of the stocks varies between 0.5. to 2 kilometers and only occasionally reaches 5 kilometers. The distribution of flow lines and the depth to which some have been worked (over 400 meters) show that these stocks are tubular bodies which do not expend to any extent with depth. Similar stocks are developed in the sectors occupied by the mines Stepnyak, Stalinskiy, and Dzhelambet and in some parts of the periphery of the Kryk-Kudukskiy intrusive body and in other places,

A characteristic feature of the complex is the extraordinarily broad development of dikes. Some of them are formed of the same amphibolic quartzitic diorites as the stocks, and sometimes they have contact cooling of the diorite-porphyritic or lampophoric appearance. Considerably more widely distributed are the amphibolic diorite-porphyrites with shot of the same brown amphiboles as is found in the diorites. With reduced quantity of amphiboles we observe a gradual transition to amphibolic and biotitic porphyries towards quartzitic porphyries and some of which are strongly albitized. On the other hand, with increasing quantity of amphibole we observe a gradual transition to broad development of lampopheres of a spessartitic appearance. Aplitic dikes are not numerous and in their distribution they are closely associated with dioritic stocks.

It is very characteristic that the quartzitic porphyries and lampopheres form dikes of approximately the same extent, in the majority of of cases latitudinally or nearly so. Sometimes lampopheres and quartzitic porphyries participate in the formation of one and the same suite of closely packed dikes. The diorite-porphyrites form independent suites of dikes, sometimes situated into mutually perpendicular directions, north-eastwards and northwestwards, wherein the dikes with the northwesterly strike in most cases are younger than the dikes running in ortheasterly direction.

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It is considered that the suites of dikes developed in the central part of Kryk-Kudukskiy igneous body relate to the Kryk-Kudukskiy body and not to the Stepnyak complex on the basis of the presence of cataclasm in the rocks of the dikes and the absence of Stepnyak complex rocks in that vicinity. The authors could not agree with this for the following reasons:

1. The degree of cataclasm in the rocks of the dikes is very small and differ sharply from the very strong cataclasm in the rocks of the Kryk-Kudukskiy complex.

2. The dike rocks petrographically sharply differ from the rocks of the Kryk-Kudukskiy complex and provide fully continuous transitions to the typical rocks of the Stepnyakskiy complex.

3. Perfectly identical suites of dikes are present in other intrusions of a more youthful Borovskiy complex. (for example in the Danilovskiy intrusion), where they are found clearly locally and in genetic association with stocks of the typical Stepnyak diorites.

4. The positioning of the suites of dikes is completely the same in the Kryk/kudukskiy and Borovskiy igneous complexes and does not depend on the internal tectonics of either intrusive body.

These considerations led the authors to categorically associate the above described dikes with the Stepnyak igneous complex. In some of the rock stocks of the Stepnyak complex secondary penetration by sequential flows of magma took place repeatedly along the same exit channel. In these cases we observe intensive brecciation of the earlier magmatic rocks and frequently also of the intruding rocks and sometimes formation of actual eruptive breccia. Naturally at the same time the conditions are favorable for contamination of the later flows of magma by foreign material and for the formation of hybrid rocks which are frequently observed in similar stocks. Interestingly enough, some lampophyritic dikes also have brecciation, which is of a taxitic texture, and eveloped as a result of a two-stage penetraion by lampophyric magma along the same fissure. In the process angular or rounded and frequently re-absorbed fragments of an earlier lampophere are cemented by the later lampophyric magma flows which are similar in composition.

In age, the Stepnyakskiy complex is much younger thant the Kryk-Kudukskiy and the Borovskiy. As we have already mentioned, some of the igneous rocks of the Borovskiy complex have dikes that are very typical amphibole quartzitic diorites. Of the Stepnyakskiy complex as well as

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lampopheres and quartzitic porphyries cutting across all the rocks of the Borovskiy complex right through the most leucocratic. The Danilovskiy intrusive body of the Borovskiy complex has a stock of typical amphibole quartzitic diorites of the Stepnyakskiy complex in close association with the dikes. In the northern part of the Kryk-Kudukskiy igneous body a stock of characteristically amphibolic quartzitic diorite of the Stepnyakskiy complex given an adruptly cool lampophyritic contact with the intrusive biotitic granites of the Borovskiy complex. The gold metallization of northern Kazakhstan (Stepnyakskiy auriferous region) is associated with the intrusions of the Stepnyakskiy complex.

Without doubt the Stepnyak complex includes fairly numerous small stocks of diorites in the Boshchekul'-skiy bulge. In this locality they are entirely contemporary with the diorite stocks of the Stepnyakskiy region, and are sometimes associated with poor auriferous deposits (May-Uzek). There is basis on which to relate the Stepnyakskiy igneous complex with the small intrusive bodies of quartzitic diorites and diorite-porphyries that were developed along the southern and western margins of the Karagandinskiy downwarping and have been studied here by workers from the Academy of Sciences USSR. Aong the western margin of the Karagandinskiy basin the quartzitic diorites and their associated diorite-porphyries break through the Upper Silurian series and the albitopheres of the Lower Devonian, but they are transgressively overlain by limestones of the Lower Tournaisian. Here they form clearly distinct extended patches, confined to the anticlinal combinations of the Upper Silurian sediments, and their areas seldom exceed 0.5 square kilometer. Quartzitic diorites and diorite-porphyries of the same type form the suites of meridional dikes in the Lower Devonian granitodiorites, which are considerably younger than the latitudinal dikes of aplitic leucocratic granites in the same granodiorites.

In the Sarysuyskiy region the quartzitic diorites and diorite are found in the form of small stocks in the Proterozoic series and they do not form independent large bodies. Small intrusions of Caledonian diorites are reported for the Degelen-Chingizskiy region. Finally, the presence of Caledonian rocks of the diorite type has also been detected in the area of the Chu-Balkhash-Iliyskiy watersheds. It is almost certain that a more detailed petrological study of the Tsentral'nyy Khazakhstan from the point of view of igneous complexes would make it possble to establish a considerably wider development of rocks of the Stepnyakskiy igneous complex, particularly in the zone of the Caledonian folded margin.

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7. The Atansorskiy igneous complex is the youngest of all the Caledonian igneous complexes. It was identified by the authors of this report in the northern Kazakhstan in 1940. This complex is associated with rocks of a somewhat higher alkalinity, expressed in the presence of syenite varieties and other rocks genetically associated with them. The rocks of the complex form a small stock between the Stepnyak and Stalinskiy mines on the shore of Lake Atansor. Here they form fairly unique quartzitic syenito-diorites, containing within the contact zones of the stock an enormous quantity of xenoliths of the intrusive rocks and in places graduate to typical eruptive breccia. In connection with the assimilation of these xenoliths the syenito-diorites show distinct signs of hydridization. Dikes of alaskite granite are found among the syenito-diorites. According to the data provided by P.G. Koreysho, farther north in this intrusive body the rocks convert to monzonites containing only 3% quartz, and even farther north the quartz completely disappears with the simultaneous appearance of monoclinic pyroxene.

Two small stocks of perfectly similar hybrid syenito-diorites were observed by the authors in the southern part of the Arkalykskiy intrusive body northwest of the Bes-Tyuba mine. A small body of aplitic granite is found here associated with these rocks.

In spite of the conjoint development with the clastic rocks of the Kryk-Kudukskiy complex within the confines of the Arkalyksiy intrusive body the syenito-diorites and aplitic granites of the Atansorskiy complex do not show signs of cataclasm, which indicates that they are younger rocks. In addition, we can observe the xenoliths in rocks of the Kryk-Kudukskiy complex in direct contact with the syenito-diorites of the Atansorskiy complex. The small territorial distribution of the Atansorskiy complex rocks did not permit us to establish the chronological relationship with the Borovskiy and Stepnyaskskiy complexes.

The geologists of the Kozzoloto Trust E.I. Rytsk and N.A. Fogel'man are incline to assign the Atansorskiy complex to the Borovskiy complex on the grounds that north of Atansor they observed transitions from leucocratic granite to characteristic syenito-diorites of the Atansorskiy complex. We consider this to be an obvious mistake, since these leucocratic granites are undoubtedly members of the same Atansorskiy complex as we shall see below, in the metallogeny of the Borovskiy and Atansorskiy igneous rock complexes does not permit us to resolve this problem.

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In other parts of Tsentral'nyy Kazakhstan we can relate the Atansorskiy complex with all the small bodies of syenites and similar rocks (granosyenites, syenito-diorites, monzonites and others) which are obviously of Caledonian age. It is quite probable that we may relate the small stock of syenite in the region of the auriferous deposit at Taukin with these rocks, as well as the igneous bed along the southeastern periphery of the Seletinskiy intrusive body which was described by P.N. Kropotkin and A.V. Glazkovskaya. We must also associate this complex with the small intrusive bodies of monzonites, syenites, granosyenites and syenite-porphyries in the vicinity of the Bayanaul'skiy and Chidertinskiy (Boshchekul'skiy bulge district) that were described by N. G. Kassin and others as being of Caledonian origin. The discovery of identical rocks in the shales of the Devonian conglomerates indicates that at least some of these rocks really are of Caledonian origin. In the Sarysu-Tenizskiy region P.L. Merkulov describe syenites which are apparently part of the second phase of Caledonian intrusion. In the Dzhezkazgan-Ulutauskiy region the Caledonian quartzitic syenites are very limited in their distribution and emerge in the form of small stocks mainly on the northern periphery of the Ulutauskiy mountains. A more extensive massif of quartzitic syenites is found in the Ak-Mola mountains on the left side of the Kara-Kingir river. In the western Pribalkhashye there is a more or less ancient small stock of syenite near Myn-Aral. Finally, in the Adir-Tau mountains (Chu-Balkhash-Iliyskiy watershed) there is what is considered to be a Caledonian monzonite consisting of andesine Nos 40-42, orthoclase rhombic proxene, biotite and amphibole. In all the remaining parts of the Tsentral'nyy Kazakhstan discoveries of syenites and similar rocks of Caledonian age have not been reported. Thus, the regularity in distribution of Atansorskiy igneous rocks is indicated: they developed mainly in the areas of the southwestern Caledonian folded margin, as well as within the confines of the Ulutauskiy anticline and the Boshchekul'skiy bulge, i.e. those regions where the Variscian age did not undergo considerable burial and as a result of which there are no large Variscian granitic bodies. Apparently, in all the remaining regions of new subsidence, associated with the beginning of the Variscian tectono-magmatic cycle, the Caledonian magmas were not permitted to continue to complete their evolution in the direction of increased alkalinity.

The described igneous complexes apparently include all the varied Caledonian intrusive rocks of Tsentral'nyy Kazakhstan. In any event, our modern evidence of the petrology of the Tsentral'nyy Kazakhstan does not permit us to identify any other Caledonian igneous complexes. It is quite likely that insofar as the extent and depth of our knowledge will permit, the identification of any new complexes, or those complexes already identified

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by us will prove to be petrologically so varied in the different sectors of their development that it will become convenient to divide some of them into two or more smaller igneous complexes according to their territorial characteristics. Thus, we have identified the following igneous complexes of the Caledonian tectono-magmatic cycle:

1. Anderkenynskiy igneous complex. Chu-Balkhash-Iliyskiy mountains. Age Salairian. Norite-trondhjemite igneous formation.

2. Dzhusalinskiy igneous complex. Stepnyakskiy region and probably, many other sectors of Tsentral'nyy Kazakhstan. Age Caradocian. Spilitic magmatic formation.

3. Kryk-Kudukskiy igneous complex. Mainly in the area of the southwestern Caledonian folded margin, and to a lesser extent, in other parts of Tsentral'nyy Kazakhstan. Taconian age. Norite-trondhjemite igneous formation.

4. Tekturmasskiy igneous complex. All parts of the uplifting of the Caledonian foundation in the confines of Tsentral'nyy Kazakhstan. Neo-C aledonian (Ardennes) age. Ultrabasitic igneous formation.

5. Borovskiy igneous complex. Mainly in the area of the south-western Caledonian folded margin, to a lesser extent in other sectors of Tsentral'nyy Kazakhstan. Neo-Caledonian (Erian) age. Granitoidal igneous formation.

6. Stepnyakskiy igneous complex. The Stepnyakskoye uplifting on the Caledonian folded margin, to a lesser extent in other parts of Tsentral'nyy Kazakhstan. Lower Devonian age. Post-orogenetic dioritic igneous formation.

7. Atansorskiy igneous complex. Southwestern Caledonian folded margin, Ulutauskiy anticline, Boshchekul'skoye bulge. Lower or Middle Devonian age. Monzonitic (incompletely developed) igneous formation.

Howerver, superficial our knowledge of the petrology of Kazakhstan may be it has shown that the enumerated igneous complexes are regularly disposed both chronologically and spatially. These very regularities, noted by us in Tsentral'nyy Kazakhstan and other tectonic districts of the Soviet Union, formed the basis for our impressions concerning the magmatic cycle described in the first part of this work (see "General Problems on the Metallogeny of Gold", Vol. II.). As you shall see farther on, these are the same regularities which apply to the chronological and spatial disposition of the Variscian igneous complexes of Tsentral'nyy Kazakhstan which we will now discuss.

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8. Ust-kamennogorskiy igneous complex is identified conditionally. In this complex we include the small, hypabyssal in character igneous bodies of basic and sometimes ultra-basic rocks that are found in some parts of the Rudnyy Altai and the western Kalba and on the basis of their strongly hydrothermal and dislocated metamorphism are normally considered to be Pre-Variscian. Judging from their descriptions, these rocks are most similar to the igneous representatives of the spilitic magmatic formations (analogical to the Caledonian Dzhusalinskiy igneous complex). However, since the latter is very poorly represented in the Lower Paleozoic of the Rudnyy Altai and Kalba and very fully developed in the Devonian Age, we consider it probable that these rocks are not of Lower Paleozoic age but of Devonian. It is all the more likely that the clearly Devonian effusive series of the region contain cupola-shaped bodies of keratophyres that are considered as sub-volcanic igneous bodies which are genetically closely associated with the Devonian effusions. These keratophyres must be related to that same igneous complex. The strongly dislocated metamorphism of the basic rocks during similar contracts clearly shows their participation in all the processes of Variscian folding. These rocks usually occur as small stocks that are frequently elongated in a northwesterly direction. The slaty varieties of basic rocks submitted to contact metamorphism and were converted into diopsid-plagioclastic hornfels under the influence of igneous plagiogranites of the Zmeinogorskiy igneous complex, which is an indication of their greater age. In the majority of cases the basic rocks are represented by gabbro-diabases, normally amphibolized, uralitized, chloritized, to a lesser degree epidotized and weakly albitized rocks. Field observations establish the igneous character of these rocks beyond question. The gabbro-diabases converted to porphyries in the zones of contact with rocks of the metamorphic series. Parts of the gabbro-diabases that underwent dislocation metamorphism were converted to amphibolites.

The ultra-basic rocks are normally more greatly transformed in comparison with the basic rocks, and are represented by peridotites, pyroxenites and olivinites. In occurrence they are irregular shaped sectors among the gabbro-diabases. The extent of such sectors is considerably less in comparison with the sectors of basic rocks and is measured in square meters, and very rarely in square kilometers. The rocks were intensively metamorphosed with conversion of olivine into serpentine, tremolite or talc, pyroxene and chlorite. Genetically the ultra-basic rocks are closely associated with the gabbro-diabases among which they are found.

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The cupola-shaped bodies (laccoliths) of ceratophyres measuring several kilometers in diameter were reported in the Rudnyy Altai among the Devonian effusions in the enrivions of the Chesnokova mountains, 3 kilometers South of the settlement of Klyuchi.

We shall emphasize once more that the relationship of the described gabbro-diabases rocks with their ultra-basic facies to the Variscian tectono-magmatic cycle and to the spilitic magmatic formation, although it may appear very likely nevertheless is still of a conditional nature.

9. The Charskiy igneous complex unites the ultrabasite intrusive godies of conditionally Variscian age of the western and southwestern parts of Kalba. Some authors state that the age of the series intruded by the ultrabasites is not clear, others state convincingly that these rocks broke through sediments of Devonian and Lower Carboniferous age. According to the geological map of the Soviet Union drawn to a scale of 1: 2,500,0000 the Kalba ultrabasites break through Devonian series.

The rocks of this complex are mainly ultra-basites converted, to a considerable extent, by the processes of auto-metamorphism into serpentines. The latter are composed of pseudomorphic loop-shaped antigorites from olivine and bastites pseudomorphosed from rhombic pyroxene. Intact olivine is very rarely observed. The serpentinites developed mainly from hartzburgites. Very much less frequently we encounter wehrlites and lherzolites which are normally much less altered. A much smaller role is played in the composition of the intrusions into the ultrabasites by the pyroxenetes containing intact monclinic pyroxene and the conversion of rhombic pyroxene into bastite. In some places the ultrabasites underwent intensive carbonization and enrichment of their magnesite which sometimes composes 64% of the initial weight of the rock.

Occasionally we find gabbro which is normally strongly emphibolzed, uralitized, saurruritized, sericitized, and scapolitized. Gabbro-diabases are more widely distributed.

10. The Zmeinogorskiy igneous complex was identified and described for the Rudnyy Altai by N.A. Eliseev, who established three age groups of rocks in its composition:

I. Olivine gabbro-norites, gabbro-norites and quartzitic gabbro-norites.

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II. Granodiorites and tonalites with subsidiary quartzitic diorites and diorites.

III. Adamellites and plagioclastic granites with subsidiary trondhjemites and normal granites.

N.A. Eliseev has included in this complex those granophyres, granite-porphyries and quartzitic albite-porphyries, which in this case, since they are found in vein form, make up the marginal facies of the igneous massifs, genetically associated with the rocks of the III group and younger rocks of the I and II groups. Among the rocks of each group we observe a close genetic association and a gradual transition from one rock type to another. Sectors composed of various groups of rocks differ sharply from one another, and the presence among them of igneous contact zones has undoubtedly a bearing on the differing ages of the groups, which follow in the sequence enumerated. The association of the Zmeinogorskiy igneous complex with the normal granites, and more so the granite-phorphyries, granophyres and quartzitic albite-porphyries appears to us to be more than doubtful. We must emphasize that N.A. Eliseev, in his description of the Zmeinogorskiy intrusive complex based his writings not so much on his own personal materials, as he did on the materials of a large group of young geologists working in consultation with him. It is commonly known how difficult it is in many instances to determine intrusive zones of contact in the field. It should be sufficient to mention that even such an exceptionally painstaking observer as L.V. Pirson, while working in an area of excellent exposure, overlooked the presence of an intrusive contact zone within the laccolith Sonkin-Sag, which even to the present time is used as an example in courses on petrology as a classical example of a laccolith, differentiated on the spot. It was not until forty years later during repeated investigations that these intrusive contact zones were determined. Whenever investigators, particularly beginners, and more so non specialists-petrologists are not able to determine the presence, in the field, of igneous contact zones for reasons of either poor exposure, or as the results of scanty information etc., or finally because the level of their observations and the care in which they did their work was, inadequate, they frequently arrived at completely inapplicable conclusions concerning the presence of "gradual transitions".

Incidently, the presence of gradual transitions between the various intrusive rocks ought to be documented much more carefully than the presence of igneous contact zones, since the latter are much easier to prove. This applies in particular when intrusive rocks differ noticeably among themselves in composition, structure and degree of breaking down and other features. When the gradual transitions between similar rocks have not been properly documented and proven, we consider ourselves entitled to doubt these transitions. This is exactly the case with the Zmeinogorskiy igneous complex.

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In Eliseev's works we find confirmation only of the presence of gradual transitions between adamellites and plagioclastic granites, on the one hand, and normal granites, granophyres granite-porphyries and quartzitic albite-porphyries on the other hand. The presence of gradual transitions between these rocks is not to be seen on the geological maps inserted in the works. The description of the rocks does not give proof of the manner in which the transition between fairly different rocks, on the one hand, in composition, and on the other hand in structure and how the transitional differences are characterized. In additon, the work contains repeated evidence that these rocks areof different chronological age (N.A. Eliseev, Petrography of the Rudnyy Altai and Kalba, pp. 83, 85 etc.). On pace 83 there is the following contradictory statement: "Normal granites either compose sectors of considerable size among the plagioclastic granites and there associated subsequent gradual transitons, or in relation to the plagioclastic granites they are interesting rocks. This situation can be observed, for example, to the southwest of Zmeinogorsk. Thus, on the left bank of the Berezovka river, within 3 kilometers of the trail, one can see grey fragmented plagioclastic granites and very new, without any traces of cataclasm, rosy normal granites. Direct contacts are not visible". From this it follows that the plagioclastic and normal granites are not only of different ages, but during the interval between their formation tectonic tension occurred has a result of which the plagioclastic granites were broken down. The dikes of granophyres, granite-porphyries, quartzitic albite-porphyries cut across the normal granites, i.e., they are later rocks. A number of workers have observed the intersection by the Altai type zones of folding, of not only rocks of the Zmeinogorskiy complex, but also of later biotitic granites (complex of micaceous granites noted by N.A. Eliseev), and they also found that in the zones of folding there were quartzitic albite-porphyries that were untouched by the folding (i.e., later rocks) and associated with them poly-metallic deposits which undoubtedly is proof of the considerably younger age of the dike rocks and their association with a completely different igneous complex.

Should it turn out that Eliseev's "Gradual transitions" between the adamellites and plagioclastic granites on the one hand, and normal granites, granophyres, granite-porphyries and quartzitic albite-porphyries on the other hand, does not exist in nature, then it would follow that entirely different conclusions would have to be drawn than those arrived at by Eliseev, namely, that there are in existence two groups of normal granites and dike rocks: one group, which is contemporary to the plagioclastic granites of the Zmeinogorskiy complex and is associated with them by continual spatial transitions, and the other group which is clearly much younger. We consider the existence of the second group to be indisputable,

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while the existence of the first group cannot be confirmed from the geological and petrographical data presented by Eliseev. It is very likely that an incorrect association of the dike rocks to the Zmeinogorskiy igneous complex, in addition to insufficient geological observations, was influenced considerably by an erroneous analogy between the presence in the plagioclastic granites of the Zmeinogorskiy complex of acidic plagioclase and the presence of metasomatic albite in quartzitic albite-porphyries.

On the basis of the foregoing considerations, the normal granites and dike rocks are considred by us to be independent of the Zmeinogorskiy complex and to be later formations, while the Zmeinogorskiy complex itself is deliniated in a much narrower extent than was done by Eliseev and excludes these rocks.

The Variscian Zmeinogorskiy igneous complex understood in this matter is petrographically and petrologically completely analogical to the above described Caledonian Kryk-Kudukskiy intrusive complex. As in the latter, the rocks of the Zmeinogorskiy complex are distinguished by a relatively high saturation of alumina. Correspondingly, the role played by plagioclase, rhombic pyroxene, biotite and quartz is greater; on the other hand, the role of potassic feld spar is very much lower. All the rocks of the complex are characterized by clearly expressed cataclasm.

The rocks of the complex form large batholitic bodies, at the apical parts of which the surface of contact with the lateral rocks is gently inclined away from the igneous body towards the lateral rocks. Intruded rocks are normally keratinized at the zones of contact, the width of the contact zone is not great and is measured normally in meters or tens of meters. Morphologically the rocks of the contact zones emerge on the surface as elevations, surrounding depressed areas formed by the intrusive bodies themselves.

The age of the Zmeinogorskiy intrusive complex is not clear. It is known that the intrusive rocks of the complex broke through and metamorphosed the sediments of the Devonian and Lower Carboniferous Ages. The upper age boundary is not limited. Some geologists think the age of the complex is Permian, however these suggestions are based exclusively on hypothetical considerations and, from our point of view, result from a completely erroneous notion concerning the association of the complex with ore-bearing quartzitic albito-porphyries. We consider it most likely that the age of the Zmeinogorskiy complex is the same as that of the Saurskiy complex, which will be described below, i.e. it is Visean. This best agrees with the association of the complex to the norite-trondhjemite igneous formation.

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11. The Saurskiy igneous complex was identified under that name by V.P. Nekhoroshev. It includes the small intrusive diorites and the somewhat larger young granodiorites, which produced vein off-shoots of grano-diorites that in places contain enclosed angular xenoliths of diorite. Both of these intruded the Lower Carboniferous and older sediments, forming comparatively small in size (100 to 150 square kilometers) intrusive bodies which were confined mainly to the cores of the anticlines. The most characteristic and predominant rocks of the complex are granodiorites, in comparison with which the diorites play a secondary role. More basic and more acidic varieties of rocks are even lesser significance.

The most basic rocks in the complex are the gabbro-norites and gabbro-diabases, represented by dikes and small stocks within the dioritic masses. Somewhat different are the intrusions of syenito-diorites which possibly are a part of this complex. The granodiorites are represented by more basic amphiboles and more acidic biotitic amphibolic varieties. The marginal parts of the diorites and granodioritic masses are usually confined to dikes and stocks of the most acidic rocks in the complex, i.e., aplites. The dioritic masses occasionally contain dioritic pegmatites.

An outstanding feature of the Saurskiy igneous complex is the complete absence of acidic granitic pegmatites and quartzitic veins. The second oblique distinguishing feature is the absence of any noticeable mineralization in connection with this complex, except for an insignificant cupric metallization in the contact zones, which is of no practical importance. The age of the Saurskiy igneous complex is determined by the following observations. In the Ur-Saura, on an eroded surface of intrusive bodies of the complex, in a number of places there was detected much younger effusive-tufogenic series, among which frequently occur layers of conglomerate containing diorite pebbles, granodirites and their products, in connection with which at two points this type of conglomerate lies directly on an uneven eroded surface of granodiorites. Conglomerates like this are also found in the igneous rocks of the Kalbinskiy Khrebet where they overlie Lower Carboniferous sediments. In 1934, in the southern Altai and on the north shore of Lake Zaysan, there were identified similar conglomerates containing granodiorite pebble, granodiorite-porphyry, diorite and other products of granodioritic intrusions, lying on a barren Lower Carboniferous bed. In both instances the conglomerates are interlain with sandstones and slates, containing marine fauna (goniatites), the age of which according to L.S. Librovich is Upper Visean. Thus the age of the Saurskiy complex is sufficiently accurately fixed as Visean.

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Evidently, this complex includes many igneous bodies of Variscian diorites and granodiorites, which are developed in the Tarbagatay. Granodioritic intrusions of Visean age, establish only from the gravel in the Visean conglomerates, are reported for the Severnyy Pribalkhash'ye. Many dioritic bodies of the southern Altai, being more ancient than the biotitic granites are, very probably, related to the Saurskiy complex. It is quite probable that the rocks of this complex extend into other parts of Tsentral'nyy Kazakhstan, but in many instances it is very difficult to distinguish them from the rocks of the younger Bayanaul'skiy igneous complex due to the small amount of study done on the petrology of the Saurskiy igneous complex and the absence of Upper Visean sediments in most of the regions.

12. The Bayanaul'skiy igneous complex includes the batholithic intrusive bodies of Tsentral'nyy Kazakhstan, associated with the main phase of Variscian folding at the beginning of the Middle Carboniferous Period. The age distinction from the Saurskiy igneous complex is very well established by the fact that in the northeastern Pribalkhash'ye the batholithic intrusions of the Bayanaul'skiy complex broke through and metamorphosed the Lower Carboniferous series and the lowermost strata of the Middle Carboniferous. In come comparatively rare intrusive bodies of the earliest phase of intrusive activity we dioritic or granodioritic varieties which form the marginal fringes of the batholithic bodies, metamorphosed by later and more acidic varieties of granitoids, or which form, in the latter, very large detached masses measuring up to several hundred meters in diameter (Bayanaul'skiy intrusive body), as well as being metamorphosed by more acidic granitoids and their dissecting dikes. The penetration of these more basic varieties of granitoids into the upper most strata of the Fisean and the lowermost strata of the Middle Carboniferous (southeastern Pribalkhash'ye) does not permit them to be related to the Saurskiy igneous complex.

The most widely developed rocks of the complex are the various granites, mainly biotitic and leucocratic and, to a lesser degree, biotitic-amphibolic varieties lying in close proximity to the periphery of the intrusive body. Dike rocks are widely developed and are represented mainly by micro-granites, granite-porphyries, aplites, pegmatites, and lampophyres of the spessartite, malchite, vogesite and kersantite kinds. In some of the intrusive bodies it is possible to clearly trace the numerous phases of intrusive activity in the presence of the differences in variety of granite in the intrusive contact zones of dikes and the younger granites and the earlier ones and the xenoliths of earlier granites and their later varieties. The absence of quenched contact materials shows that during the time of the separation of phases the granitic intrusions were separated by small intervals. In other intrusive bodies we observed rather more basic marginal facies and changes to more acidic towards the center of the intrusive body. Vital importance is given to the processes of contamination of granites by material from the intruded rocks in the formation of some intrusive bodies, as for example, the Aksoranskiy.

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In chemical and mineralogical composition most of the rocks of the complex correspond to the most normal granites without any unique features whatsoever. The amount of potassic feld spar is always fairly great, and in the leucocratic granites it is noticeably predominant over the acidic plagioclase. Some of the varieties of granites show widespread albitization both of the plagioclases and of the potassic feld spar. Moscovite is sometimes present in secondary quantities. Accessories are represented by titanite, apatite, magnetite, and occasionally ortite and fluorite are found. The aplites and micro-granites have a considerable amount of granite. Slight development of pegmatites is characteristic.

The intrusive bodies of the Bayanaul'skiy complex are typical batholiths and have dimensions from a few hundred to many thousands of square kilometers. If we consider that due to the irregularity of the cover and the shallow depths of erosion many of the batholiths appear on the surface at separate points, but have an underground connection, the area of whole, reconstructed batholiths must be measured in figures of the order 5 to 20 thousand square kilometers. Most of the batholiths are extended more or less in conformity with the strike of the intruded series. They include horizontal plutonic formations which used comparatively gently sloping surfaces for their intursions and in some cases they may have utilized the surfaces of upthrusts, and there are also vertical plutonic bodies confined to the cores of the anticlines and the zones of maximum upheaval. In relation to the large upliftings of the Caledonian foundation the batholiths of the Bayanaul'skiy complex are situated mainly on the slopes, at the boundaries with the adjacent synclinal downwarpings rather than in the central sectors. Excellent examples of this are the Boshchekul'skoye and the Verkhne-Sarysuyskoye bulges, in the central parts of which the Variscian batholiths are completely absent.

The area of occurrence of batholiths belonging to Bayanaul'skiy igneous complex is fairly clearly delineated. It takes in all the sectors of Central Kazakhstan, where there has been intensive activity by Variscian, Middle Carboniferous folding, i.e. all the southeastern part of Tsentral'nyy Kazakhstan, and is practically absent from its northwestern part. The boundary of the batholithic district of the Bayanaul'skiy complex passes along the southern edge of the Boshchekul'skiy bulge, encloses the southern edge of the Karagandinskiy downwarping, follows along an irregular inlet fairly deep to the West, in the district of the Dzhezkazgan-Sarysuyskiy region, and then makes a sharp turn to the southeast passing along the northeastern boundary of the Chu-Balkhash-Iliyskiy mountains. To the northwest, West and southwest of this boundary lie mainly Caledonian granitoids, among which a secondary role is played by small in area Variscian granitoids of Permian age, which developed in association with the subsidence of the northwestern part of Tsentral'nyy Kazakhstan during the Upper Paleozoic Age.

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13. The Kalbinskiy igneous complex (or the micaceous granite complex of N.A. Eleesev) is mainly represented by biotitic granites, comparatively infrequently homogenous, normally porphyritic and very characteristically coarse (1.5-2.0 centimeters) porphyritic sections of rosy potassic feld spar. Less widely distributed are the aplitic granites, which represent a slightly later phase of intrusive activity, and with which a considerable part of the rare metal minerallization is associated. The most characteristic minerals in the rocks of the complex are microcline, quartz and biotites, a lesser role is played by acidic plagioclase (from N. 25 in the center to Nos. 5 to 12 on the margins), orthoclase, muscovite, tourmaline and much less frequently amphibole are encountered. Micaceous and muscovitized granites are fairly common, they frequently contain tourmaline. The dike rocks are extraordinarily well developed and are represented by micaceous and muscovitized granites, pegmatites, which are very plentiful and characteristic of this complex, aplites, granite-poprhyries etc.. The dike rocks of this complex also contain syenite-porphyries, quartzitic diorite-porphyrites, and lampophyres, whose association with this complex is considered dubious by us, even though they do dissect the ore veins associated with this complex.

As in the Bayanaul'skiy complex, the intrusions of the Kalbinskiy complex form very large batholiths which are developed mainly in the areas of Kalba, Rudnyy, Gornyy and Southern Altai. The batholiths have very great dimentions, for example, the Pri-irtyshskiy batholith extends to 350 kilometers in length. They are of lesser size in the Tarbagatay (the Okpetinskiy batholiths). In these regions they are associated with deposits of wolfram, tin and molebdenum. In Tsentral'nyy Kazakhstan proper the intrusions of this complex are developed in a unique zone, which extends from the region of Kounrad to the North across the Karkaralinsk region where the northwest strike of the folding in this zone makes a sharp turn to the southwest and West of it. Within the boundaries of this zone the Kalbinskiy intrusions of the complex are associated with wolframic deposits at Koundradskoye, Akchatauskoye, Karkaralinsk and other places.

The age of the Kalbinskiy igneous complex is determined by the fact that its intrusions cut across the Lower Carboniferous strata and are younger than the intrusions of the Zmeinogorskiy and Bayanaul'skiy igneous complexes. Some geologists have expressed the opinion that the Kalbinskiy igneous complex is of Permian age (if we accept the Permian age of the Zmeinogorskiy igneous complex, which we have stated above to be in our opinion fundamentally wrong, then there is no other age but the Permian which could be assigned to the Kalbinskiy complex); however, these suggestions are considered by us to be very unlikely and unsubstantiated. Evidently, they

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they base their opinion only on the rupturing of Lower Permian sediments by granite-porphyries and the discordance of the quartzitic veins overlying the porphyries, the genetic association of these quartzitic veins with the Kalbinskiy intrusive complex appears to be very doubtful. It seems much more likely to us that the formation of the Kalbinskiy granites, which are typical representatives of sub-formations by pneumatolithic granites, is not separated by any significant interval of time from the formation of normal granitoids of the Bayanaul'skiy complex, as is frequently the case in all regions of their development. From this point of view it seems to us most likely that they are associated with one of the phases of Middle Carboniferous folding.

An apparent omission in the succession of igneous complex are the normal granitoids in the area of Kalba and Rudnyy Altai, where the Zmeinogorskiy igneous complex, which belongs to the norite-trondhejmite intrusive formation, follows the pneumatolithic granites of the Kalbinskiy complex. We consider this to be the result of insufficiently carefully performed field observations or incorrect division of the rocks into igneous complexes, during which the normal granitoids of the Rudnyy Altai and Kalba are erroneously assigned to either the Zmeinogorskiy or the Kalbinskiy complexes. It is quite likely that the normal granites, attributed by N.A. Eleesev to the Zmeinogorskiy intrusive complex, are actually one of the members of this omitted igneous complex. Depending on their petrology these intrusions can either be combined with Bayanaul'skiy igneous complex or else separated into an independent igneous complex.

14. The Maykainskiy igneous complex is the first in a series to be described from a number of igneous complexes which combine small intrusive bodies. The identification, determination of size, petrological characteristics and the determination of the age of all these igneous complexes is exceptionally difficutl, since the small intrusions making up these complexes are, without any justification, considered to be the products of large batholithic bodies of granitoids, mechanically attributing the petrological and metallogenic features and age of the batholiths to the small intrusions and the converse. All this has caused great confusion in the petrology of not only Tsentral'nyy Kazakhstan, but of all the other districts of the Soviet Union as well, and has extraordinarily complicated the identification and petrological description of the igneous complexes represented by these small intrusions. We have therefore reduced the following identification to four igneous complexes made up of small intrusive bodies: the Maykainskiy, Kounradskiy, the Altaiskiy and the Akdzhal'skiy, which appears to some extent to be reasonable and we base it on some of the petrographic and petrological features of the rocks, on the independent

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regions of their development, and mainly on the nature of their associated metallogeny, to which we attach vital importance. Insofar as the age of these complexes is concerned we cant state with certainty only that all four complexes are younger that the Bayanaul'skiy and Kalbinskiy complexes of granitoidal batholiths, but there is no data to show what is the upper limit of their ages and the chronological relationships of all four complexes amongst themselves. Judging from the nature of the associated metallogeny, we can suggest that the Maykainskiy, Kounradskiy and Altainskiy igneous complexes are approximately of the same age and are similar to one another in various tectonic sectors of Kazakhstan. The Akdzhal'skiy complex differs sharply from the, but it is very difficult to say whether it is younger or older. The dissection by Lower Permian granite-porphyry dikes and the inferred Upper Permian sediments described in the literature does not provide the key to the solution of this problem, since the granite-porphyries can be members of any complex of small intrusive bodies, and a free-hand chronological association of these granite-porphyries to one of the ore-bearing intrusive complexes can lead to undesirable errors. Therefore we must refrain from a more accurate determination of the age of the igneous complexes composed of small intrusive bodies described below.

The Maykainskiy igneous complex is taken to include all the small intrusions of Variscian age which form, in their composition, deviations in the direction of granosyenites, quartzitic syenites, syenites etc., i.e. they are of higher alkalinity. Naturally, this complex should include all the intrusive bodies which, in their composition, form deviations in the direction of syenites, but are genetically associated with syenitic intrusive bodies. The Variscian syenitic intrusions are particularly widely dispersed in the district of the Boshchekul'skiy bulge (Maykainskiy auriferous region), but they are also fairly common in all the other parts of Central Kazakhstan: in the Dzhezkazgan-Ulutauskiy region, in the northwestern and northeastern Pribalkhask'ye, in the Karkaralinsk and Degelen-Chingiz regions and in the Tarbagatay.

The composition of the rocks is extremely varied. Of the grainy rocks we here include the granosyenites and the closely associated genetically and spatially, fine grain alaskitic granites, quartzitic and non-quartzitic syenites of the alkaline and alkaline-earth varieties, biotitic amphibolic and, less frequently, pyroxenic rocks occasionally deprived of chromatic minerals. All these rocks are very well characterized by rosy and reddish colorations right through to brick-red and meat-red shades. Particularly wide development in the composition of the complex is enjoyed by a variety

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of porphyritic rocks: quartzitic and non-quartzitic syenite-porphyries, granosyenite-porphyries, granite-porphyries, and sometimes granodiorite-porphyries. The colors of these rocks are extremely varied and range from red and rosy tones to white, yellow and greys. In the rocks that are sufficiently rich in quartz the structure of the main mass is very characteristically micropoikilitic, micropegmatitic, psuedo-spherulitic and felsitic. On occasion we find, in conjoint development with rocks of the complex, lampophyries which must be related to this same complex. Pegmatites are completely absent from the composition of the complex.

Exceptionally characteristic of the rocks in this complex are the small forms of the intrusions: stocks in diameter from a few hundred meters to a few kilometers, dikes are found both as whole suites and singly, along with intrusive layers or sills. Very characteristic and widely distributed are the unique intrusive sills, localized along the zones of contact of the earlier batholithic intrusions and the intruded rocks (as has been described in "General Problems of Gold Metallogeny", Vol. II, such a distribution of intrusive bodies is gnerally characteristic of anorogenic small intrusions, syenites in particular). In many instance this has caused observers to consider such syenitic bodies as "marginal facies of granitic batholiths" and to even establish non-existent "gradual transitions" of them into granits. It is very characteristic that small intrusive bodies, particularly dikes, very frequently are found in completely independent developments, outside any visible spatial association with batholiths. The Boshchekul'skiy bulge is a very good example in this sense. Here the Variscian granitoidal batholiths, with the exception of the Bayanaul'skiy sector, are completely absent, but these dikes of syenites enjoy very wide devlopment.

In the Bayanaul'skiy intrusion the relationship between the Bayanaul'skiy and the Maykainskiy igneous complexes is very clearly established. The granosyenites and granosyenite-porphyries of the Maykainskiy complex, which form a margin along the southern edge of the Bayanaul'skiy intrusion, are clearly much younger than the medium grained alaskites of the Bayanaul'skiy complex. However, in its own turn, the very similar fine grained alaskites of the Maykainskiy complex are definitely younger than the granosyenites of that same complex. The presence of two generations of alaskites, separated by granosyenites, is proof that there are two different igneous complexes present here. The same picture was observed by Z.M. Usacheva in the Degelenskiy intrusive body.

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Some rocks in the complex, particularly the porphyritic rocks, probably in association with the peculiarities of their penetration, were accompanied by grinding of the intruded rocks and, because of their poor qualities of assimilation, this conditioned their hypabyssal character (which is particularly clearly shown in the porphyritic rocks), forming clearly evident hybrids, manifested as follows:

(a) In a clear lack of uniformity in the composition of rocks, particularly in the composition and quantity of phenocrystals;

(b) In the presence of relic fragments of rocks and minerals formed as a result of their inter-action with the porphyry magma;

(c) In the widespread development of titanite, apatite, ore and many chromatic minerals, confined to the slackened zones in the rocks;

(d) In the development of various structures of accretion both in the porphyritic and in the grainy rocks.

The rocks of the Maykainskiy igneous complex are associated with many of the copper and poly-metallic deposits in Tsentral'nyy Kazakhstan which are either confined to the contact zones of the igneous bodies themselves or more frequently are found in the sectors of their development.

15. The Kounradskiy igneous complex unites the small intrusive bodies of the northwestern, northern and northeastern Pribalkhash'ye composed mainly of grano-diorite-porphyries and granite-porphyries. These rocks either form independent stocks and dikes, or they are found in the form of intrusive beds adjacent to the contact zones on the peripheries of the earlier igneous granites and granodiorites. As is the case in the Maykainskiy complex, this leads to the erroneous conclusion that they belong to the marginal facies of the granitic and grano-dioritic igneous bodies.

When these rocks were being developed in the form of stocks and contact zone intrusive beds they were frequently widely associated with autometamorphic transformation both in the rocks themselves and in the rocks which they intruded, convertin themselves and the other rocks into so-called "secondary quartzite". The incorrect referral of these hypabyssal intrusive bodies to the complex of granites and granodiorites (Bayanul'skiy) results

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in the incorrect conclusion of the possibility of formation of secondary quartzite in association with large (batholithic) igneous granitoid bodies, with which we cannot agree. Batholiths of such granites and granodiorites enjoy very wide development in Tsentral'nyy Kazakhstan, but they are nowhere associated with the above mentioned formations of secondary quartzite, with the exception of those sectors where the development of unite hypabyssal granite-porphyry and granodiorite-porphyry rocks has occurred and has been identified by us in the independent Kounradskiy igneous complex.

Relating the igneous bodies of the Kounradskiy complex to the marginal facies of batholithic intrusions of granodiorites obstructs the discovery of regions where they are developed and of their petrological features. If we are to judge by the extent of distribution of the secondary quartzites, then the Kounradskiy igneous complex is manifested within the limits of the northwestern, northern and northeastern Pribalkhash'ye, in the Karkaralinsk and the Degelensk regions. Its identification as an independent igneous complex will permit the explanation of its petrological features and a more accurate determination of the region of its development.

16. The Altainskiy igneous complex was separated by us from the composition of the Zmeinogorskiy complex defined by N.A. Eliseev on the basis of data accumulated during the examination of the Zmeinogorskiy complex. The Altaiskiy complex includes those hypabyssal dike-like porphyritic rocks, such as granopheres, granite-porphyries and quartzitic albite-porphyries, with which the polymetallic mineralization of the Altai is associated. As was the case with the dikes in the preceding complexes, the rocks of the Altaiskiy complex forms besides the dikes, igneous beds in the contact zones with the batholithic masses of this Zmeinogorskiy complex, which was the cause for there being referred to the former. The quartzitic albite-porphyries, in addition, cut the Paleozoic beds as thick lamellar intrusive bodies and as stocks. The granopheres and the quartzitic albite-porphyries show a close association, which is manifested in their conjoint occurrence and the gradual transition from one to another. Very much less frequently we see such an association between the quartzitic albite-porphyries and the granite-porphyries. N.A. Eliseev describes gradual transitions from normal granites to granopheres and quartzitic albite-porphyries. If this were really true, then it would be necessary to include the normal granites, which were excluded by N.A. Eliseev in the Zmeinogorskiy complex, in the Altaiskiy complex of hypabyssal intrusive bodies.

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The rocks of the complex normally possess very distinct porphyritic structure and extremely diverse coloration, include white, rosy, yellow, grey, yellowish-grey, brownish-yellow etc.. Under the microscope the structure of the main mass of ricks is microgranitic, micropegmatitic, psuedo-spherulitic, felsitic and micropoikilitic, i.e., the same as in the porphyritic rocks of the Maykainskiy igneous complex. The granite-porphyries are shot through with plagioclase, potassic feld spar, less frequently quartz and even more rarely chromatic minerals such as biotite, amphibole or pyroxene occur. The basic mass consists mainly of albite-oligoclase, quartz, microcline, a very insignificant admixture of sphene, apatite, ore minerals, amphibole and biotite. The quartzitic albite-porphyries that underwent intensive hydrothermal automorphism, such as the plagioclases, as well as the potassic feld spar were replaced by albite, the chromatic minerals were replaced by chlorite, sericite, epidote and sometimes by biotite. In addition, during the process of hydrothermal transformation quartz was introduced into the rocks, which is indicated by the abnormally high silicic acid content in some analyses of quartzitic albite-porphyries (up to 85%0.

It is quite probable that the Altaiskiy igneous complex includes some other dike-like rocks, described by N.A. Eliseev, in the formation of the vein suite of the Zmeinogorskiy complex and the micaceous granitic complex. In this locality Eliseev comments on a great variety of rocks (diorite-porphyries, lampophyres, diabases, granite-porphyries, syenite-porphyries etc.). Undoubtedly the majority of them refer to the Akdzhal'skiy igneous complex which we describe below. It may turn out that some part of them does belong to the Altaiskiy complex, but it is impossible to distinguish them on the basis of only their petrographical descriptions.

17. The Akdzhal'skiy igneous complex, in our opinion, unites the so-called "small intrusive bodies of Kalba", which most of the investigators consider (and again in our opinion erroneously) as the product of the Pri-irtyshskiy granitic batholiths which relates to the Kalbinskiy igneous complex. There is literally no data to support such an association, apart from the geologists habit of necessarily associating small intrusive bodies with granitic batholiths. The small intrusive bodies of Kalba and those of the Altai are very different, and it is quite possible that they relate not to one, but to several intrusive complexes, which developed at different times. However, it is impossible to make such a distinction without field observations. We base our opinion concerning the association of the Akdzhal'skiy igneous complex, as was done in the previous cases, on the metallogenic feature, i.e. the association of the Akdzhal'skiy complex with the gold metallization of Kalba. In that event the Akdzhal'skiy complex includes a great quatity of

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stocks and dikes of fairly vaired rocks: diorites, quartzitic-diorites, diorite-porphyries, various lampophyres consisting mainly of amphibolic rocks, granite-porphyries and gabbro diabases etc.. It is very difficult to give these rocks any single petrographical characterization because of their great variety.

The dikes and stocks usually occur in conjoint development, but sometimes they are independent of one another. Different rocks of ioritic and granitic composition are frequently found within one and the same stock. The syenitic rocks normally form independent bodies, which arouses some suspicion of their belonging to this particular complex. Dikes of various composition frequently form whole suites which are not spatially associated with any other igneous bodies. Auriferous quartzitic veins are quite often localized within the confines of these suites.

The rocks of the complex (particularly the dike rocks) display strong autometasomatic transformations, such as: sericitization, chloritization and albitization. Traces of cataclasm are not observed.

Interesting chronological relationships have been established in the Kandygatayskiy region (western part of the Kalba). The wolframic quartzitic veins that are genetically associated with the Kandygatayskiy batholith of the Kalbinskiy igneous complex dissect the pegmatite dikes, but they in their own turn are dissected by dikes of granite-porphyries and quartzitic porphyry. To the southwest of Kandygatay we observe very extensive development of dikes of those same granite-porphyries and quartzitic porphyries and their accompanying intensively minerallized aurfierous quartzitic veins, which in this locality are younger than the dike rocks. By the same toke we established beyond doubt the more youthful age of the Akdzhal'skiy igneous complex relative to the Kalbinskiy complex and its associated wolframic minerallization. There is evidence that the granite-porphyry dikes cut across the Lower Permian sediments of the region as well and even across their unconformable, overlying porphyries, which have been conditionally assigned to the Upper Permian. Should it be possible to firmly establish that these granite-porphyries really do relate to the Akdzhal'skiy igneous complex, then this would permit the determination of its age as Permian and at the same time to fix the age of the auriferous metallization in the Kalba. However, until such an identification can be made, a more accurate determination of the age of the Akdzhal'skiy complex will not be attempted.

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18. The Ishimskiy igneous complex was identified and described by A.N. Zavaritzkiy in a group of interesting alkaline rocks, lying in a meander of the Ishim river, in the district of the Ishimskiy downwarp of the Kockchetav-Chuyskiy geoanticlinal zone. The Ishimskiy complex is distinguished by very high basicity right down to the development of the very characteristic psuedo-leucitic rocks. A.N. Zavaritzkiy distinguished two genetic groups of rocks: a) Volanic rocks and b) Nepheline syenites and their associated rocks. The first group includes the epileucitic porphyries (anchimetamorphic phonolites), accompanied by tuffs, trachytes and leucites (anchimetamorphic tephrites). The fully crystallized rocks are represented by nephelinitic syenites, differing in variety from white nepheline to congressites and monmouthites, liebeneritic syenites and shonkinites. A dike of fergusite-like rocks was observed.

In the southern part of the massif, along the Ashil-say there are developed rocks which A.N. Zavaritzkiy distinguished as monsomites, essexites and kentallenites. In association with them there are dikes of aplites that is composed of quartzitic-syenitic and granitic materials which cut across the basic rocks. This phase of igneous activity is associated by A.N. Zavaritskiy with dikes of plagioclastic-amphibolic rocks, which correspond in composition to the dioritic veins of rocks ranging from spessarites and bogezites through to dioritic poprhyries. These rocks do not show any traces of alkaline character. They dissect both the epileucite porphyries and the nepheline syenites, and, in their extent, they are apparently confined to the Ishimskiy complex as a whole. Variscian granites and grano-diroites emerging in the vicinity of the basic intrusive body are considered by E.D. Shlygin to have been broken through by alkaline rocks.

The successive stages of formation of the complex is outlined by A.N. Zavaritzkiy in the following form: formation of the complex began with extrusion of basic basaltic magma which was followed by a deeper flow of leucitic phonolites, accompanied by tuffs. Following the end of the folcanic stage the rocks were intruded by nephelinic syenites, which resulted in the formation of a group of unique contact rocks at the expense of the volcanic rocks. This was followed by the penetration of pyroxenic syenites, monsonites, essexites and kentallenites. The formation of the complex was terminated by the intrusion, on the one hand, by syenites and granitic aplites, and on the other hand by vein rocks of the dioritic or lampophyritic aspect. All the other known extrusions of typical basic rocks of Variscian Age should be related to the Ishimskiy complex on the basis of the great similarity of their petrographic composition. These

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include the nephelinic syenites of the Ulutauskiy mountains, the sodalite syenites of the Tolpak mountains in the district of the Boshchekul'skiy bulge, found and described by N.G. Kassin, the nephelitic syenites of the left bank of the Irtysh river between Semipalatinsk and Pavlodar, discovered by V.F. Bespalov, the shonkinite-porphyries of the Tarbagatay from the writings by M.M. Vasil'evskiy described by V.N. Lodochnikov under the name of orthoclastic gabbros. The exact position of all these basic rocks in the Variscian tectono-magmatic cycle has not been determined.

19. The Chakchanskiy igneous complex unites the intrusive bodies made up of typical alkaline granites developed in the confines of Tsentral'nyy Kazakhstan, i.e., the granites which contain basic chromatic components, pyroxenes or amphiboles (aegirine, riebeckite, arfvedsonite). Outcroppings of these rocks are known in three sectors. In the Maykain-Bayanaul'skiy region D.S. Korzhinskiy reports the discovery of alkaline arfvedsonite-anorthoclastic granites and granophyres in the region of the Chakchanskiy piquet and gives an analysis of those rocks. According to his geological map, these rocks form a stock about 11 kilometers in length and 4 kilometers in width, elongated in a northeasterly direction and covered over by Jurassic continental series in the North. In the region of Ayaguz, D.S. Korzhinskiy describes two small stocks of alkaline granites, consisting of microcline, a great quantity of quartz, riebeckite and a mineral from the astrophllite group. From a comparison of properties D.S. Korzhinskiy consideres that these intrusions are younger than the neutral granites of Variscian age. The occurrence of one of the intrusive bodies along the zone of contact of normal granites and its intruded rocks also favors this proposition. The intrusions of alkaline aegirine-riebeckitic pertitic granites and their corresponding granite-porphyries are reported for the extreme eastern part of the northeastern Pribalkhash'ye, in the mountains of the Dzhaksy-Kyuyken-Tay.

Basic granites are described by N.N. Gornostaev in the omposition of the Semeytauskiy magmatic complex, which is a very youthful, definitely Permian age. It is possible that the basic granites of the Chingizskiy igneous complex do relate to the Semeytauskiy complex, but there is not sufficient data concerning their age and we are going to identify them for the present as an independent complex.

20. The Chingizskiy igneous complex includes numerous dikes composed of diabases which are particularly widely distributed over the Chingiz Khrebet, but which are also found in other parts of Tsentral'ny Kazakhstan, in particular in the Ayaguzskiy region, in the Tarbagatay, in the Bayanaul and Tselinograd regions. The distinctive features of these

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diabases is their noticeable tendency towards alkalinity, which is expressed in the purely augitic (and not pigeonitic) character of the pyroxene. Some varieties of the pyroxene are represented by typical lilac-tinged, and sometimes intensively violet coloured titan-augite. It is difficult to say whether or not all of the late Variscian diabases are distinguished by a somewhat elevated alkalinity. We observe this only for those regions from which it was possible for us to personally examine thin sections from the collections of the VSEGEI. However, the diabases described by N.A. Eliseev for the Rudnyy Altai also frequently show the elevated alkalinity and the presence of lilac-tinged titan-augite. Characteristically, N.A. Eliseev comments on the close association of the diabases with the lampophyres, which are sometimes also clearly alkaline, since they contain barkevikitic amphibole, and cannot be defined as anyting but camptonites. Eliseev considers these alkaline diabases to be a vein suite of rocks of the Zmeinogorskiy igneous complex, with which we categorically cannot agree.

21. The Dzhungarskiy igneous complex is what we call the widespread rocks of this complex in the Dzhungarskiy Alatau, where their age is very accuratly established in accordance with their rupturing of the effusive-sedimentary series of the Permian Age. In this complex we include the red alaskitic granites of Permian age which occur in other parts of Tsentral'ny Kazakhstan as well. They are non the less best developed in those sectors where there had existed large synclinal downwarps, that are traced in the Upper Paleozoic from the Middle Paleozoic Age (Zaysansk syncline, northeastern Pribalkhash'ye), or where such downwarps have developed only in the Upper Paleozoic (Selety-Ulentinskiy downwarp, Dzhezkazganskaya trough, partially the Tenizskaya trough). These granites are characterized by an obvious alaskitic character, complete or almost complete absence of chromatic components, of which only a very small amount of biotite appears, there is a clear preponderance of potassic feld spar over plagioclase, and not infrequent presence of micropegmatitic structures, occasionally having a miarolitic composition. In shpae they rarely resemble real batholiths. Much more frequently their shapes are transitional from the typical batholiths to anorogenic intrusions. In accordance with this they frequently occur along the contact zones of a variety of suites, individual folded complexes etc., forming not only dissecting but, in many cases, concordant intrusive bodies. In the marginal parts there are characteristic transitions to granite-porphyries, granophyres and in some cases to syenites. A great deal of confusion was brought into the petrology of these complex by the geological works done in the Kalba and the Rudnyy Altai, where practically all the granitic intrusions have been erroneously assigned Permian age.

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All the most important minerals of the Dzhungarskiy Alatau and the copper metallization of the Dzhezkazgan are associated with the Dzhungarskiy igneous complex.

22. The Semeytauskiy igneous complex was identified and described by N.N. Gornostaev in the mountains of Semey-tau near Semipalatinsk. Later on that author gave this complex a much wider meaning, and extended it to practically all the Variscian intrusions of the Eurasian mainland. We cannot agree with such a view of the complex, and we have give it a much more restricted meaning. The complex includes trachydolerites, trachyandesites, pantellerites, comendites, gabbro-syenites, semeytavites (quartzitic anorthoclases) and alkaline granites. Gornostaev considers that initially the magma flowed over the surface, producing effusive beds, and later on its flow was crystallized in the beds of these effusions in the form of sub-volcanic intrusions. However, the complete absence of tuffs in the composition of the complex casts doubt on the correctness of such an approach. We cannot exclude the possibility that the rocks considered by Gornostaev to be effusive rocks, are in reality hypabyssal intrusions.

Increased alkalinity is found in all the rocks of the complex whether they be basic rocks or acidic. In the basic rocks it is expressed in the presence of potassic feld spar in the gabbros, as well as in titan-augite of a pyroxenic character. In the acidic rocks it appears as anorthoclase, aegirine, riebeckite and arfvedsonite. The complex was formed as a result of successive intrusions of various flows of magma. In form we have all transitional stages from mantles to streams (according to Gornostaev) and laccoliths. Dikes are rare and consist of comendites and sometimes porphyries.

This igneous complex should include the kentallenite intrusions of the northeastern Pribalkhash'ye, which are younger than the red alaskitic granites. They consist of unique gabbroidal rocks which are very suggestive of the gabbroids found in the Semey-Tau mountains and which consist of plagioclase, orthoclase, anorthoclase, augite, hypersthene, olivine, biotite and quartz that is present even in the olivine-bearing rocks. It is quite likely that these should include the individual dikes of kentallenitic dolerites that are found in the Tselinograd, Bayanaul and Chingiz regions which are characterized by a sharply elevated content of potassic feld spar with a high content of hypersthene and sometimes olivine.

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23. The Trachydroleritic igneous complex consist of lone dikes that are found regularly over a large part of the Tsentral'nyy Kazakhstan territory which consists of olivine dolerites and trachydolerites. Of two such dikes one was observed by the authors in the Arkalykskiy intrusion of the Stepnyakskiy region, the other in the vicinity of the deposit at Tort-kuduk, in the Boshchekul'skiy bulge district. Judging from the descriptions, this type includes the dikes of olivine trachybasalt, described by D.S. Korzhinskiy for the Bayanaul'skiy region, near the lake Ashchi-kul' (Kaydaul'skiy mountains). All these rocks are composed of labradorite, olivine an augite (but not pigeonite) pyroxene with our glass structure and sometimes clearly expressed lilac-tinged titan-augite. Similar dikes are reported by A.G. Gokoev for the Pricharskiy region of the western Kalba, by A.I. Egorov in the Teniz-Korzhunkul'ye region, by P.G. Koraysho along the Ishim riverin the Ruzaovka region. A.G. Gokoev considers all these dikes to belong to the Mesozoic magmatic cycle which is in full accord with our views.

Thus, we identify the following igneous complexes in the Variscian magmatic cycle)preserving the numbering system that is ued in the text):

8. Ust-Kamenogorskiy igneous complex. Rudnyy Altai and western kalba. Age Devonian. Spilitic magmatic formation.

9. Charskiy igneous complex. Western Kalba. Age early Variscian. Ultrabasitic igneous formation.

10. Zmeunogorskiy igneous complex. Rudnyy Altai. Age early Variscian. Norite-trondhjemitic igneous formation.

11. Saurskiy igneous complex. Saur, Tarbagatay, Altai, northern Pribalkhash'ye. Age Visean. Granitoidal igneous formation.

12. Bayanaul'skiy igneous complex. All the southeastern part of Tsentral'nyy Kazakhstan. Age Middle Carboniferous (Sudeten). Granitoidal igneous formation.

13. Kalbinskiy igneous complex. Kalba, Rudnyy, Gornyy and Yyzhnyy Altai, Tarbagatay, northwestern Pribalkhash' ye, Karkaralinsk region. Age Middle Carboniferous, probably Asturian. Granitoidal igneous formation, sub-formation of pneumatolithic granites.

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14. Maykainskiy igneous complex. Boshchekul'skoye buldge, Dzhezkazgan-Ulutauskiy region, northwestern and northeastern Pribalkhash'ye, Kararalinsk region, Degelen-Chingizskiy region, Tarbagatay. Age Upper Paleozoic, closer determination not possible. Monzonitic igneous formation.

15. Kounradskiy igneous complex. Northwestern, northern and northeastern Pribalkhash'ye, Karkaralinsk and Degelen regions. Age Upper Paleozoic, more accurate determination not possible. Igneous formation obscure.

16. Altaiskiy igneous complex. Rudnyy Altai. Age Upper Paleozoic, more accurate determination not possible. Igneous formation obscure.

17. Akdzhal'skiy igneous complex. Kalba, Yuzhnyy Altai, very likely Tarbagatay. Age Upper Paleozoic, more accurate determination not possible. Igneous formation post-orogenic, dioritic (?).

18. Ishimskiy igneous complex. Ulutauskiy mountains, Ishimskiy downwarp. Boshchekul'skoye buldge, Prisemipalatinskiy raion, Tarbagatay. Age Upper Paleozoic, not determined more accurately. Monzonitic igneous formation.

19. Chakchanskiy igneous complex. Boshchekul'skoye bulge, Ayaguzskiy region, northeastern Pribalkhash'ye. Age Upper Paleozoic, not determined further. Igneous formation obscure, but with elevated alkalinity.

20. Chingizskiy igneous complex. Chingiz Khrebet Rudnyy Altai, Tarbagatay, Ayaguzskiy, Bayanaul'skiy and Tselinograd'skiy regions. Age Upper Paleozoic, not determined more accurately. Essexitic igneous formation, not fully developed (slightly elevated alkalinity).

21. Dzhungarskiy igneous complex. Dzhungarskiy Alatau. Zaysansk syencline, Pribalkhash'ye, Selety-Ulentinskiy downwarp, Dzhezkazganskiy region. Age post Lower Permian. Intrusive formation is obscure possibly granitoidal.

22. Semeytauskiy igneous complex. Semipalatinsk region, Pribalkhask'ye, smaller than the Chingiz, Bayanaul and Tselinograd raions. Age Permian, kentallenitic igneous formation.

Standing completely aloof is:

23. Trachydoleritic igneous complex. Stepnyakskiy, Bayanaul'skiy, Ishimskiy, Eremen'tavskiy, and Pricharskiy regions. Age Mesozoic. Trachybasaltic magmatic formation.

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In comparison with the Caledonian magmatic cycle we see that the Variscian cycle is considerably more complicated. The initial stages of both cycles coincide almost completely in character of igneous complexes. However, after the granitoidal intrusions during the period of main orogenesis (Bayanaul'skiy igneous complex) the Variscian magmatic cycle became much more complicated and began to differ greatly from the Caledonian. The reason for this is that the Caledonian magmatic cycle remained as we have already observed, uncompleted and therefore the later and most varied and mineral rich intrusive complexes were not able to appear in it. Characteristically for the first half of the Variscian magmatic cycle age of the igneous complexes is determined fairly accurately. After the period of main orogenesis, in association with the prolonged cessation of sedimentation, the age of the igneous complex can be determined only ver approximately, with the exception of the very youngest rocks which appeared after the period of Upper Paleozoic sedimentation.

N.G. Kassin delineates eight magmatic cycles in all for the Tsentral'nyy Kazakhstan:

A.	Pre-Paleozoic.	I.	Granito-gneisses, strongly compressed microcline-pertitic granites, crumbled gabbro, crumbled aplite.
		II.	Plagiogranites, gabbro, diorites, granites, serpentines.
B.	Early Paleozoic	III.	diorites, syenites, granites, gabbro. All in the shale of the Upper Silurian. Cambrian-Lower Silurian.
		IV.	Peridotites, pyroxenites, granites, gabbro, diorites. Upper Silurian - Lower Devonian.
C.	Middle Paleozoic	V.	Granodiorites, granites, gabbro. Devonian - Middle Carboniferous.
		VI.	Granites, syenites, monzonites, mangerites, leucitic rocks. Upper Carboniferous - Lower Permian.
		VII.	Upper Permian - Lower Triassic.
D.	Mezozoic.	VIII.	Olivinic basalts. Jurassic.

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As you can see, the understanding of the term magmatic cycle is different for us and for N.G. Kassin. N.G. Kassin understands a magmatic cycle to be every specific period during which volcanic activity was manifested along with its subsequent intrusions. In this way the specific periods of intrusive activity are determined, not on the basis of any petrological data, but only on the possibility of establishing the age of the intrusion under the conditions of sedimentation and during the appropriate period of time. Therefore, N.G. Kassin combines various petrological, and, from our point of view, a variety of igneous complexes together during each period of igneous activity. Therefore our hypotheses and those of N.G. Kassin coincide only with difficulty and then in only the most general terms.

Having described in general terms the igneous complexes of Kazakhstan we shall now proceed to a discussion of its associated metallogeny.

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JIB(CAN) 26/66

DATE 19 October 1966

JOINT INTELLIGENCE BUREAU
Ottawa

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JIB/CAN 26/66

ITEMS OF ECONOMIC & TOPOGRAPHICAL INTELLIGENCE FROM CANADIAN SOURCES

September 1966

(UNEVALUATED INFORMATION)

JOINT INTELLIGENCE BUREAU
Department of National Defence
OTTAWA, CANADA

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ITEMS OF ECONOMIC & TOPOGRAPHICAL INTELLIGENCE FROM CANADIAN SOURCES.

September 1966

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The Director JIB(Ottawa) would be grateful for any suggestions or comments that the recipients of this Summary may care to make.

NOTE: High grade prints of photographs in this publication may be obtained, or negatives borrowed, from the Director JIB(Ottawa).

EVALUATION

A. Completely reliable	1. Confirmed from other sources.
B. Usually reliable	2. Probably true
C. Fairly reliable	3. Possibly true
D. Not usually reliable	4. Doubtful
E. Not reliable	5. Probably false
F. Reliability cannot be judged	6. Truth cannot be judged

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I. CHINA

TOPOGRAPHICAL INTELLIGENCE
Submarines :

1. Chinese submarines are reported to be replacing the Pakistan submarine PNS Ghazi in 1967. (See item #VII , page 12, this issue.)

Evaluation: C-6
Report & Date: 41/66 of 9 Sept 1966
Source: CFA/Pakistan

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II. CZECHOSLOVAKIA

TOPOGRAPHICAL INTELLIGENCE
Tour, 26 August 1966

1. The Canadian Military Attache accompanied the British Military and Air Attaches on a tour, 26 August, through PRAGUE-BENESOV-TABOR-TECHYNE-TYN nad VLTAVOU-CZEKE BUDEJOVICE-CESKY KRUMLOV-CERNA v POSUMAVA - VOLARY-VOLYNE STRAKONICE-DUBENEC-DOBRIS-ZBRASLOV-PRAGUE. A complete report has been made and circulated to interested persons (see British reports DA 2/262/ADN/43 of 15 Sept 66, DA 2/253/41 of 1 Sept 66, DA 2/261/ADN/42 of 12 Sept 66)

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III. CZECHOSLOVAKIA

SHIPPING - Electronic Report
Visit of REPUBLIKA, Montreal
August 1966

1. The Czechoslovakian mership REPUBLIKA was inspected in Montreal at the end of August 1966.

2. The vessel was built at Stettin, Poland and launched in 1964. Her port of Registry is Praha. Her callsign is OLGA, radio license T1-33/1964 dated 28 January 1964, and she carries one radio operator (Second Class) certificate.

3. She is very modern design and the following radio report will show that her radio equipment is of Polish, British and Danish manufacture.

TRANSMITTERS

MAKE	MODEL	FUNCTION	POWER
ELEKTROMEKANO A/S	S249E-M No. 4526	Main	405-537 KCS .25-.4
"	S249E-H No. 4526	Short Wave CW & RT	4-23 MCS .25-.6
"	S-249E-B No. 4526	MF RT	1605-3800 KCS .1
"	S-106H No. 4723	RESERVE	405-535 KCS .075
STORNO (MADE IN DENMARK)	CQF13-2 No. 11361	VHF RT	152-174 MCS .020
CMC (RENTED)	SER207 CN86	MF RT	1.6-9.0 KCS .060
STORNO	No. 1347 CB13-8	VHF REMOTE CTL	- -
ELEKTROMEKANO A/S	S249-E No. 4526	POWER SUPPLY	MAIN-SHORT-WAVE-MF RT.

RECEIVERS

MAKE	MODEL	FUNCTION	FREQUENCY RANGE
ELEKTROMEKANO A/S	M97 No. 4674	MAIN	14 KCS - 26.0 MCS (10 RANGES)
"	M88 No. 4805	2nd RCVR	75 KCS - 25.0 MCS (6 RANGES)
MORS	OA&151 NP	RESERVE	380-570 KCS.
ELEKTROMEKANO A/S	A7N NR. 1277	A.A.	500 KCS (PASS 491-509 KCS)
" "	E38N NR311	POWER UNIT FOR A.A.	- - -
STORNO	CQF 13-2 No. 11361	VHF RT	152-174 MCS
CMC (RENTED)	SER 207 CN86	MF RT	1.6 - 9.0 MCS

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(REPUBLIKA Electronic
report, August 1966)

TRANSMITTING FREQUENCIES

MAIN - A1-A2 - 410-425-448-454-468-480-500 and 512 KCS

MAIN - A1 - 4190-4181-4214-6285-6271-6321-8380-8362-8429-12570-12543-12643-16760-16724-16858-22282-22240-22345.

MAIN - A3 - 4085-4117-8217-8249-12354-12389-16519-16533-22?31-22059-KCS.

MAIN - A3 - 2049-2056-2182-2472-2638 KCS.

RESERVE - 410-425-448-454-468-480

RADAR

VHF - (report unreadable)

P/L - 500 and 8364- KCS

LIFEBOAT RADIO APPARATUS

MAKE	MODEL	FREQUENCIES	FUNCTION
ELEKTROMEKANO (SER. 2793)	SM108 KD 2.a	500 and 8364 KCS	
BZSO	28/1 SEREA 1963		BATTER CHARGER
ELEKTROMEKANO	PASA 910 80 ROX-62		ANT. SWITCH TX
BYDGOSKIE ZAKLADY SPRZERO OKRETOWEGO	RZ-009 NP 12 ROK 1963		ANT. SWITCH RX

ANTENNAE -
MF RT - INVERTED V 37FT HEIGHT
TX MAIN ANT. UMBRELLA (6VERTICAL WIRES-UMBRELLA- & WHIP ON TOP - OVERALL HEIGHT APPROX 65 FT)
TX RESERVE ANT. INVERTED L (FLAT TOP APPROX. 70 FT) 25 FT HEIGHT
RX " " " " (" " " 40 FT) 25 FT HEIGHT
CHARTROOM RX - VERTICAL 28 FT HEIGHT
DF SENSE ANT. - VERTICAL 28 FT HEIGHT
DF LOOP ANT. - 6 FT HEIGHT
RX MAIN ANT. - VERTICAL 28 FT HEIGHT
VHF ANT. (PIPE) " " " "

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(REPUBLIKA Electronic report, August 1966)

MAKE	MODEL	FUNCTION	FREQUENCY RANGE	POWER KW
KELVIN HUGHES	SER. 13089	RADAR	944.5 + 35 MCS	3
MORSKI RADAR NAWIGACYJNY ROK PROD. 1963 NR.5-1284 ZASILANIE 220V. COS φ 0.82 POBOR MOCY 1200 VA	RN-222	RADAR	9320 - 9500 MCS	40
SAME AS ABOVE	RN-222	RADAR	9320-9500 MCS	
ELEKTROMEKANO A/S	M88 NR.4804	CHARTROOM RX	75 KCS - 25 MCS (6 RANGES)	
"	P279G NR1598	D.F.	240-540 KCS 1600-3800 KCS	
KELVIN HUGHES	17 SER.13089	RADAR	9445 + 35 MCS.	
ZAKL WYTWORCZE URZADZ TELEF	KACM-20 T21A-6145-009-1/B H-71 1963	TELEPHONE SYSTEM		

One ground plane ant., located Port Side, Bridge DECK, 20 ft Height, + whip 7 ft. Overall height approx 27 ft.

Note: Unable to Locate Equipment.
S.R.T. CERT. ISSUED AT SZCZECINIE

DATED: April 16, 1966
VALID UNTIL: 31 March 1967

Date of Report: 19 September 1966
Source: DGI/INT S

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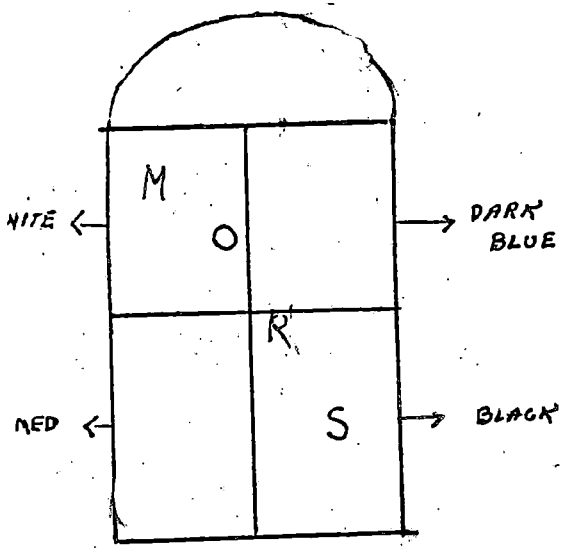
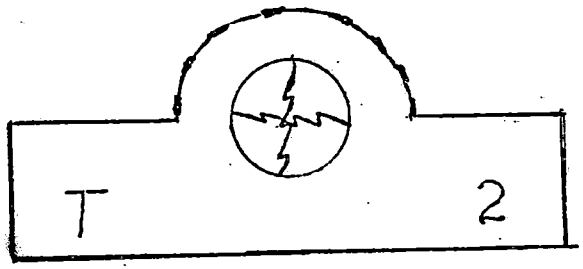
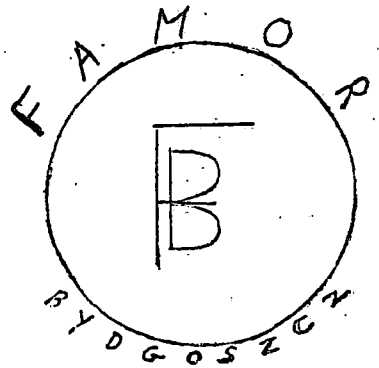


SEEN ON ENGCY RCVR.
MODEL OA-151

EQUIPT MADE IN POLAND



SEEN ON AMPLIFIER TELEPHONE (DIAL)



SEEN ANT. SWITCH R.X.

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RADIO ROOM

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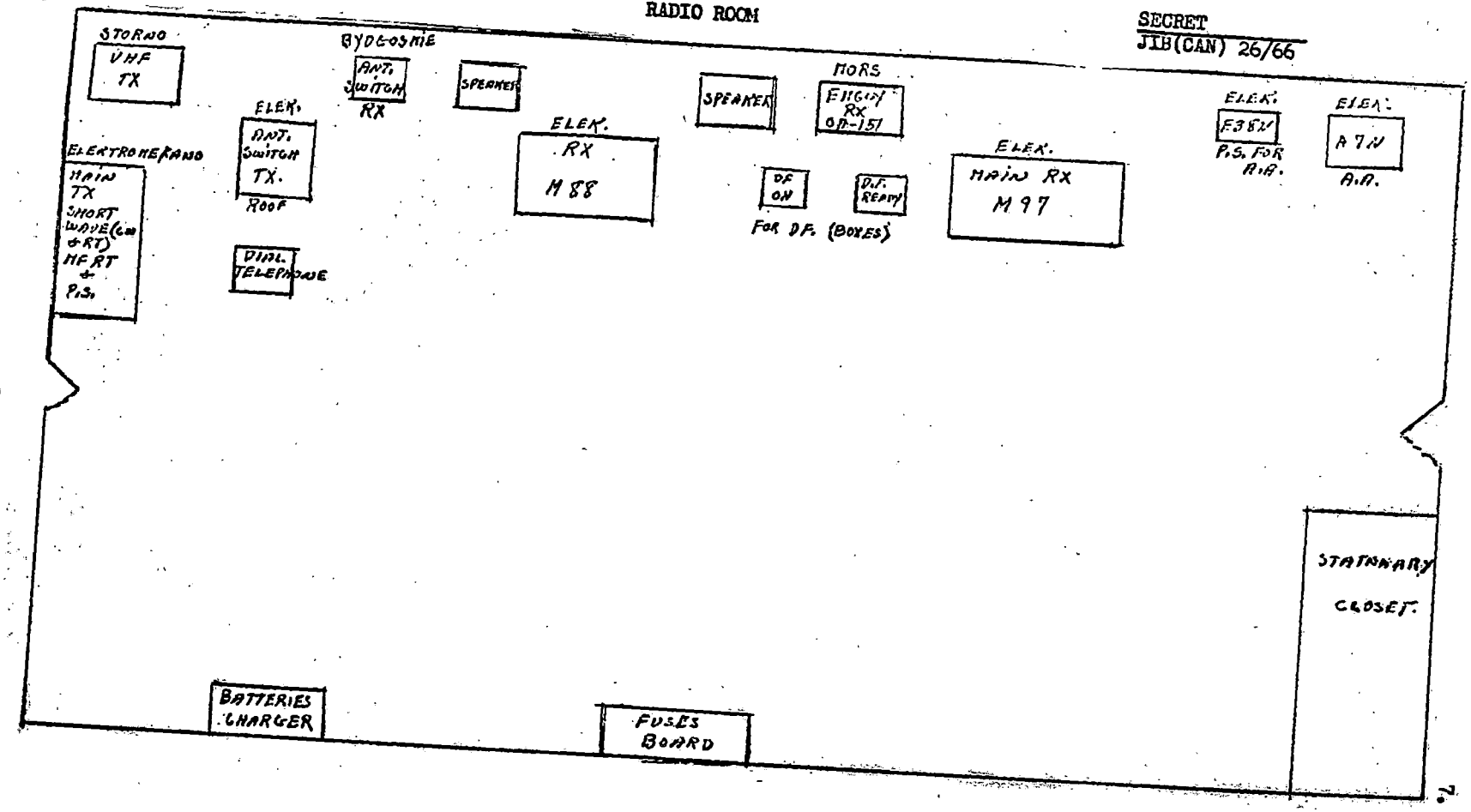

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APPENDIX "A"

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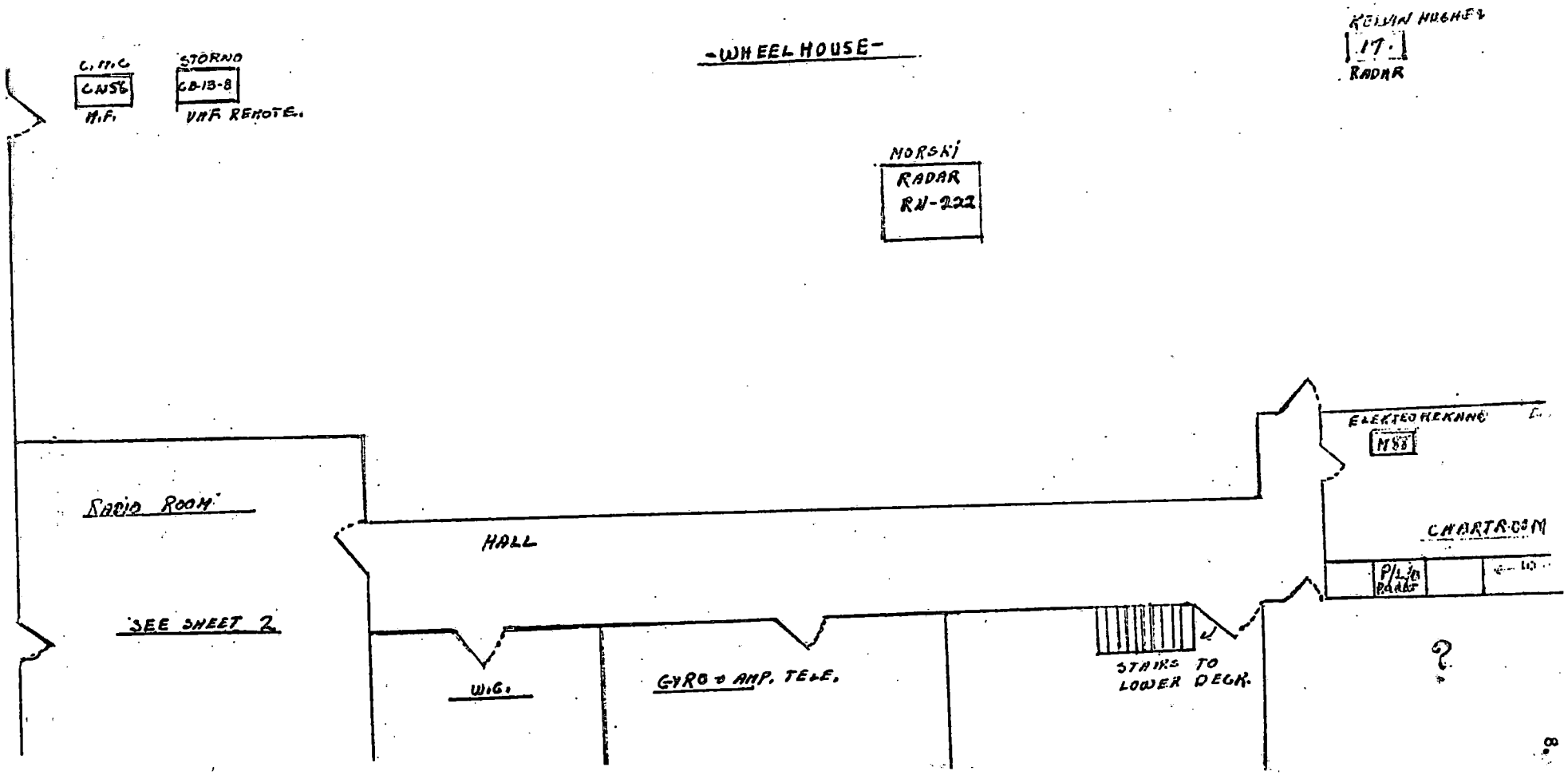

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GERMANY

IV.

TRANSPORTATION - Vehicles
Supply to Iran

1. There are rumours to the effect that Germany will supply Mercedes Benz trucks to Iran. (See item #V1, page 11, this issue).

Report & Date: IR/39/66 dated 7 September 1966
Source: CFA/Pakistan

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V. IRAN

TRANSPORTATION
Military Vehicles, Sept 66

1. Iran appears to be a middle man for the acquisition of equipment (vehicles). (See item #1, page 11, this issue).

Report & Date: IR/39/66 dated 7 September 1966
Source: CFA/Pakistan

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VI. PAKISTAN

MILITARY EQUIPMENT
Vehicles, Sept 1966

1. It is generally known that Pakistan is shopping around for military hardware of all types, apparently with considerable success, although we see relatively little of it. There are new numerous Russian type soft-skinned vehicles (trucks and command and recce vehicles) here, as well as Teyota land cruisers to replace the USA jeeps.

2. Source has heard rumours to the effect that Germany will also be providing trucks. The story is that Mercedes Benz is providing 2,000 trucks through Iran. The chassis including engines are to be shipped to Teheran where the bodies will be built by Shah Factories and the complete trucks then shipped to Pakistan.

3. The acquisition of soft-skinned vehicles is probably not too important, but this particular channel of supply is rather interesting because Iran seems to be a middle man for the acquisition of equipment by Pakistan.

Report & Date: IR/39/66 dated 7 Sept 66
Source: CFA/Pakistan

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VI: PAKISTAN

SUBMARINES
Chinese, September 1966

1. A rumor was heard in September 1966, to the effect that the Pakistan submarine PNS Ghazi is due to return to the USA for overhaul in April or May 1967 and that she will be replaced by two Chinese submarines. Source was unable to ascertain whether the replacements will be of a temporary or permanent nature.

2. The Chinese submarines mentioned are apparently being built at Shanghai and will be completed shortly. It is alleged that one of them will arrive here before Ghazi leaves sometime between December and February and that the second will arrive sometime next year.

Evaluation: C-6
Report & Date: 41/66 of 9 Sept 1966
Source: CFA/Pakistan

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VIII. USSR

TRANSPORTATION - Highways
Moscow-Kiev Highway, August 1966

1. On a road trip from Moscow to Kiev, early in August 1966, source travelled on the newly-opened-to-foreigners road from south of Orel to Kiev instead of by the old Intourist route via Kharkov.

2. The road was entered at the intersection some 50 - 60 Km south of Orel, and passed the military check-point there without question. He was, however, stopped by a militiaman some 75 km. along the highway at the intersection with the road to Zheleznaruda, who asked for "marshroutna" and declared the road was closed to foreigners. Source explained at length that the MFA had indicated by note that it was now open, that he had informed the MFA he would use it and that there had been no objection; and after checking with his headquarters first in Glukhov and then in Kursk, the militiaman allowed source to proceed. He was stopped again on the section of the road north of Kiev (after this road has joined the Leningrad-Kiev-Odessa highway) but was allowed to proceed after a brief oral explanation.

3. From source's observation, there is nothing of intelligence interest along this highway and one wonders why it has not previously been opened to foreign traffic. It passes through simple agricultural plains and is as uninteresting as most of the approved Intourist routes.

4. One exception is the town of Zhelezuaruda, which lies perhaps 3 km. off the highway and is obviously a new town. Traffic to this town is controlled by the militia post at which source was stopped. From conversation with the militiaman so it appears there is iron mining in the vicinity.

5. The highway is of good quality and in good repair; it was possible to maintain - with a heavily loaded car - a speed of 60 m.p.h. for the greater part of its length.

6. From source's point of view, the chief value of this road is the reduction by 400 - 500 km. or a whole day of travel to Kiev, in place of the previous route through Kharkov.

7. It may be of interest to mention that the 83 km. highway from Kishinev to the Rumanian border at Leyshenny is in poor repair (though like silk compared to the 50 km. on the other side of the border!) Source found his maximum speed on this run to be 35 - 40 m.p.h. No major difficulties - and no new construction - were encountered; the road has merely deteriorated.

Report & Date: IR M-88/66 dated 30 Aug 66
Source: Reliable Canadian

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IX. USSR

TOPOGRAPHICAL INTELLIGENCE
Moscow-Warsaw Trip
September 1966

1. The Canadian Naval Attache made a road trip to Warsaw 10-11 September 1966, and returned 16-17 September.

OBSERVATIONS

2. Reference is made to the "Road Journey, Moscow - Brest" (Item XVI in JIB(CAN) 16/66). Observations will hold for either outgoing or incoming trip unless otherwise designated. Reference is made to Kilometer numbers from Moscow and LHS is South and RHS, North.

Serial No.	Km Ref	Installation or observation
-	K26 RHS	Radar site - Barlock and a variety of Sponge Cake radars. It is suggested this is a radar experimental site
3	K67 RHS	Kubinka Airfield - nothing seen.
-	K62-70 LHS	"Doghouse" radar ? The eastern end has a small derrick over the gable peaks.
-	K72	The road had recently been prepared for the stopping of vehicles. In the ditches were driven posts three feet high and in reserve on the side for placing on the road when required were four foot long multistar shapes (similar to children "jacks") made of railway tracks. All were freshly painted and looked recently installed. They would stop most wheeled vehicles but not medium sized tracked machines.
-	K83 RHS	Vesna tower.
-	K86	Police check point.
-	K108	Paved cross-roads - 18 foot wide - 4 military trucks (10 Sep) soldiers seen parked on road leading south. (Corner has monument to war of 1812)
-	K114	Paved cross-road - 18 foot width.
-	K120	" " " " " "
-	K126	Paved road to South.
4	K130	Road paved 24' width to north to Borodino. Road south - gravel 18' wide.

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(Moscow-Warsaw Trip Sep 66)

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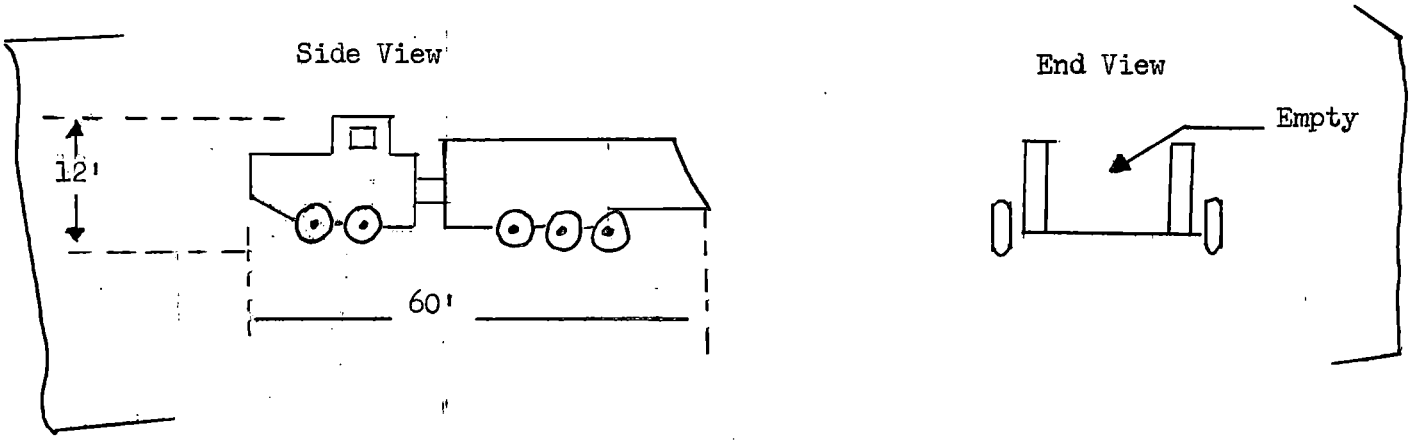
Serial No.	Km Ref.	Observations
-	K444 RHS	Vesna tower
-	K457	Russian-Bello Russaya border. Foot and mouth disease prophylactic station.
-	K501 LHS	Radar site - Barlock, Flat face, Sponge cake, Knife rest.
-	K543 LHS	New factory which uses petroleum as raw product.
7	K545-547RHS	"Goal Post" radar ? - hard to see as only visible in narrow valley.
-	K550-552RHS	Radar site - 4 Knife rest, Sponge cake, etc.
8	K573	No activity seen in vicinity of Bobr A/F.
9	K580	If there is an ammo depot it is burried in the middle of a ramshackle village.
10	K585	No sign of any military activity in vicinity of village of Krupki.
-	K590 RHS	Vesna tower.
11	K593	Krupki oil depot difficult to observe because of foliage on trees. Apparently no new construction.
-	K626 LHS	New large pulp mill on west side of river bank.
13	K630	No activity seen in vicinity of Borisov A/F. Hound Helo seen airborne.
-	K634 LHS	Vesna tower.
14,16,17 &19	K632-38	Obviously Borisov is a military town and Infantry, Artillery, Engineering, and Construction troops seen.
20	K650 LHS	Zhodino "Bellorussian" automobile works. Only vehicle visible seemed to be dump-truck. New large extension being erected to West.
21	K650 LHS	Height of chimney perhaps 125' and 15' wide - Yellow smoke emerging.
	K660 RHS	On hill top 1K to N by wooden fire observation tower were parked 2 military Comm. vehicles with jury aerials rigged across some 100' of space.



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(Moscow-Warsaw Trip Sep 66)

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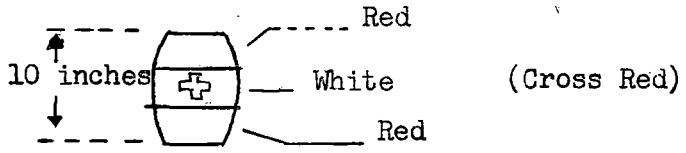
Serial No.	Km Ref.	Observations
5	K134.2	No road to north. Serial appears to be in middle of village.
-	K140	Cross-roads paved both ways, 18' width - Vesna tower LHS.
-	K146 LHS	Small mud road with small bus mired.
-	K179 LHS	Vesna tower.
-	K228 LHS	Vesna tower and TV transmitter.
-	K229 LHS	Radar site, 2 Barlocks, etc.
-	K262 LHS	Vesna tower.
-	K297 LHS	" "
-	K295	Foot and mouth disease prophylactic station.
-	K297 RHS	At least 6 large coal mines (Safanova).
-	K305 LHS	Radar site - Flat face, Knife rest, etc.
-	K309	Foot & mouth disease prophylactic station.
-	K320	Sep.10 - BTR 60P on road with white lettered numbers 183 and badges approx as follows:



-	K329 RHS	Appears to be an oil drilling derrick actively changing boring bits.
-	K337 RHS	Besna tower.
-	K384 LHS	Road South to Smolensk (7K away)

Road to Smolensk

-	K3.6(to West)	Radar and communication site. Possibly associated with Tall King installation - Knife rest, etc. Well fenced and with watch towers.
6	K2.5(to West)	Smolensk airfield. Military aircraft was probably 3 Coke (one #40) and 2 Crate - Sep 16 - sound of jet aircraft taking off was heard. On 10 Sep 2 Farmers and 1 Crate were seen airborne in the vicinity.

Road to Brest

-	K387-398LHS	Radar site. Tall King - 6 Knife rest, etc. Best views at K 396. No sign of reported SAM sites in vicinity.

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(Moscow-Warsaw Trip Sep 66)

SECRET
JIB(CAN) 26/66

Serial No.	Km Ref.	Observations
-	K690(cont'd)	Painted olive green - no markings, numbers or licence plates.
23	K693 LHS	Army barracks. Soldiers with magenta shoulder colours.
24	K692	No activity seen in vicinity of Slopyarna A/F.
Poss 23	K693 RHS	Magneta coloured soldiers seen in military barracks, only transport vehicles seen in park.
25 & 26	K696 & 700	These airfields are believed now non-existant and are given over to a housing development.
-	K696 RHS	Hidden in trees are 2 Knife rests and small micro wave tower some 1 K to north.
Note -at K696		Road splits. Road to south by-passes Minsk, the other goes to city centre. By-pass joins main road at K 712.
(on by-pass)	10K SE	Minsk centre - radar site 2 Barlock, 1 Sponge cake, 1 Flat face etc.
(on by-pass)	6K S	Minsk centre RHS - appears to be Minsk civil A/F IL18, AM10, etc. Aeroflot markings seen in air paths. Near SE edge of field is seen 2 Fork rest and radio aerials.
-	K712-739	Dual carriagway type new highway under construction New road on north side.
-	K724 LHS	On Pteyov River is a new small dam and spillway.
-	K726 RHS	Large new resort or rest area.
34	K738	Only open fields seen. No military barracks.
	K735-740	At least four Blinder aircraft seen to take off from near by field (which side ?) and proceed S (16 Sep at 1520)
-	K746 RHS	Military barracks. High fence manned watch towers. Green tabbed soldeirs. Many cable drums of wire seen.
	K745 LHS	Vesna tower.
	K746 LHS	Very high and prominent wooden fire watching tower.
36	K758	Water tower of red brick is only some 125' high 2 K south.
-	K784 RHS	Radar site 1 Flat face, 2 Knife rest, 1 micro wave tower, 1 thin skin type.
	K791 RHS	Vesna tower.
	K820-833	From A/F some 10K south of highway at least 11 Blinder aircraft took off at four minute intervals about 1400 16 Sep and flew to the west.
	K841 LHS	Small radio station on hill.
	K897 RHS	Vesna tower.
44	K910(approx)	No sign of MRBM/IRBM or SAM activity seen anywhere.
45	K941	Vesna tower.
46	K945-47	No barracks seen.
	K966-RHS	Colt aircraft parked on field (possible crop duster).
46	K947	No road seen going south but at K 947 a small secondary road proceeds in southerly direction.

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(Msocow-Warsaw Trip Sep 66)

SECRET
JIB(CAN) 26/66

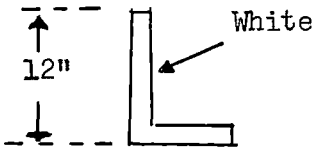
Serial No.	Km Ref.	Observations
-	K983	Foot & mouth disease prophylactic station.
-	K991 RHS	Vesna tower.
48	K1001	Kobrin A/F - 6 Hooks 8 plus Hounds, Hen House series low pitch activity. No new construction.
-	K1026 LHS	Circular erection of poles 15" high 100" in diameter (Possibly a Hop field)
-	K1030 LHS	200' TV transmitter.
50	K1042	No military activity seen.

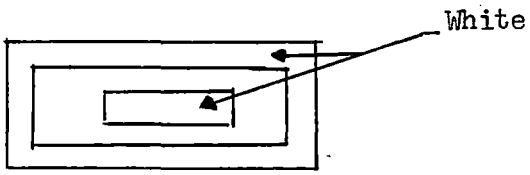
Outskirts of Brest:- 11 Sep - apparent temporary Helo field had some 40 Hook and Hound Helicopter right adjacent to heavily built up area. A new mobile Hen series installation was being set up. All had gone on Sep 16.

(Road route from Brest to Warsaw - Kilo's road from Warsaw)

4 Kilo's inside border - Rail gauge change over yards - no military traffic seen.

-	K186	4 military ZIL 157 with Russian licence plates (no markings) seen proceeding east. (11 Sep)
-	K159	2 HQ vehicles and 3 servicing vehicles parked facing W with Polish military.





Note: Trip took place between 0600 and 0800 (Polish time) - 10 Sep. 66 for this sighting and those below.

Report & Date: IR N-124/66 dated 20 September 1966

Source: CNA/Moscow

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JIB(CAN) 26/66

X. USSR

TOPOGRAPHICAL INTELLIGENCE
Novosibirsk, 9-11 August 1966

1. The Canadian Military and Air Attaches made a trip to Novosibirsk 9-11 August 1966, where they made the following observations.

General

2. The population of Novosibirsk exceeds one million people. It is a matter of some pride to the inhabitants that this figure has been reached in the brief sixty-odd years of its existence.

3. Notwithstanding its youth and the very great amount of new construction completed in the past few years, and still going on, it is a fairly typical Soviet city with little to distinguish it from any other major Soviet city. To these observers however, the construction appears more durable than much seen elsewhere although there is nothing distinctive about most of the architecture. Architectural exceptions are the Opera and the Dom Sovietov.

4. Public transport is extensive and apparently efficient. Old trams still ply many of the longer routes although there are also extensive trolley bus and auto bus systems. Tram and bus schedules could not be purchased at any of the several kiosks and book shops visited. It was noted, however, that trams #1, 2, and possibly 7 run N on Serebrennikovskaya from the opera theatre to Gogolya, then E to turn at the circle shown on Kamenskoye Shosse at Chkalov Park. Tram #11 continues eastward along the Shosse.

5. Travellers saw but one small Orthodox church, on Ul Sovietskaya. It is a "Working" church.

NOVOSIBIRSK

JIB Serial (TFP 215)

Observations

A 15

The Science Center is located some 25 - 30 Km South of the city and EAST of the highway leading to Berdsk. Sources car turned EAST at the Northern edge of the complex, proceeded for approximately 1 Km along a broad street flanked by apartment

/blocks,

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(Novosibirsk, 9-11 August 1966)

SECRET
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USSR

JIB Serial (TFP 215)	Observations
	blocks, then South for approx 1 Km along Pr Nauki which is flanked on both sides by twelve institutes and the University; then WEST also for approx 1 Km along an other broad street flanked by apartment blocks. No unusual buildings were seen. The institutes seen included those of Organic and Inorganic Chemistry, Hydrodynamics, Geology and Geophysics.
A 17	Travellers were given a fast ride to the Novosibirsk Hydro Electric Station. Accurate observation was difficult. There are four lock gates, 3 locks. The locks are roughly estimated not less than 200 ft long and not less than 40 ft wide. Three power circuits run EAST from the power plant. One is much higher voltage than the other two but a shed count was impossible. One of these circuits may be the supply to the Science Center. Pylons are lattice steel.

6. Following the taxi tour travellers walked Ul Lenina (formerly Pr Stalina) and Ul Sovietskaya. The following were noted.

60	The Garrison Commandant is at Ul Lenina 10. This is a small old building, the lower floor masonry, the upper wood. It has a small courtyard on the WEST side.
66	33 Ul Sovietskaya is the main Post Office. On the top, were two MERCURY GRASS mounted on a single pole mast one above the other, oriented roughly E - W. On the roof of a building almost immediately SW of the Post Office were two square parabolic dishes oriented southward. These appear similar to the ones reported earlier, except that, although one had approx 12 horizontal bars, the other had about the same number but they were vertical.
68	Ul Sovietskaya 31 is a conservatory. It is being enlarged by the addition of a fourth story, new wings at NORTH and SOUTH ends and is being extended in depth to the rear.

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(Novosibirsk, 9-11 August 1966)

SECRET
JIB(CAN) 26/66

JIB Serial (TFP 215)	Observations
	ZAGS Zheleznodorozhny Rayon is at Sovietskaya 47.
Not 47	At the North end of Ul Uritzkovo is a large four storey masonry building housing the Ministry of Communications Routing (Putei Soobshenyi). On top of the building are one large and two small round solid dish antennas oriented slightly EAST of NORTH.

7. During the afternoon of 10 Aug travellers walked NORTH on Krasnyi Prospect to Gogolya, thence EAST on Gogolya to the cemetary thence along Ul Dzershinekovo (formerly Kaminskaya Shosse) to a point beyond Chalkov Park. The following were noted.

57	Krasnyi Pr 38 Houses the Evening (Vechernyi) University and the Party School of Marxism and Leninism.
48	On the SOUTHEAST corner of Ul Frunze on Siberennikovksaya a four story masonry building approximately 200 ft by 200 ft behind a masonry and steel fence. There is a courtyard at the WEST end of the complex but a very effective wall. and gate prevent observation. A Volga staff car VRN 75-40 YC and a jeep VRN 40-01 ΩC were parked near the gate on Frunze.
74?	On Frunze Opposite Serial 9 is the Academy of Science
	Krasnyi Pr 64 has a military association. This is an unsigned grey masonry building at the front of one wing of a large apartment block. An engineer Major (on black) entered the building as travellers approached. On a subsequent visit two U/I soldiers in summer field uniform left the building as travellers approached and a SAF captain left after travellers had passed.
	At 38 Ul Dzerzhinskovo is the Military "Kansolaria"? for Dserzhinskovo Rayon.
	At 40 is ZAGS, Dzershinskovo Rayon.
13A	A large, apparently industrial, complex fronting about 1500 feet behind a solid fence 8 - 10 ft high. The top of a hangar type structure 80 - 100 ft high could be seen 200 - 300 metres from

/the street.

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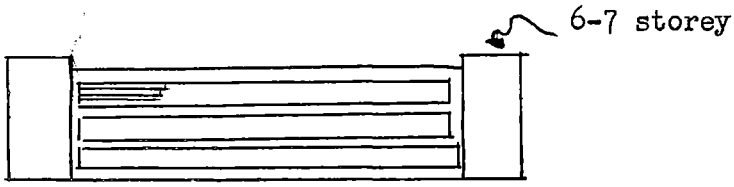
JIB Serial
(TFP 215)

Observations

the street. Adjacent and to the EAST and facing the main gate a long administrative type building. At the top of a large sign near the main entrance to this building was the word 'INSTRUCTSIA' in large letters. The remainder of the sign could not be read. Adjacent to this and to the EAST, a long (estimated 400 ft) brick building under construction. The front is heavily glassed and appears to have three floors. The EAST face (Approx 40') has 7 rows of smaller windows not at regular intervals.



The whole complex has security lighting. Travellers attempted to penetrate around the EAST end but the dirt road petered out into nothing. On the return, travellers were escorted past the complex by two pairs of surveillants. No unusual sounds were heard and no more unusual buildings seen then those described above.

7. On the morning of 11 Aug travellers walked NORTH on Krasnyi Pr to Zayel'Tsovsky Rayon, walked WEST about 1 Km on Ul Dusi Kovalchuk, back to Krasnyi, then NORTH another 1 Km, then returned SOUTH on KRASNYI to Ul Lenina and back to the hotel. The following were noted.

29? The last building on the EAST side of Krasnyi Pr South of the railway is probably 88 which is a dingy 5/6 storey factory type building. It is unsigned and no indication of type of activity was observed. The area NORTH of the railway on the EAST side extending to a deep ravine with a small stream is taken over as a large apartment block development.

29? Krasnyi Pr 86 is a large 5/6 storey blue-gray building also unsigned. There was no evidence of any activity of any kind.

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(Novosibirsk, 9-11 August 1966)

JIB Serial (TFP 215)	Observations
29?	Krasnyi Pr 84 is a large dark office building with 8 stone columns at the main entrance. It is set back from and above the street. The several signs could not be read but with the exception of one they were black with gold letters.
8	On the SOUTH side of Ul Dusi Kovalchuk approximately 500 M from Krasnyi Pr an industrial/research complex behind a high wall. The buildings are unnumbered and unsigned. No indication of type of activity. At the WEST end of the complex is a long, bright building. The number of floors was not determined. The front of the building is about 60 percent window or glass blocks. Also at this end of the complex, a fleeting glimpse of 3 or 4 slender vertical metal storage tanks. One tall brick stack, probably associated, was not emitting any effluent.
7A	At Ul Dusi Kovalchuk 191 is the Institute of Rail Transport Engineers. Near serial 19, a convoy of seven trucks with steel security boxes with small windows passed travellers headed WEST. Vehicles had civilian VRNs. East vehicle had perhaps 12 occupants. Occupants wore brown uniforms and might have been military. This, however, may also indicate the presence of a forced labour camp in the vicinity.
7	Fronting approximately 500 ft on Ul Dusi Kovalchuk and approximately 1500 ft on Krasnyi Pr is a large industrial complex. A high wall and heavy foilage prevented effective observation. However views from the WEST side of Krasnyi Pr and from a point approximately 500 M SOUTH of the complex suggest the following approximate layout. The perimeter is security lighted.

(SKETCH ON NEXT PAGE)

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(Novosibirsk, 9-11 August 1966)

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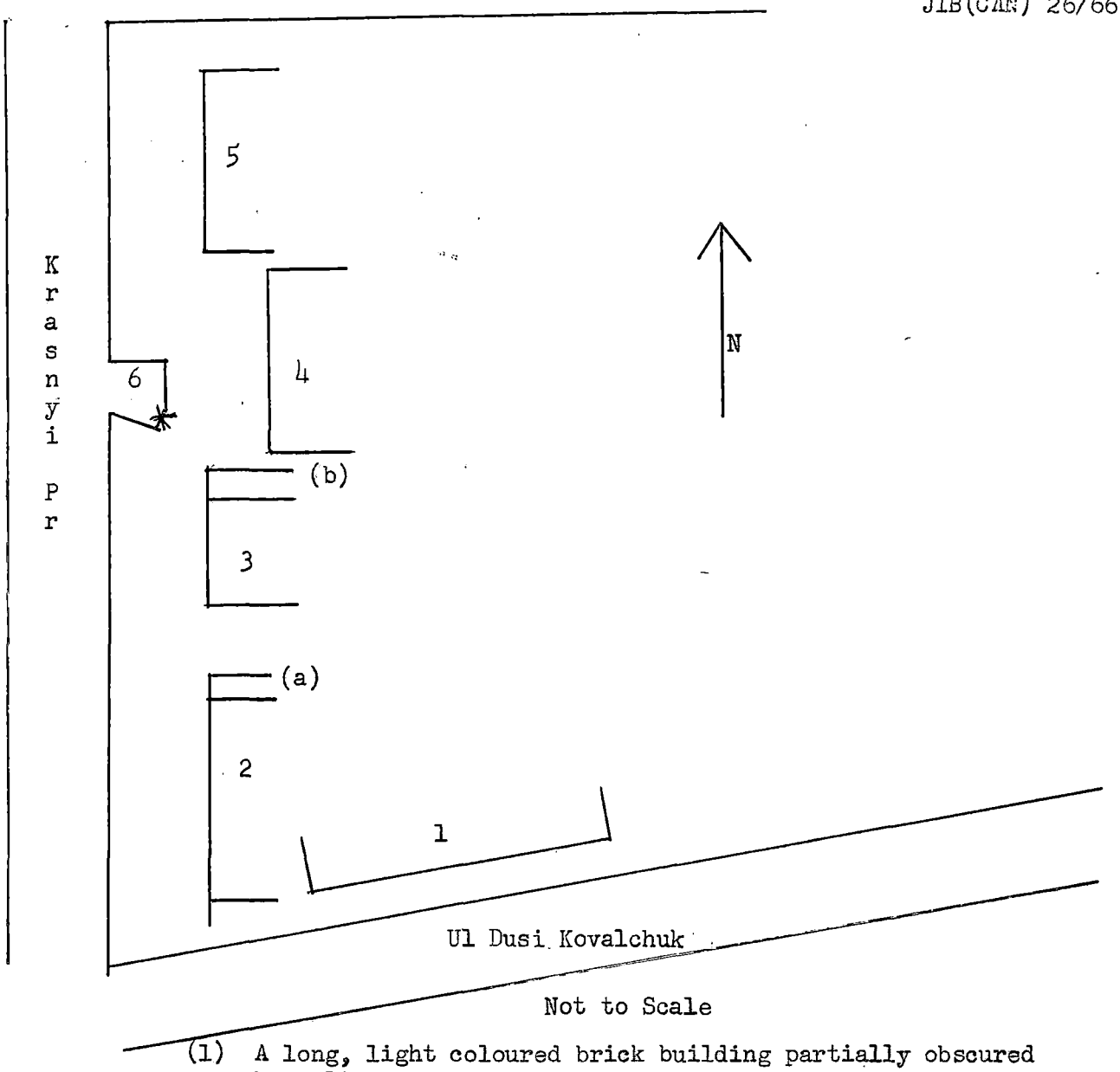

Not to Scale

(1) A long, light coloured brick building partially obscured by foliage.

(2) A pinky-yellow ochre coloured building of about 4 stories; (a) is a wing about 20 ft higher than the remainder of the building. It has a small rectangular antenna mounted on the top.

(3) A similar building to 2 but smaller. It also has a raised wing (b) but not as high as 2(a).

(4) A long low red brick building. The front face has several sheet metal hooded stacks rising, apparently, from the ground floor.

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(Novosibirsk, 9-11 August 1966)

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(TFP 215)

Observations

(5) A light coloured grey brick building, 5/6 stories high. It has two rows of small wooden structures on the roof, probably over ventilators. On the SOUTH face of the building is a sheet metal hboded stack about 2/3 the height of the building which rises from a sheet metal header. Only the top edge of the header is visible.

(6) The main gate. A few cars and motor-cycles were parked in the small enclosure. A guard was checking documents of the few people entering.

5 Immediately NORTH of Serial 21 another complex behind a high stone wall with an iron fence on top of this. All that could be seen of this complex were two dark stone buildings of about 4 stories. Set back from the street perhaps 200 feet. The two buildings, one of 450 ft frontage the other 600, are joined by a covered passageway below which there is a 3 arch passage through to the rear area. In the space between the buildings and the wall there are trees, and fountains were heard flowing at both the NORTH and SOUTH ends. Extensive perimeter security lighting was observed. At the NORTH end, through a narrow gate, the boundary fence was seen to extend to the EAST for perhaps 1000 ft. The frontage of the complex on Krasnyi is estimated at 1500 ft. The complex is unsigned and unnumbered.

34 Dom Offitzercy is at Krasnyi 61. On Ul Gogolya at the rear of the building are among others the offices of "Military Tribunal" and "Military Procurator". Behind the building is a small transport compound. One light cargo vehicle VRN 55-55 K4 was parked at the rear when travellers passed.

40 HQ Siberian MD is 53-55 Krasnyi Pr. The number 53 is at the SOUTH end and 55 at the NORTH. The building is unsigned. The side entrance on Derzhaiuna was most used. Parked at the side entrance were a staff car with military driver (VRN 0001 A4), a jeep (VRN 0102), a military ambulance and a military truck. At the back of the building there is a fence across a courtyard with an armed sentry. On the roof of the building are mounted three small antennae facing S. They appeared roughly as follows:

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(Novosibirsk, 9-11 August 1966)

SECRET
JIB(CAN) 26/66

JIB Serial (TFP 215)	Observations
79	Militsia HQ is on the NORTH side of Kommunistichiskaya in the block EAST of Krasnyi Pr.
75	On Krasnyi Pr between Ul Kaboschaya and Ul Maxima Gorkovo set back from the street is a large factory type building. On the roof are two mast antennae, the taller guyed at 3 points is estimated 40' high. Nothing was seen to indicate the type of activity.
9.	On the way to the Airport the following were noted.
100	The highway bridge across the Ob.
	The street leading from the road bridge into Kirovsky Rayon is Pr Karla Marxa. About a Km from the bridge on the SOUTH side are located the Institute of Commerce and the Institute of Electro-Technology. The latter is the "largest of its kind in the USSR with an enrolment of 3000 students".
112	The television center has one tall TV mast which the travellers understood the driver to say is 170 M high. There is another steel lattice tower under construction nearby. Detailed observation of the TV tower was not possible.
101?	Travellers seen lost orientation driving through Kirovsky Rayon. The taxi had to stop and wait for a train on the main Trans-Siberian line. Approximately 1 Km WEST of this point is a large industrial complex with two very large hangar type structures facing the railway. The driver who had been very talkative to this point suddenly hadn't a word to say.

Report & Date: IR A-88/66 and M-81/66 dated 17 August, 1966.
Source: CMA/Moscow

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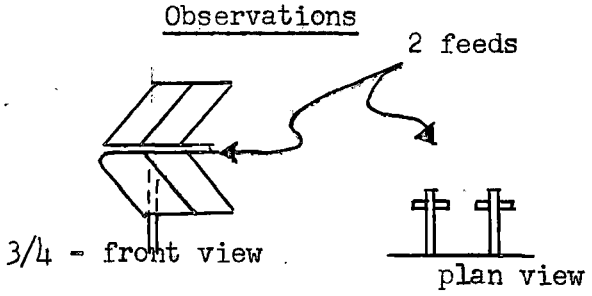
(Novosibirsk, 9-11 August 1966)
JIB Serial
(TFP 215)

SECRET
JIB(CAN) 26/66

Observations

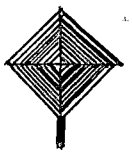


In the vicinity were seen:

1 Col MR
1 U/i Lt Col
1 U/i Major
It/Capts Engr/blk, Sigs/blk, Arty/blk, and Tk/Blk.

Krasnyi Pr 45 houses Voyentorg 201 and the MD Directorate of Military Commerce?

48B This is an unsigned building. It had a U/I soldier sentry at the entrance on Krasnyi. A Col SAF entered the compound at the back as travellers passed. Two SAF colonels, 2 Lt Cols SAF and a Major SAF were seen in the vicinity. On the roof were mounted 1 MERCURY GRASS, 2 discones and 1 small square antenna similar to the sketch below



8. On the afternoon of 11 Aug travellers did a final short walk SOUTH on Sovietskaya, EAST on Kommunistichiskaya, SOUTH on Krasnyi, then NORTH up the EAST side of Krasnyi and finally back to the hotel. The following were noted:

86 OBKOM and GORKOM Offices one in a large grey masonry building at Krasnyi Pr 5.

88 ? At Krasnyi Pr 3 is a hospital. Only the word Boinitza could be read through the foliage.

84 The offices of the Oblast Soviet are at Krasnyi Pr 18.

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SECRET
JIB(CAN) 26/66

XI. U.S.S.R.

SHIPPING - Fishing Fleets
Soviet Trawler MOGILEV
Halifax, 23 September 1966

1. The Soviet Trawler MOGILEV (callsign not known) (RT 319) arrived Halifax 23 September departed midnight.

Narrative

A. MOGILEV was towed into Halifax by the Soviet tug KAPITAN NOKHRIN, the trawler anchoring in the commercial anchorage in the vicinity of Georges Is., the tug running alongside the trawler.

B. The repair work to the trawler's propeller packing gland was carried out by divers from the tug. The work took approximately eight hours.

C. This is the third of this class of ship to develop propellor packing gland defects within the past month. In all cases the ships were towed into Halifax by the KAPITAN NOKHRIN, all anchored at the commercial anchorage and all were repaired by divers from the tug. The vessels (faulty) by this defect together with the dates the repairs were effected in Halifax harbour are as follows:

(i)	SEVER (RT 207)	12-13 September 1966
(ii)	STAVRIDA (RT 313)	29 August 1966
(iii)	MOGILEV (RT 319)	23 September 1966

D. Time did not allow the gathering of more information regarding MOGILEV other than the above.

Date of Report: 7 October 1966
Source: DGI/INT S

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SECRET
JIB(CAN)26/66

XII. U.S.S.R.

SHIPPING - Fishing Fleets
Research Trawler ORECHOVO
Halifax, 26-38 July 66

1. The Soviet research trawler ORECHOVO (SRT-R9013) arrived in Halifax 26 July and sailed 28 July 1966. Her callsign is UJGX.

Personalities on Board

1. The Captain is Georgy DAVIDYUK.

Height:	5' 10"
Weight:	195 lbs
Complexion:	Dark
Hair:	Brown
English:	Poor
Distinguishing Marks:	Wears moustache. Has two gold teeth, upper right.

Date of Report: 9 Sept 66
Source: DGI/INT S

SECRET

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SECRET
JIB(CAN) 26/66

XIII. U.S.S.R.

SHIPPING - Fishing Fleets
Soviet Research Trawler OLONETS
Halifax, 27-28 September, 1966

1. The Soviet Research Trawler OLONETS (callsign UBLB) (SRT-R9075) arrived Halifax 27 September and departed 2000 hrs 28 September.

Personalities on Board

2. A. Captain

(1) Name - Victor LITUN
Age - 32 years
Height - 5 ft 10 ins
Weight - 180 lbs
Complexion - Fair
Hair - dark blonde brushed straight back

English - nil
No visible marks or scars.

3. This captain was formerly the chief mate of the Soviet trawler OLEKMA in 1964/65 and also chief mate of the Soviet trawler ATLANT in January 1966. His seaman's passport number is now 265206, but when he was chief mate of the OLEKMA his number was 081718.

4. Engineer

Name - Oleg MESHKOV
Age - 21 years
Hair - Long (female type) dark

This man was described by source as being a real "beatnik" type, who dresses, speaks and acts in the manner of the "beatnik" type of person. He speaks perfect English with only a minor trace of accent. Although he is classed as an engineer it is not known in what capacity he is employed since the crew lists his name separately from the regular ships engineers.

Date of Report: 7 October 1966
Source: DGI/INT S

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Document divulgué en vertu de la Loi sur l'accès à l'information

XIV. U.S.S.R.

SHIPPING - Electronic Report
Soviet Mership BRATSK,
Montreal, June 1966

1. The Soviet mership BRATSK arrived at Montreal in June 1966. Her port of registry is Leningrad, callsign UIAC, and she carries 2 radio operators (first and second class).

TRANSMITTERS

MAKE	MODEL	FUNCTION	FREQUENCY RANGE	POWER KW
BLESNA SW	N 0202	MAIN	365-550 KCS	.250
" KW	N 0202	HF CW	4000-22720 KCS	.250
ASP 2 - 0.06	No. 289 1957	RESERVE	586-732 METRE	.060
ERSH-R (COMB)	No. 05394 1965	HF CW&RT	1500-24000 KCS	.100
" "	" "	MFRT	365-550 KCS	.100
KORABL	N.000647 1966	VHF RT	148-174 MCS. ITV CHANNELS 1-27	0.010
CMC	6N86	MF RT	1.6 - 9.0 MCS	.060
NEPTUN	2044 1957	RADAR	1.5 - 30 MILES 9375 MCS	?

RECEIVERS

MAKE	MODEL	FUNCTION	FREQUENCY RANGE
WOLNA	No. 0092 1959	MAIN #1	12 KCS - 23 MCS
WOLNA K	No. 19636919	RX #2	12 KCS - 23 MCS
PAS-2	N.830 1959	RESERVE	380 - 600 METRES
APH-54	N. 482 1959	A.A.	500 KCS (PASS BAND 492-508 KCS)
SRP	No. 4062 1955	D.F.	86-376 KCS & 375-750 KCS.
NEPTUN	2044 1957	RADAR	9375 MCS 1.5 - 30 MILES (FREQ RANGE NOT AVAILABLE)
KORABL	N.000647 1966	VHF RT	148-174 MCS ITU CHANNELS 1-27

TRANSMITTING FREQUENCIES

MF - 410-425-454-468-780-500-512-KCS

HF - 4140-4182-4212-6210-6270-6318-8280-8364-8424-12420-12540-12636-16560-16728-16848 KCS.

RESERVE - Metres 586-600-625-641-661-706-732

VHF - ITU CHANNELS: 1-2-3-6-7-9-11-12-13-14-16-18-20-22-26-27

P/L 500 & 8364 KCS RADAR ? (9375 MCS)

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SECRET
JIB(CAN) 26/66

(BRATSK Electronic report, June 1966)

LIFEBOAT RADIO APPARATUS

MAKE	MODEL	FREQUENCIES	FUNCTION	POWER KW
DISA MARINETTA (Ser 1655)	71A11	500 & 8364 KCS		
CMC	CN 86	1.6 - 910 MCS	MF RT	1060
AKACIJA	590859	132.0 - 126.25	-	-
PDU	N000631 1965	122.5 - 125.0 MCS	VHF REMOTE CTL	
CMC	CN 86	1.6 - 9.0 MCS	MF RT	
AKACIJA	590859	132.0 - 126.25-122.5-125.0 KCS	VHF RT	

ANTENNAE

Ant.	RIT INVERTED V. 35 FT. for CN-86		
	SW MAIN ANT	Horizontal 50 ft. long.	Height above sea level
	KW T ANT	70 metres long.	unknown

NOTE: MF RT (CN 86) rented for this particular voyage on the G/L only.

Date of Report: 8 August, 1966
Source: DGI/INT S

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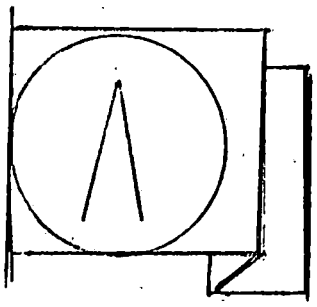

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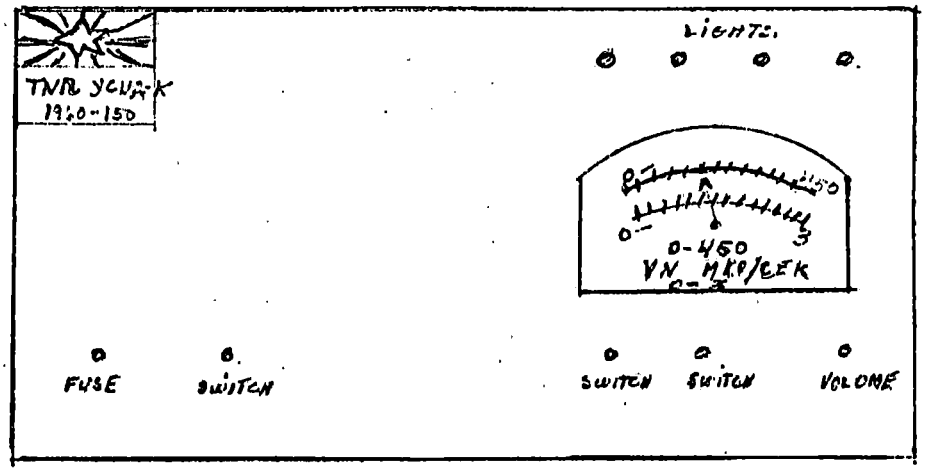

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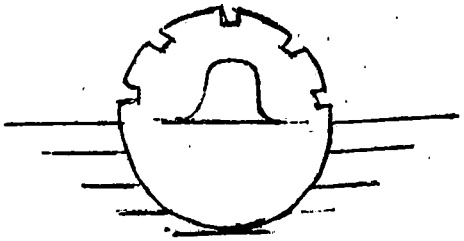

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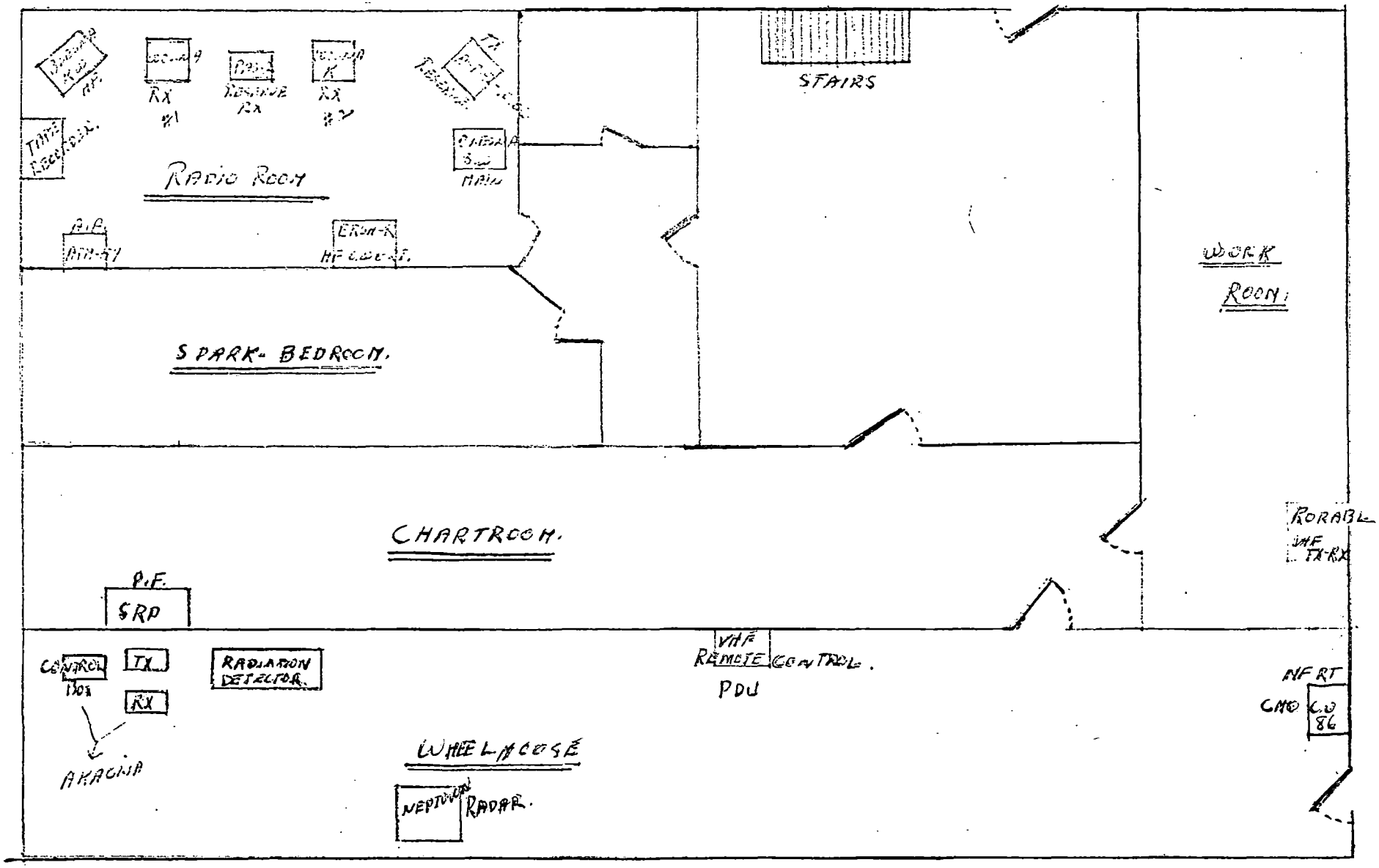

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XV. U.S.S.R.

SHIPPING - Electronic Reports
Soviet Research Trawler ORECHOVO,
Halifax, 28 July 1966

1. The Soviet research trawler ORECHOVO was inspected in Halifax on 28 July 1966. Her callsign is UJGX; port of registry, Kaliningrad; gross tonnage, 700; one radio operator is carried.

Date of Report: 9 Sept 66
Source: DGI/INT S

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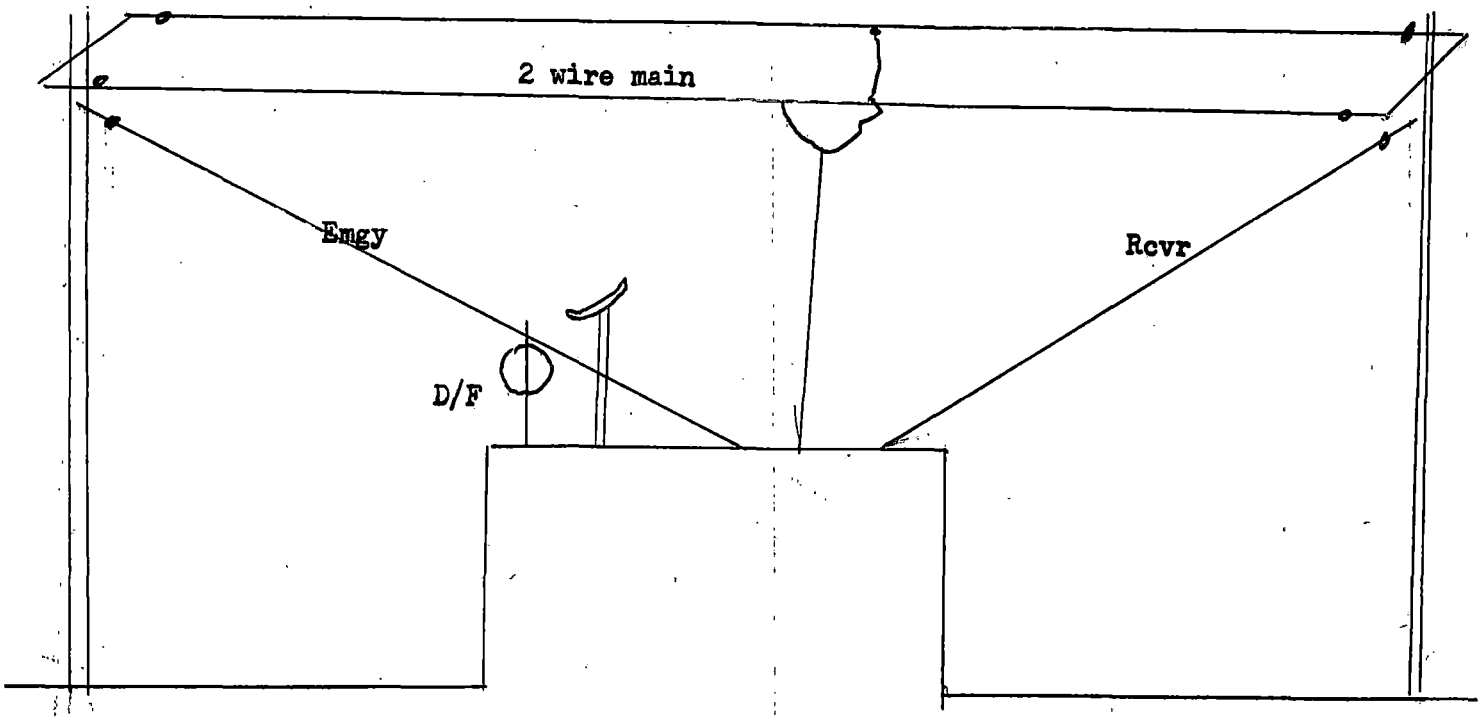
VISUAL INSPECTION - ANTENNA SYSTEM



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(Research Trawler ORECHOVO,
Halifax 28 July 66)

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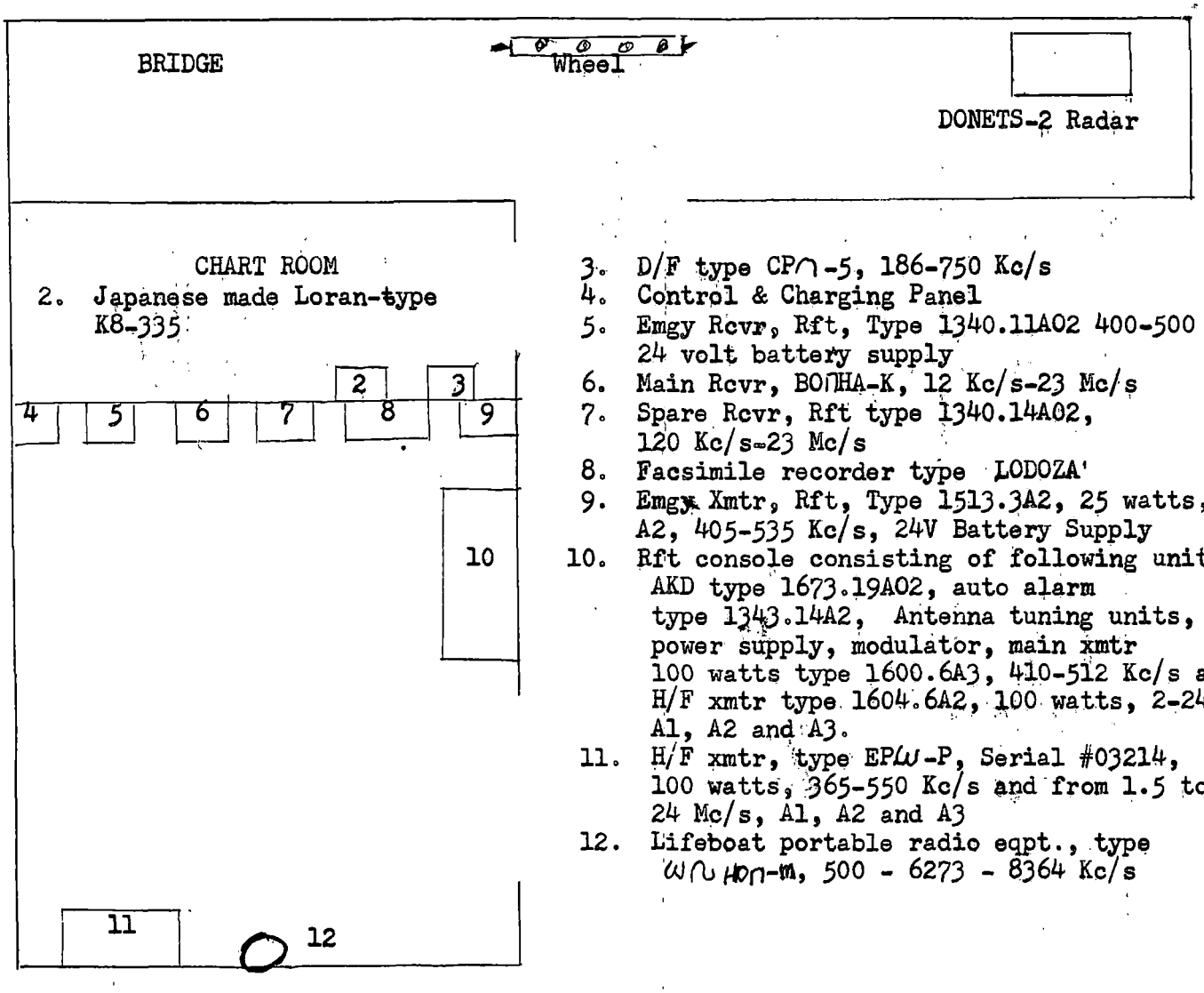

3. D/F type CPП-5, 186-750 Kc/s
4. Control & Charging Panel
5. Emgy Rcvr, Rft, Type 1340.11A02 400-500 Kc/s 24 volt battery supply
6. Main Rcvr, BOПHA-K, 12 Kc/s-23 Mc/s
7. Spare Rcvr, Rft type 1340.14A02, 120 Kc/s-23 Mc/s
8. Facsimile recorder type LODOZA'
9. Emgy Xmtr, Rft, Type 1513.3A2, 25 watts, A2, 405-535 Kc/s, 24V Battery Supply
10. Rft console consisting of following units: AKD type 1673.19A02, auto alarm type 1343.14A2, Antenna tuning units, power supply, modulator, main xmtr 100 watts type 1600.6A3, 410-512 Kc/s and H/F xmtr type 1604.6A2, 100 watts, 2-24Mc/s A1, A2 and A3.
11. H/F xmtr, type EPШ-P, Serial #03214, 100 watts, 365-550 Kc/s and from 1.5 to 24 Mc/s, A1, A2 and A3
12. Lifeboat portable radio eqpt., type ШПНОП-M, 500 - 6273 - 8364 Kc/s

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JIB(CAN) 27/66

DATE October 24 1966

JOINT INTELLIGENCE BUREAU
Ottawa

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Communist Economic and Military Aid

Activities in the Underdeveloped Areas

October 1966

JOINT INTELLIGENCE BUREAU

Department of National Defence

OTTAWA, CANADA

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Communist Economic and Military Aid Activities in the Underdeveloped Areas

September 1966

PART - I ECONOMIC ACTIVITY

GENERAL

Major Trends and Developments in the Communist Economic Aid Programmes in the Third Quarter of 1966

1. In the third quarter of 1966 the communist economic aid programme in the less developed countries was highlighted by the extension of a $630 million loan to India for its Fourth Five Year Plan and is the largest single credit extended by the Soviet Union to a non-communist country. Details concerning the utilization of the new loan have not been fully disclosed but apparently $220 million will be made available in medium-term commercial credits to help finance imports associated with development projects. Other Soviet loans extended in the period included a $14 million development loan to Burma and a commodity credit for $4.2 million to Somalia to help finance the local costs of Soviet sponsored development projects. Communist China's aid contributions in the period were valued at $51.4 million and included a development credit for $42.9 million to Cambodia and $8.5 million to Tanzania of which $2.9 million was grant aid. The East European communist countries extended a total of $45.5 million in new credits. The total value of communist credits and grants extended since January 1966 is estimated at $1,289.8 million. (SECRET)

2. As in the past most of the aid extended by the communist countries is committed to the industrial sector of the economies of the less developed countries. However, in some areas (Somalia is a good example) the communist aid programme has been stalled by the inability of recipient countries to provide the local costs involved in development projects. Recently, in some recipient countries, this situation has been alleviated by the extension of Soviet commodity credits in the form of consumer goods to help finance the local cost requirements necessary for the effective implementation of aid programmes. (SECRET)

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Foreign Students in Communist China

3. According to a US report Communist China informed foreign embassies in Peking on 21 September that all students from abroad, including those students in secondary and technical schools, would have to return to their own countries for one year since professors are currently devoting their time to China's cultural revolution. Travel expenses are to be paid by Communist China.

4. In June of this year it was reported that no first-year students would be admitted to universities this fall. According to press reports students already enrolled in Peking universities, where most foreign students are located, have been caught up in Red Guard activities or are helping with the 1966 harvest. Classes normally start in September but none are currently being held and the Chinese government's action concerning foreign students suggests that it has no intention to reopen them soon.

5. It is roughly estimated that the number of foreign students, including students from the communist countries, is less than one thousand. (CONFIDENTIAL)

LATIN AMERICA

Ecuador

6. Czechoslovakia has offered Ecuador a $5 million loan, which it may increase to $10 million, for the purchase of Czech machinery. The loan would be repayable over a five-year period, but may be extended to seven years, with interest at six percent. The offer is reported to have been approved in principle.

7. In 1960 Ecuador and Czechoslovakia concluded a straight barter deal valued at $10 million, involving the exchange of Ecuadorian bananas for Czech machinery. The current transaction likely involves a similar exchange.

8. In August, 1966 East Germany concluded a trade and payments agreement with Ecuador. The agreement provides for the import of machinery and equipment, chemicals and light industrial products in exchange for Ecuadorian bananas, coffee and other goods. (RESTRICTED)

9. A recent Canadian Embassy report from Quito states that the Ecuadorian government is also interested in an East German proposal to finance the rehabilitation of the Ecuadorian railways through the sale of bananas to Czechoslovakia. (RESTRICTED)

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Mexico

10. Mexico's trade with the communist countries has increased almost a hundredfold during the past four years and is now reported to be valued at $80 million. The principal trading countries are Czechoslovakia, Poland and Yugoslavia. In 1962 their trade with Mexico had reached a value of about $800,000 and in 1964 was valued at $24 million. According to statistics, recently published by the Mexican Foreign Trade Bank, trade in 1964 was sharply boosted by large Polish purchases of Mexican corn and wheat. Poland also buys coffee, corn and copper and the trading balance is heavily in Mexico's favour since it buys only small quantities of chemicals and some light engineering equipment. Trade with Yugoslavia is comparatively small and in 1965 was confined to purchases of cotton in exchange for light machinery. Czech purchases were limited to coffee and tobacco in exchange for textiles and machinery. (UNCLASSIFIED)

Chile

11. A Soviet commercial mission has returned to the Soviet Union after spending about two months in Chile studying the possibilities of expanding economic relations between the two countries, including potential economic aid projects and increased trade.

12. As a result of the recent negotiations it is believed that agreements may soon be concluded and are likely to cover general trade, medium-term commercial-type credits similar to the recent $100 million loan extended to Brazil by the Soviet Union and probably a development credit. A major problem encountered in the trade negotiations was finding products that both countries are willing to include in trade arrangements. (CONFIDENTIAL)

13. Although a wide-range of development projects were probably discussed it is considered likely that emphasis was given to possible Soviet aid for Chile's copper industry. (CONFIDENTIAL)

AFRICA

Tanzania

14. According to a UK report Tanzania has agreed to allow 150 Communist Chinese technicians to enter Tanzania to work on the construction of a textile mill near Dar es Salaam and at least 18 Chinese have already arrived and more are expected in the near future. Originally the Chinese wanted to bring in 200 workers with most of them to be employed on the construction of the textile mill. However, the Tanzanians succeeded in reducing the number to 150. The textile mill is being built under a $28 million Chinese loan extended to Tanzania in 1964. (SECRET CANUKUS EYES ONLY)

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Rwanda

15. A Soviet economic delegation to Rwanda (see JIB(CAN) 24/66 dated 30 September) left Kigali without concluding an economic aid agreement with the Rwandan Government. Apparently the Soviet Union offered Rwanda a line of credit to be used for a geological survey in southwestern Rwanda, construction of a hospital and the provision of Soviet road building machinery. However, Rwanda insisted that any aid extended must be in the form of grants. According to a report the Soviet délegation agreed to discuss Rwanda's position on its return to Moscow but do not believe that the Soviet Government will accede to its request. (CONFIDENTIAL)

Morocco

16. Discussions concerning the Soviet Union's cooperation and aid for the construction of a dam in the province of Ouarzazate have been taking place in Rabat. The negotiations, which also included talks on technical training for Moroccans in the Soviet Union, follow an earlier agreement between the two countries for Soviet aid in the construction of an iron works near Casablanca. A Soviet economic mission visited Morocco early in 1966 and made a survey of projects which the Soviet Union might be prepared to finance. The dam and the iron works are probably two of the projects approved by the Soviet Union. King Hassan reportedly intends to visit Moscow in October, 1966 to discuss the expansion of Moroccan-Soviet relations and it is believed that a Soviet credit to Morocco may be formalized at that time.

17. Up to the present time communist aid to Morocco has been limited to a small Soviet military aid programme, which was terminated by Morocco in 1965, and two economic credits with a total value of $13 million from Poland for a sugar refinery and the import of machinery.

18. Morocco has encountered financial difficulties completing its current development plan and may feel it necessary, for political reasons, to seek assistance from the communist countries as well as the West. (CONFIDENTIAL)

MIDDLE EAST

Turkey

19. Following a recent visit to Turkey the Soviet Minister of Foreign Trade announced that there were possibilities for increasing trade between the two countries and reported that Turkey had expressed the wish to import an additional $4 million worth of machinery and equipment, thus increasing the volume of Soviet-Turkish trade in the period April 1966-March 1967 to $80 million.

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The trade minister also announced there were good prospects for cooperation with Turkey in the development of Turkey's aluminum industry and that the Soviet Union was prepared to supply all the necessary mining equipment.

20. According to a report the Turkish government is satisfied with the Soviet designs for seven industrial projects which the Soviet Union has agreed to provide under a $200 million loan extended to Turkey late in 1966. Discussions are now under way concerning the final cost of these projects. (RESTRICTED)

Greece

21. The Soviet Union and Greece have reached an agreement over the purchase by Greece of a thermal generator, with a capacity of 200 megawatts, from Technopromexport. Negotiations concerning this purchase have been underway since April 1966 when the Greek government approved the purchase of the generator for $15.5 million. Both sides agreed that 80 per cent of the cost of the generator would be repaid through exports of Greek tobacco, and the remaining 20 per cent in foreign exchange and drachmas. A stalemate was reached early in the negotiations when the Soviet Union insisted a gold clause should be included in the agreement and that it should have the right to purchase the tobacco from private merchants instead of from Greek government stocks. Apparently the situation has now been resolved in Greece's favour and the tobacco is to be purchased from stocks held by the state. (RESTRICTED)

22. No government-to-government credits have been extended to Greece by the communist countries, although offers have been received from some of the communist countries to provide financial and technical aid for the construction of industrial installations in exchange for tobacco. In 1965, a private Greek shipowner concluded two agreements to purchase thirty-three ships from the Soviet Union at a cost of $84 million. The first agreement, concluded in July, called for full payment in foreign currency while the second agreement, concluded in December, required a 20 per cent downpayment on all deliveries and the balance to be repaid over eight years with 40 per cent of the payment to be made in Greek commodities and the balance in foreign exchange.

Yemen

23. The Soviet Union has agreed to supply Yemen with the necessary quantity of oil and other products it formerly received from other sources via Aden. The first Soviet ships with crude oil, foodstuffs and other products have already arrived at Hodeida. (UNCLASSIFIED)

24. Communist China reportedly has agreed to supply 6,000 tons of wheat to Yemen by the end of October and to accept token repayment in Yemeni currency. The wheat is valued at about $400,000 at prevailing prices and will likely be distributed for resale within Republican-controlled Yemen. (CONFIDENTIAL)

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ASIA

Pakistan

25. Early in September the Soviet Union and Pakistan concluded a new economic aid agreement under which the Soviet Union is reported to have agreed to extend a new development credit reportedly valued at $84 million for Pakistan's third five year plan (1965-1970). According to a statement by Pakistan's Deputy Minister of Planning seven projects, including two heavy electrical machinery complexes, are covered by the new agreement. Repayment terms provide for twenty-five percent of the total credit to be repaid in twelve years at 2.5 percent and the remaining seventy-five percent over ten years at the same interest rate. Previous Soviet aid to Pakistan is valued at about $90 million. (RESTRICTED)

26. It is reported that Pakistan will soon purchase about $10 million worth of textile machinery and equipment for manufacturing such machinery from the Soviet Union. These imports are being made under a previous Soviet credit extended to Pakistan for the establishment of small industrial enterprises. (UNCLASSIFIED)

Malaya

27. According to reports from Kuala Lumpur the Soviet Union has promised that it will continue to be Malaya's top customer for rubber in 1966. Last year Malaya exported about 200,000 tons of rubber to the Soviet Union. (UNCLASSIFIED)

India

28. India has received an economic credit valued at $15 million from Bulgaria. According to an India report the credit will be used to finance the import of complete plants and industrial equipment in 1966-67. (RESTRICTED)

PART II - MILITARY AID

Trends in Communist Military Aid in the Third Quarter of 1966

29. In the Middle East, over 300 Greek Cypriots who had been in the UAR training on the SA-2 surface-to-air missile returned home. As there is no evidence that missiles have been moved to the island from the UAR or that preparations are under way to establish sites, it seems that the Cypriot government has decided at least to postpone still further the delivery of these weapons. (SECRET)

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30. Pakistan has continued to receive substantial quantities of Chinese equipment. Material received so far includes at least 150 and perhaps as many as 300 medium tanks and probably 80 to 85 MIG-19/FARMER jet fighters and more of these items are to come; nine to twelve IL/28/BEAGLE light bombers and large amounts of artillery and infantry weapons have also arrived. Pakistan had talks with the Soviet Union during the period on the possible purchase of arms from that country but no deal has yet resulted. (SECRET)

31. India continues to be one of the major recipients of Soviet military equipment, and also receives significant quantities from Czechoslovakia. Large numbers of tanks are being procured from both countries, as well as artillery and aircraft from the USSR. The MIG-21 assembly plant, built with Soviet aid, has been completed and assembly of aircraft is said to have begun. It is reported that two Indian submarine crews are training in Vladivostok (India is expected to receive four possible F-class submarines from the USSR). (SECRET)

32. Deliveries of Soviet military material to Indonesia seem to be at a standstill though small shipments of spares are probably still being made. Certainly no major deliveries are known to have occurred. Attempts by the new regime to put Indonesia's economic house in order may in part account for the apparent cessation of these deliveries. In this context, the outcome of foreign minister Malik's forthcoming talks in the USSR on the rescheduling of the country's heavy debt to the Soviet Union, most of which is for military aid, may have a bearing on future deliveries. It seems probable, however, that at least some equipment will continue to be provided by the Soviet Union. The Indonesians for their part, even if they should cut back on weapons procurement, will continue to require a continuing flow of spares from the USSR. (SECRET)

MIDDLE EAST

Cyprus

Return of Missile Trainees from UAR

33. At last report all but about 40 of the 349 Greek Cypriots known to have gone to the UAR since late 1965 for training on the SA-2 surface-to-air missile have now returned to Cyprus. There is no evidence that any of the missiles believed stored in the UAR for Cyprus have moved to the island nor of preparations within Cyprus to deploy them. (SECRET)

34. There were reports earlier this year that the missiles would be sent to Cyprus and sites established this past summer. It seems that the Cypriot government has decided to postpone still further the establishment of SA-2 sites or might even have decided not to proceed with the acquisition of these weapons. (SECRET)

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FEDERATION OF SOUTH ARABIA

Chinese Aid to Federation for Liberation of South Yemen (FLOSY)

35. A British report states that FLOSY leaders in Cairo claim to have received aid worth one million pounds sterling from China, with half reported to be in sterling currency and the remainder in "munitions". According to the report Chinese arms have recently been discovered in the Federation. (SECRET)

ASIA

INDONESIA

Postponement of Malik's Visit to USSR

36. Indonesian foreign minister Malik, who was to have visited the USSR in September, had his visit postponed at the last minute by the Russians on the grounds that Soviet leaders would be busy with "long standing arrangements" during the time proposed by the Indonesians. Malik was also to visit Poland and Czechoslovakia and these visits have also been postponed. The Russians have however invited him to visit the USSR in mid-October. Malik himself had on at least three occasions rescheduled his visit to the Soviet Union, presumably because of Indonesian domestic developments. (SECRET)

AFRICA

ALGERIA

Further Arms Deliveries

37. Two more arms shipments from the Soviet Union arrived in Algeria during September, bringing the total for the year to at least 16. The cargo vessel METALLURG BAYKOV arrived at Algiers on 10 September from the USSR via Latakia, Syria and is reported to have unloaded a cargo of military equipment including one MIG-17/FRESCO jet fighter, 10 crates believed to contain aviation-associated equipment, 22 ATS-59 medium tracked artillery tractors, four JSU-152 self-propelled guns (the first of these weapons to be sent to a non-Communist country), five GAZ-63 trucks, one KS-19 100 mm AA gun, three BTR-152 armoured personnel carriers, communications equipment, ammunition, assorted boxes and crates and a number of cylindrical objects possibly containing SA-2 surface-to-air missiles. At the end of the month the Soviet vessel FIZIK LEBEDEV made its third delivery of military equipment to Algeria in the past two months. Equipment delivered included trucks and trailers, one KS-19 100 mm anti-aircraft gun, 10 medium artillery tractors, four grey cylindrical containers (like the ones above possibly containing SA-2's), ammunition and assorted boxes and crates. (SECRET)

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Arms Receipts Under May 1965 Agreement

38. All of the arms deliveries to Algeria in 1966 are believed to have been made under the May, 1965 military aid agreement with the Soviet Union and it may be that the current programme is now nearing its end. Under the agreement Algeria has received a wide range of more modern and heavier field and anti-aircraft artillery, a substantial increase in the number of armoured personnel carriers, medium tanks and self-propelled guns and a corresponding increase in support equipment, including vehicles and ammunition. Items of equipment associated with the SA-2/GUIDELINE surface-to-air missile including communications and guidance radar equipment have also been received. Only two missiles have actually been seen so far and these may be only training or display missiles. The capability of the Algerian air force has also been increased with the acquisition of 20 additional MIG-21/FISHBED supersonic jet fighters, six additional IL-28/BEAGLE light jet bombers and 18 more MIG-17/FRESCO's. The Algerian navy has received three SO-1 coastal escort vessels and may be receiving KOMAR missile equipped patrol boats and a minesweeper under the 1965 agreement. (SECRET)

CONGO (BRAZZAVILLE)

Cuban Military Aid

39. Cuba has supplanted other countries in the provision of military training for Congo (Brazzaville) and, according to a British report, it appears likely that a formal military aid agreement was concluded between the two countries following the abortive military coup in June, 1966. The number of Cuban personnel in the country has not been verified but it may be as high as 300. A number of Brazzaville Congolese have been trained in Cuba and more are scheduled to go to Cuba in 1967. Cuba has also provided some military equipment but details are unknown. (SECRET)

PORTUGUESE AFRICA

Cuban Military Aid to Dissidents

40. A Cuban ship is believed to have delivered a quantity of arms to Conakry for the use of Portuguese Guinea rebels now undergoing training in Guinea. One unconfirmed report put the total at 3,000 tons of weapons, ammunition, clothing and other military equipment. A Cuban ship is reported to have delivered 20 ZIL trucks to Conakry in June, 1966. These vehicles may also be for dissident forces from other countries receiving training in Guinea. (SECRET)

Other Communist Military Aid

41. Soviet weapons captured from rebel forces in the Portuguese colonies and recently exhibited in Lisbon have included three mortars, eight antitank guns, 75 submachine guns, 26 light machine guns, hand grenades and mines. Some of the equipment was identified as of Chinese origin including nine mortars and 27 submachine guns. The origin of some of the equipment could not be identified but certain items, especially 62 Thompson sub-machine guns, may have been supplied by Cuba. (RESTRICTED)

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SOMALIA

Possible Chinese Military Aid

42. A US report states that according to reliable sources 60 Chinese military tank trucks were secretly unloaded at Mogadiscio during the past few weeks and were taken to unknown destinations. This is the first evidence of possible China military aid to Somalia. A Somalian parliamentary delegation visited Peking in September, 1966 and reportedly accepted a Chinese offer of aid at that time but this of course would be too late to cover the above shipment of trucks. (SECRET)

TANZANIA

Chinese Military Personnel

43. According to a reliable source in Dar-es-Salaam there are no Chinese advisers actually attached to the Tanzanian Peoples Defence Force. However, there is a team of eight Chinese instructors training reserves in the Southern Region. In addition there is a small group of Chinese armourers numbering between eight and twelve in Dar-es-Salaam helping to service Chinese small arms. The number of Chinese military personnel working with various groups of "freedom fighters", to whom Tanzania provides shelter, is unknown. (SECRET)

Possible Arms Shipment on Yugoslav Ship

42. A Yugoslav ship docked at Dar-es-Salaam in August, 1966 with a cargo described as explosives and at first the Tanzanian defence department professed ignorance of the ship and its cargo. It was eventually unloaded under security precautions. The cargo reportedly consisted on 21 tons of crates of three sizes which gave the impression of holding ammunition, rifles and machine guns. The cargo was taken away in Tanzanian Peoples Defence Force vehicles. (SECRET CANUKUS)

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TABLE I

Communist Economic Aid Extensions

1 January - 30 September 1966

(Million US$)

Extended By	Recipient	Value
Soviet Union	Iran	290.0
	Pakistan	20.0
	Syria	148.0
	Cameroun	7.7
	Burma	14.0
	Somalia	4.2
	India	630.0
		1,113.9
Czechoslovakia	Pakistan	28.0
Hungary	India	52.5
	Syria	14.0
		66.5
Bulgaria	Syria	15.0
	India	15.0
		30.0
Communist China	Tanzania	8.5
	Cambodia	42.9
		51.4
	TOTAL	$1,289.8*million

* Note: The value of communist economic aid to the less developed countries in the period 1 January - 30 September 1966 has been revised downward since a reported Soviet loan for $165 to the UAR in 1966 has not been confirmed, and an adjustment of $33 million in the value of a Soviet loan to Turkey in 1965 has been cancelled.

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DATE 15 November 1966

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Ottawa

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October 1966

(Unevaluated Information)

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October 1966

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EVALUATIONS

A. Completely reliable	1. Confirmed from other sources
B. Usually reliable	2. Probably true
C. Fairly reliable	3. Possibly true
D. Not usually reliable	4. Doubtful
E. Not reliable	5. Probably false
F. Reliability cannot be judged	6. Truth cannot be judged

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SECRET
JIB(CAN) 28/66

I. CZECHOSLOVAKIA

SERIAL NUMBERS - SCUD
Parade, 25 September 1966

1. The military parade at Ceske Budejovice on 25 September 1966, at the end of the Warsaw Pact VLTAVA manoeuvres, included six Czech SCUDs. The serial number on one of them was noted as 5684.

Evaluation:	B-2
Report & Date:	40/66 of 25 Sept 66
Source:	CFA/Prague

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SECRET
JIB(CAN) 28/66

II. CZECHOSLOVAKIA

TOPOGRAPHICAL INTELLIGENCE
Prague Area tour, 13 Oct 66

The Canadian Air and Military Attaches accompanied the British Air Attache on a tour through PRAGUE-BENESOV-VLASIM-HUMPOLEC-JIHLAVA-JINDRICHUVE-HRADEC-LOMNICE-CESKE BUDEJOVICE-BECHYNE-TABOR-PRAGUE, on 13 October 1966. A complete report has been made and circulated to interested persons (see British report AA/196/66 of 15 October 1966).

001210

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CONFIDENTIAL
JIB(CAN) 28/66

III. PAKISTAN

ARMAMENTS
CHICOM Weapons 4-15 Oct 66

1. The only BLOC weapons seen during a tour of Pakistan 4-15 Oct 66 was at Quetta where approximately one platoon of troops were seen carrying rifles which it is believed are Soviet 7.62mm Assault Rifles (AK-47). The rifles were slung, the magazines were not attached and the rifles had the wooden butt.

2. Although the troops were not wearing distinguishing flashes it is believed they were from 16 Division, Quetta. As similar rifles were also seen at Peshawar when 9 Division was stationed there it is possible that both these divisions are equipped with BLOC small arms.

Date & Report: 20 Oct 66
55/66
Source: CFA/Pakistan

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JIB(CAN) 28/66

IV. POLAND

TOPOGRAPHICAL INTELLIGENCE
Warsaw Area Tour, 17 Oct 66

1. The Canadian Forces Attache accompanied the UK Defence Attache on a tour through WARSAW-KARCZEW-SOBIENIE JEZIORY-OSIECK-PILAWA-CRECHY-PARYSOW-STOCZEK LUKOWSKI-SEROCZYN-LATOWICZ-MINSK MAZ-WARSAW on 17 Oct 1966.

2. A report has been published and circulated to interested persons (see UK report MA/230/18 of 18 October 1966).

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V. U.S.S.R.

AIRCRAFT - Industry
Kazan, 13/15 Sept 66

1. The Canadian Air and Military attaches were in KAZAN 13-15 September 1966.

KAZAN/North Airfield (TFP 82/63)

2. On let-down, the plane broke through overcast into scattered bottom cloud at between 150 and 300 feet. They caught several glimpses of what must have been this serial about 2 miles on port side. However, they observed only one runway (NW/SE). Only aircraft seen were 9 possible CRATES (white) at SE end of parking apron. Approach continued straight-in to land to SE on Kazan/Civil a minute or two later. (At 1230 hrs 14 Sept they observed from causeway near Monument, a CRATE landing from E in vicinity of Kazan/North airfield).

Air Activity over Kazan

3. Flights over the city were frequent throughout the period. Most prevalent were COLTs; next, CABs and CRATEs; other types observed were COOT, CAMEL/COOKPOT, CAT/CUB. No helicopters, warplanes, or other exotic craft were seen.

Report & Date: IR M-93/66
IR A-99/66 dated 21 Sep 66
Source: CMA&AA/Moscow

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SECRET
JIB(CAN) 28/66

VI. U.S.S.R.

TOPOGRAPHICAL INTELLIGENCE
Visit to Kazan, 13-15 Sept 1966

1. The Canadian Air and Military Attaches flew to Kazan on 13 September and returned 15 September, 1966.

KAZAN OBSERVATIONS

JIB Serial (TFP 82/63)	Observations
57	Travellers walked NORTH-WEST across the levee and bridge into Kirovsky Rayon. There are in fact two bridges. The road bridge is a three-span reinforced concrete arch bridge on concrete piers. It carries two tram lines in the centre and two lanes of vehicular traffic each side. It is approximately 480 feet long and the clearance at the centre span at present water level is estimated to be 25 feet. At high water this is reduced to perhaps 15 feet. The Railway bridge is a 3-span steel bridge on concrete piers. It is single tracked. The end spans, estimated 80 feet, are plate girders with estimated 4-foot web. The number could not be determined. The centre span is a steel truss (Warren girder type) approximately 200 ft long. The clearance is the same as for the road bridge.
49	At Klari Tsetkina 8 is Zavod Seri i Molot. It is listed "Upravlenia Obshestvo Mashinostroyenia Sredniye Volzhskovo Sovnarkoza".
50	At Klari Tsetkina 18 is Zavod Santskpribor.
45 45(a)	Travellers were able to walk the EASTERN boundary of a large industrial complex at the end of Tsetkina. At the SOUTHERN end of the installation is a complex with a decided military appearance. A number of SAM junior officers and NCOs were seen in the vicinity. Heavy foliage and a twelve-foot fence prevented effective observation. This complex

/is separated

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U.S.S.R.

JIB Serial
(TFP 82/63)

Observations

is separated by a new 12-ft wooden fence from the adjoining complex which extends a further, approximately, 1200 ft. Again, the 12-ft fence and foliage thwarted observation. At the NORTHERN end is a grey brick building some 40 ft high and approximately 300-ft long. As all other buildings seen are of red brick construction this is presumed to be a recent addition. The height of the windows, which is about two thirds the height of the building, suggest that it is a one-storey open building. No unusual sounds were heard and no equipment seen.

Travellers were diverted by a dead end at the top of Serial 4.

Travellers noted that the shoreline of the EASTERN end of the basin lying NORTH of the levee and the two bridges (JIB Serial 57) near the monument was stained a bright blue. The water in the basin showed no such tint.

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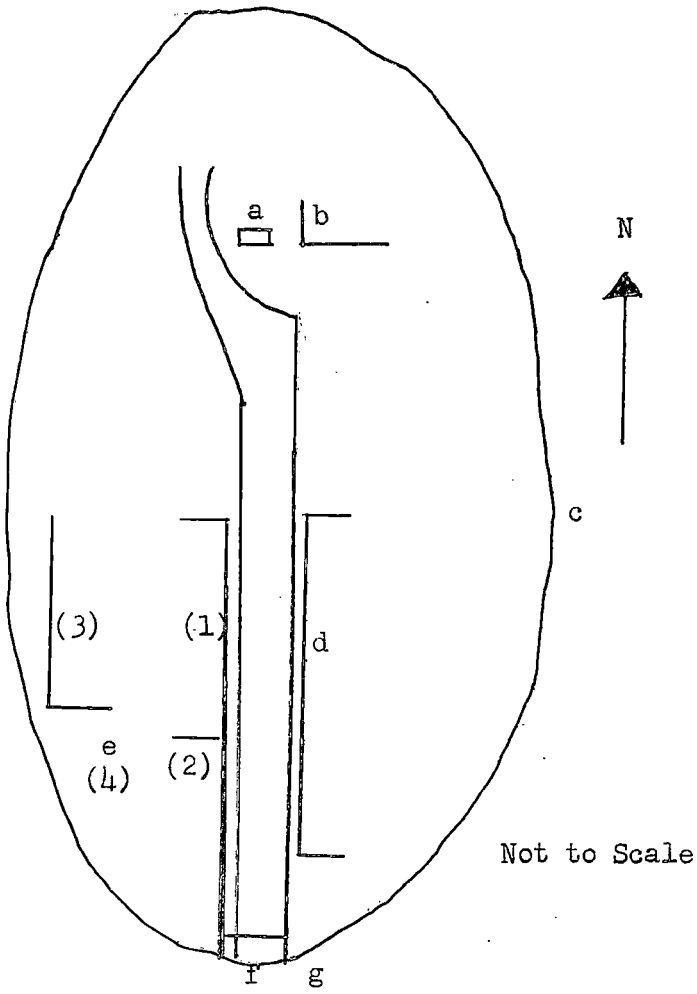
U.S.S.R.

JIB Serial
(TFP 82/63)

60

Observations

Kremlin. Travellers were denied access to the area of the building housing the Supreme Soviet and Council of Ministers and also to the road leading around outside the walls to the EAST at the entrance. The layout is roughly thus:



(a) Syuyumbeka Tower.

(b) Supreme Soviet and Council of Ministers.

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U.S.S.R.

JIB Serial
(TFP 82/63)

Observations

(c) Travellers were denied a view of this area.

(d) A long grey masonry building housing several ministries.

(e) Military Compound protected by a 10-12 ft fence which extends to the end of a 4-storey masonry building (1). Nothing could be seen through the closed gate (2). One unidentified officer was seen through a second storey window of the building (1) and a colonel arty/blk and a major Tk/blk, and four U/I NCOs/Ptes were seen in the vicinity. Cargo vehicles oo-- ГЦ and 02-- Гω were seen near the gate. No antennae were visible other than a horizontal, double-wire antenna which extended from the roof of building (1) to the ministry building across the street. Building (3) is probably a barracks. It can only be seen from the street below. There are low buildings in area (4). Details and occupancy could not be observed.

(f) Spasskaya Tower over entrance.

(g) Travellers were denied access.

74
(green)

On the roof of the building housing the museum and a DOSAAF naval club at Lenina 2 were observed a KNIFEREST and a FISHNET. On a neighboring building of unknown tenancy were 2 MERCURY GRASS.

72

The Garrison Commandant is at Dzerzhinskovo 17.

101

The university occupies the whole block bounded by Lenina - Universititskaya - Astronomicheskaya - Profsoyuza. No security measures and no military activity were observed in this area.

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U.S.S.R.

JIB Serial (TFP 82/63)	Observations
115	At Sverdlova 50 is an industrial plant which fronts about 400 ft on this street and extends the depth of the block. A sign at the entrance indicated that electricians were required at the plant. No other indicators as to function were observed.
	At Sverdlova 52 is the Tartar Republic Voenkomat. No recruiting activity was observed. The SOUTH-EAST end of the building houses a military commissariat.
4	Travellers took a No 9 tram NORTH into Leninsky Rayon, disembarked at the first stop NORTH of the railway underpass and walked NORTHEAST along the EASTERN boundary of the park. First an 8 - to 10-foot wooden fence, then a masonry wall, both separated from the sidewalk by trees and brush, greatly hampered observation. Traveller's movements were unimpeded until they were stopped by two armbanded gentlemen at a point level with the EASTERN tip of the park. A third Russian joined the group and took charge. Travellers were told that the entire region was closed, were marched politely back to a trolley-bus stop and soon put on a N-bound bus which looped back to the city. At the bus stop one of several slightly weather beaten signs read: "Novi Zavot Budet". As these words captioned a picture of several workmen carrying planks on a stretch of barren ground, the poster may well have been for local propaganda purposes only, rather than being a forecast of a new plant at that location.
	Throughout the period that the travellers were in the vicinity (from 1005 - 1030 hrs 15 Sep) no engine noises were heard, no interesting transport was observed, and no military were seen until travellers were exiting the area by trolley bus. At this time a ragged squad of 20 soldiers carrying rifles was seen walking northward into the region.

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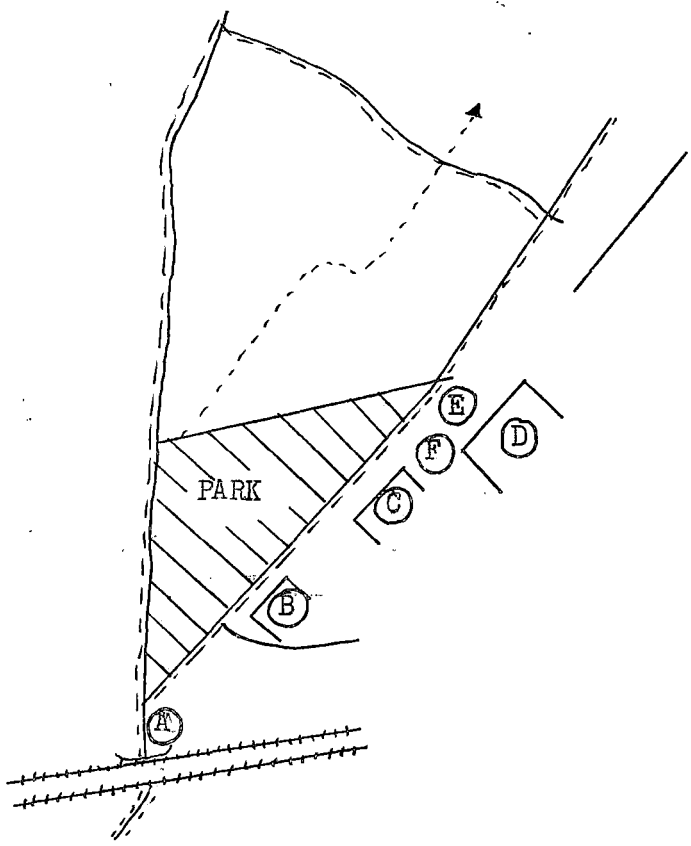
Document divulgué en vertu de la Loi sur l'accès à l'information

U.S.S.R.

JIB Serial
(TFP 82/63)

Observations

The following sketch shows the route travelled and the few observations made:



A - 20 man rifle squad
B - red-brick building u/c; 2 storey; 150' long.
C - grey-brick building; 2 storeys high; 275' long; end view

D - large grey brick building; clean and looks quite new
E - travellers stopped by security men
F - trolley bus stop
--------No. 9 tram
_ _ _ _ Approx trolley bus route.

Document disclosed under the Access to Information Act
Document divulgué en vertu de la Loi sur l'accès à l'information

U.S.S.R.

JIB Serial (TFP 82/63)	Observations
20	Immediately NORTH of the railway and 2-3 km WEST of the underpass (JIB Serials 4-10 above) are two thermal power plants. One of apparently recent construction has one tall stack and three cooling towers. The older looking plant has two shorter stacks and two cooling towers with the empty framework of a third. It could not be observed whether this was a new tower under construction or an old one being dismantled. All five towers were steaming when observed.
117	Seen from a taxi on the EAST side of Tartarskaya immediately SOUTH of the water course (Blizhniy Kaban) a red brick building with the appearance of a power plant. It appears to have been converted to other use. On the roof were seen two MERCURY GRASS and two or three pole antennas.
122	River Port Now boasts a large new passenger terminal with berths for passenger craft, immediately in front. Eleven portal cranes were counted at the freight terminal which at the time appeared to be given over completely to coal. A MERCURY GRASS is mounted on the roof of a small building just S of the passenger terminal.
46	A KNIFEREST was observed in the SOUTH-EASTERN portion of this serial. No impression was gained of type of activity within the serial.
31	No tall tower was observed in this location.
37	No lattice towers were observed in this location. There is, however, a single mast, guyed at three points, which is estimated to be at least 300' high.
84	This appears to be a civilian hospital. No military vehicles or personnel were observed in the vicinity and a sign on the gate read "Bolnitsa", not "Gospital".

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(Visit to Kazan
13-15 Sept 1966 Cont'd)

SECRET
JIB(CAN) 28/66

U.S.S.R.

JIB Serial
(TFP 82/63)

Observations

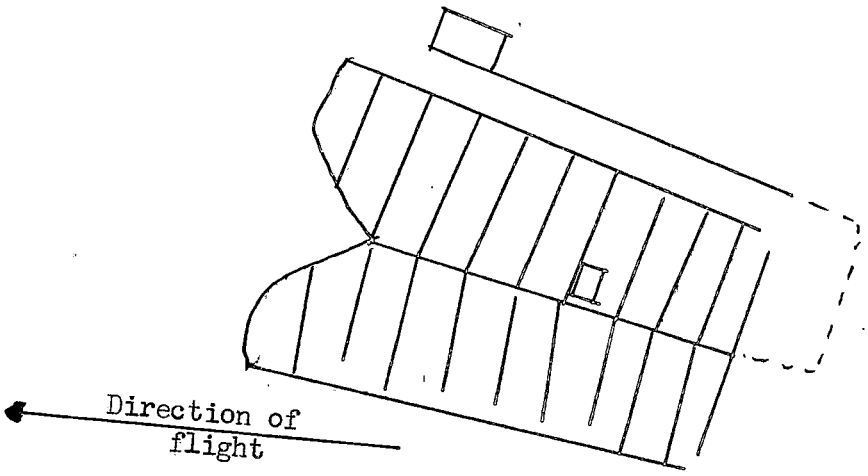
FLIGHT - MOSCOW TO KAZAN 13 Sept

Took off from Vnukovo 1600 hrs on runway 24. Circled to right climbing and entered overcast at a few hundred feet without having glimpsed anything of interest. Flew over nine-to ten-tenths overcast until over Kazan on let-down.

FLIGHT - KAZAN TO SHEREMATYEVO, 15 Sept

(a) They took off to the NW from Kazan/Civil at 1811 hrs in moderate rain under solid overcast. Obtained brief glimpse of airfield to starboard (same one reported at item) but could make out no details. The undercast gradually cleared as the flight progressed but the light got progressively poorer.

(b) SA 1 Sites. At 1908 hrs passed just S of one SA 1 site (probably E 10a-1) configured roughly as shown below. No activity was seen but the ribs stood out quite clearly and there were several lights in the support area.



SECRET

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(Visit to Kazan 13-15 Sept 66 Cont'd)

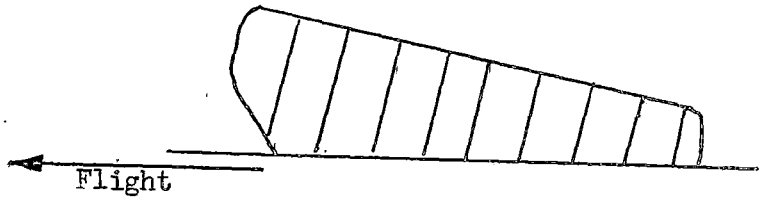
SECRET
JIB(CAN) 28/66

U.S.S.R.

JIB Serial
(TFP 82/63)

Observations

Four minutes later (at 1912 hrs) passed almost directly over a second SA 1 site, which appeared outboard of the starboard nacelle as shown below



(c) Moscow/Monino and Shchelkovo Airfields

Flight passed just south of these two airfields. Five medium sized swept wing aircraft were parked on the ladder tarmac in the NE corner of Monino field.

Report & Date: IR M-93/66
IR A-99/66 dated 21 Sep 66
Source: CMA&AA/Moscow

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Document divulgué en vertu de la Loi sur l'accès à l'information

APPENDIX A

LISTINGS FROM KAZAN TELEPHONE DIRECTORY

1. The following were extracted from the Telephone Directory in the travellers' suite.

Factories:

Asphalto-betonni Zavod
Dorozhno-Stroitilnovo Upravlenia Kasgorispolkoma
Pobed yeva 18

Zavod Gazoapparat
Sredniye - Volzhskevo Sovnarkoza
Kompressornaya

Zavod GARO
Narimanova 40

Zavod Zhelleznobetonnik Izdeli Tresta 2
G Sadova 2A

Zavod Zheloznobetonnik Izdeli No 3 Tresta
"Prometroymateriali"
Gorkovskoye Shosse

Zavod "Iskozh"
Upravlenia Lekoi i Tekstilnoy Promishlenosti
Sredniye - Volzhskovo Sovnarkosa
Kazan 26

Kazhevenno-mekavoi Zavod Krasnoye - Znamya
Naherezhnoye 23

Zavod Pervichnoi Obratoki Kazsirya Upravlenia
Lakoi i Teckstilnoi Promishlenosti Sredniye
Volzkskovo Sovnarkoza
Arkangelskaya 14

Lakokrasachny Zavod
Yamasheva 72

Zavod Meditsinskoi Apparaturi
Sredniye - Volzhakovo Sovnarkosa
Naherezhnoya 11

Medico-instrumentalni Zavod
S Sayidasheva 12

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(Kazan Telephone Directory)

Kazankoye Melzavodoupravleniye
Promishlenosti Prodtovarov TASSR
Pavlikina 44

Zavod Metallozdolyi ? Upravlania
Selkozmashinoastroiniya i Padshipnikovoi
Promishlenosti Sredniye - Volzhskovo
Sverdlova 26

Galvanichiski Tsek
Pl Kommuni 3

Zhestyanoi Uchastok
Grajdanskaya 2

Otdelonio Zhestyanovo Uchastka
Ostrovskovo 33

Otdeleniye Galvenicheskovo Uchastka
Kirovo 51

Kravatnyi Uchastok
Chernishevskovo 38

Molyamoye ? Otdeleniye
Krovatnovo Uchastka
Pl Kommuni 3

Mechanichiski Zavod
Upravlenia Podshipnikovi Promishlenosti
Sredniye - Volzhskovo Sovnarkoza
Pavlikina 75

Filial No 1
Spartakovskaya 7

Filial No 2
Frezernaya Tsek No 3

Mechanichiski Zavod
L Bulatchnaya 38

Zavod Orgsentesa Noiftekimecheskoi
Promishlenosti Sredniye - Volzhskovo
Sovnarkoza
Kazan 51, Ul Byelomorskaya

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(Kazan Tele phone Directory)

SECRET
JIB(CAN)28/66

Zavod Rosenovek Techineskik Izdeli
Kimicheskovo Upravlenia
Sredniye - Volzhekovo Sovnarkoza
Lebeleva 5

Vinyi Zavod "Somstresta"
Gruzenskovo Sovnarkoza
Baumana 42

Silikatni Zavod
Sradniye - Volzhekovo Sovnarkoza
Kazan 36
Tetzocskaya

Zavod Stroyeditalii No 1 Tresta
"Promstroyimateriali"
Posyelck Vorovskovo

Fotogelatenovi Zavod No 9
Sredniye - Volzhskovo Sovnarkoza
Sl Vesstandya

Chim Zavod Im Kuybysheva
Upravelenai Chimicheskoi Promishlenosti
Sredniyo - Volzhskovo Sovnarkoza
Kazan 35

Chimiko Pharmatsevticheskyi Zavod
Upravlenia Chemicheskoi Promishlenosti
Srodniye - Volzhskovo Sovnarikozo
Astronomicheskaya 15

Filial Zavoda
Korotchinsko 15

Experimentalno - Proizvod VKF
(VTSIKI) Lososplava
Tolstovo 39

Zavod Electrokonstruktayi Tresta
"Electromontazhkonstruktziya" Glavel - electromontazha
Jurnalistov 19

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(Kazan Telephone Directory)

Miscellaneous

Tartar Republic Voenkomat
Sverdlova 52

(Each Rayon has its own Voenkomat)

City Committee DOSAAF
Bolshaya Krasnaya 33

(each Rayon has its own)

Civil Defence Staff TASSR
Dzerzhinskovo 19

Aviatsionni Institut (KAY)
Tolstova 15, K Marksa 10

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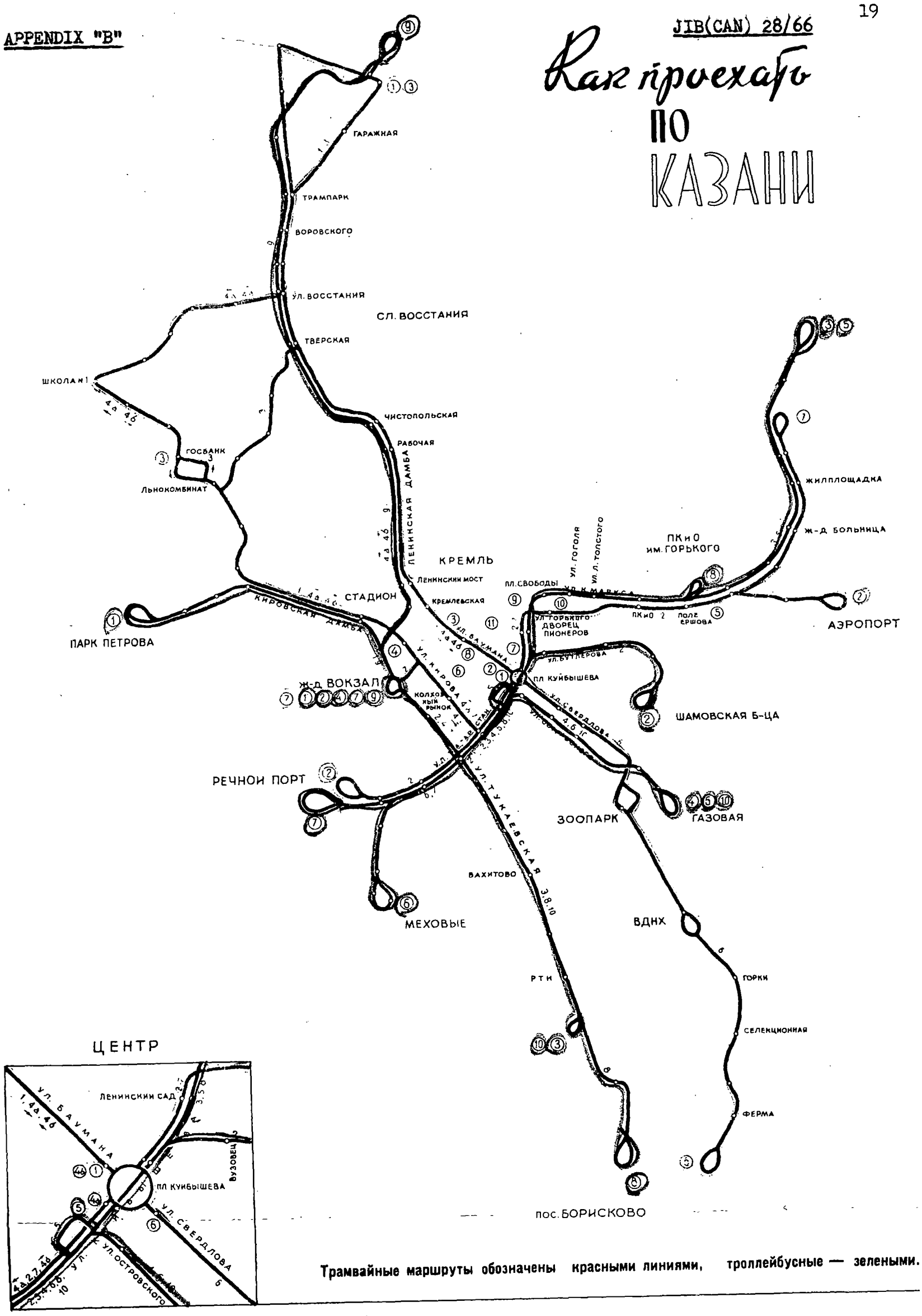
APPENDIX "B"

JIB(CAN) 28/66

Как проехать по Казани



Трамвайные маршруты обозначены красными линиями, троллейбусные — зелеными.

ЧЕРНЫМИ ЦИФРАМИ ОБОЗНАЧЕНЫ:

1. Гостиница «Татарстан».
2. Гостиница «Совет».
3. Гостиница «Казань».
4. Гостиница «Волга» (строится).
5. Гостиница «Заря».
6. Кассы предварительной продажи билетов на все виды транспорт:
7. Междугородный телефон.
8. Большой драматический театр им. В. И. Качалова.
9. Театр оперы и балета им. М. Джалиля.
10. Татарский академический театр им. Г. Камала.
11. Главпочтамт.

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SECRET
JIB(CAN) 28/66

VII. U.S.S.R.

TOPOGRAPHICAL INTELLIGENCE
Moscow-Shosha Road trip
3-5 September 1966

1. The Canadian Military and Air Attaches spent the weekend of 3-5 September 1966 at the diplomatic dacha at Shosha, travelling by car. The trip was registered with OVS.

OBSERVATIONS ENROUTE MOSCOW-SHOSHA AND RETURN, 3 and 5 SEPTEMBER, 1966

2. The following observations were made enroute Moscow-Shosha and return. Kilometer readings show distance from Moscow on the Moscow-Leningrad highway.

KM	OBSERVATION
Moscow	Radar Site 1021 3 Sep - BARLOCK on right-hand mound. 5 Sep - SIDENET plus BARLOCK (believe without end-box) No equipment working
29, R	Radar Site 1048 - 2 BL with end-box. One working on 5 Sep in light evening fog
29	New Road - fair amount of activity; construction progressing.
38, L	Six new high white apartment buildings and low red brick buildings seen through trees. Several cranes were in the area.
41	Convoy of 4 GAZ69 and 2 Comm vans bearing VRNs 16 xx B4 heading towards Moscow.
41, L	Unidentified Plant ("Apartment Blocks"). Work progressing.
47.5, L	Vesna oriented roughly N-S. Round dish about half-way up.
73, L	Probable HOUND flying W low. (3 Sep)
76	Helicopter flew W-E. (3 Sep)
85, R	Site E33 - The three domes, three cranes, and two lattice towers were seen. On 5 Sep, HOUND seen flying N slightly N of site.

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Document divulgué en vertu de la Loi sur l'accès à l'information

(Moscow-Shosha Road trip continued)

KM	OBSERVATIONS
90, R	Klin Airfield - The following aircraft counts were made: 3 Sep - 4 CRATE, 10 CAMP/CUB, 1 CAMEL 5 Sep - 5 CRATE, 12 CAMP/CUB, 3 CAMEL In addition, on 3 September a CAMEL was seen on approach and a CRATE crossed the highway E-W a few kilometers N of the airfield.
109.7	The Hoof-and-Mouth post previously at this point has disappeared. Some sawdust remains at the side of the road; the pit itself has been filled in but not surfaced.

Report & Date: A-95/66
6 September 1966

Source: CAA/Moscow

Document disclosed under the Access to Information Act
Document divulgué en vertu de la Loi sur l'accès à l'information

SECRET
JIB(CAN) 28/66

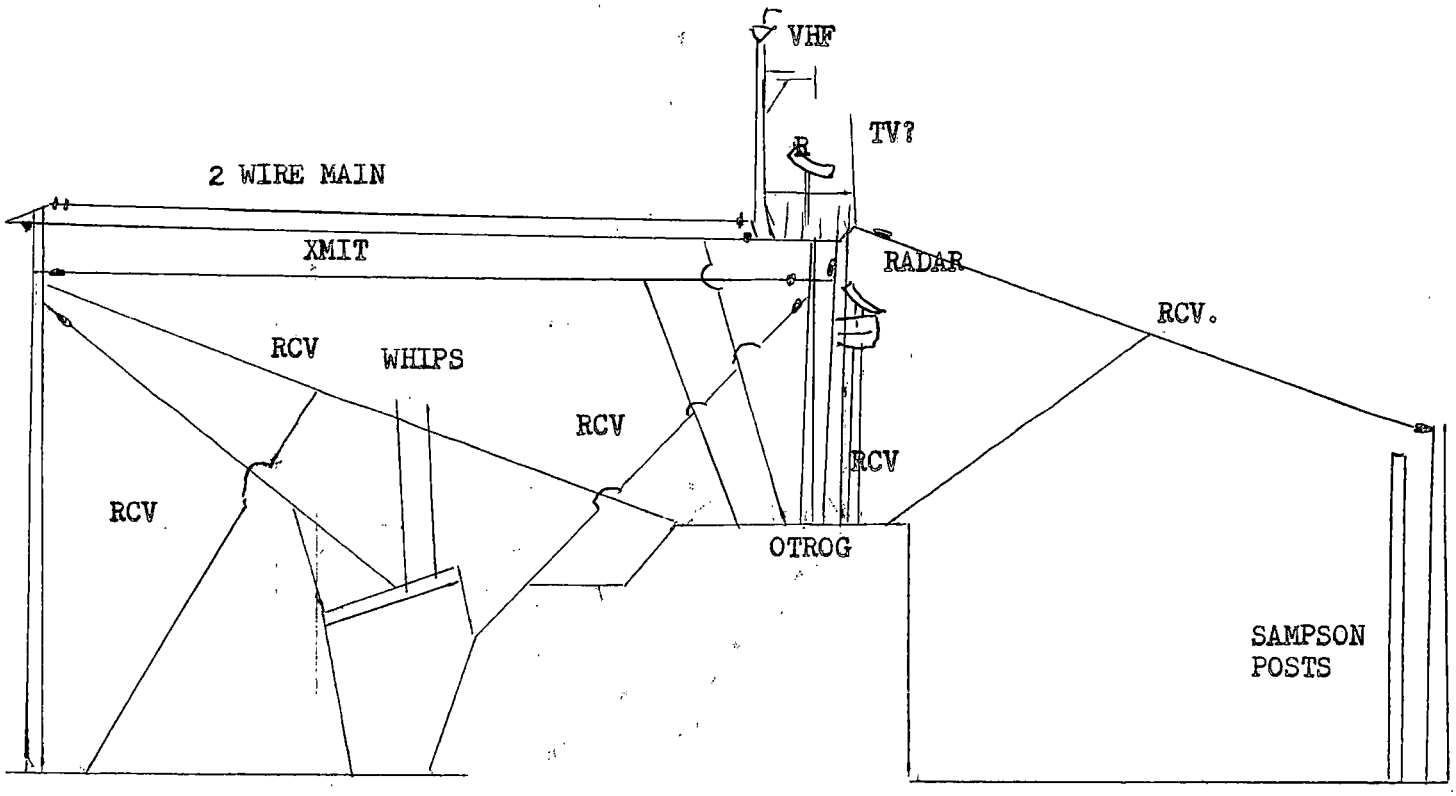
VIII. U.S.S.R.

SHIPPING - Electronic Reports
Trawler OTROG (BMRT 430),
Halifax, 7 October 1966

1. The Soviet trawler OTROG (BMRT 430) was inspected at Halifax 7 October, 1966. Her callsign is UJXL; port of registry, Riga; Tonnage - gross 3170, net 1225; one first class radio operator carried; crew, 94.

Date of Report: 18 Oct 66
Source: DGI/INT S

SHIP'S ANTENNA SYSTEM

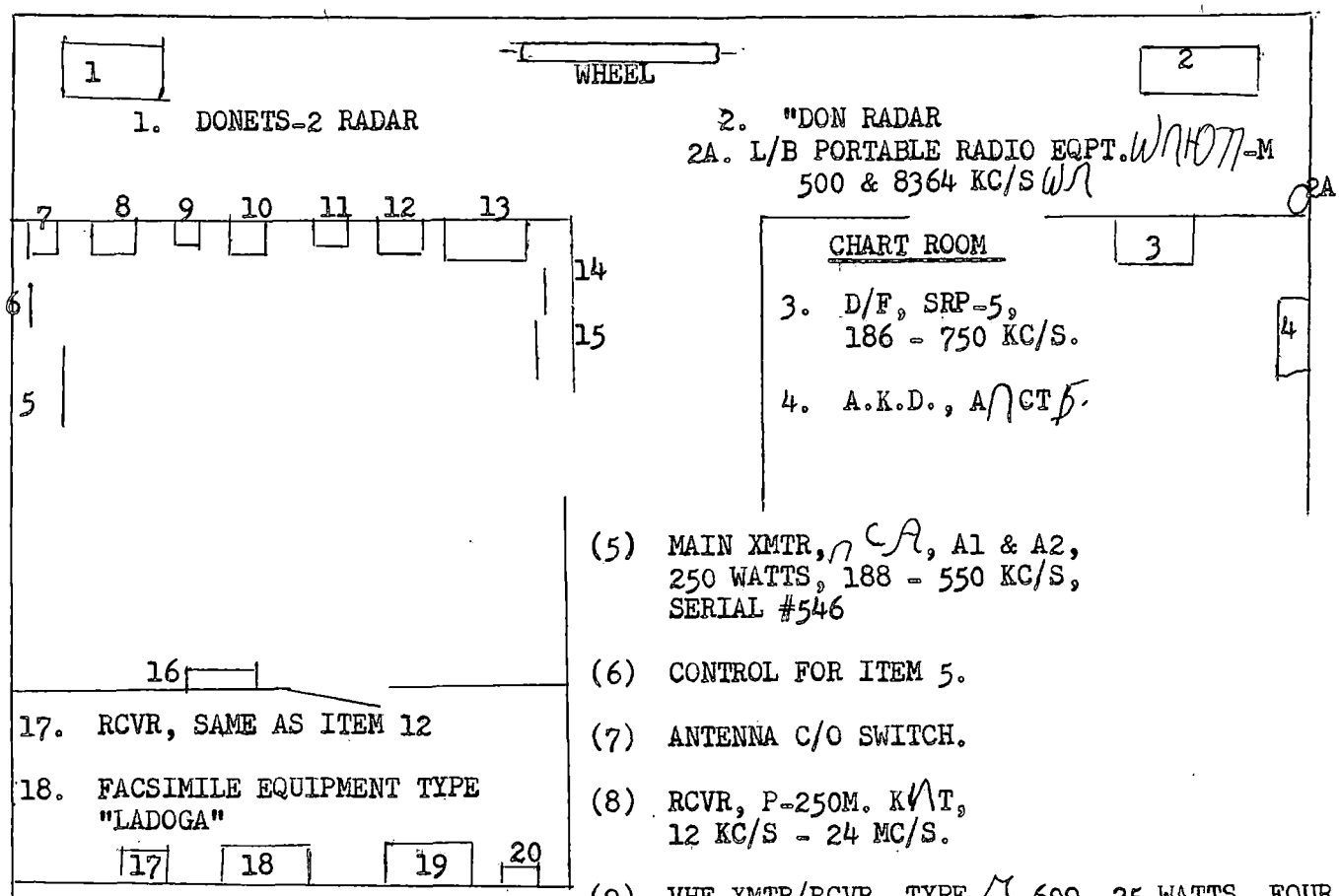


SECRET

Document disclosed under the Access to Information Act
Document divulgué en vertu de la Loi sur l'accès à l'information

(Mership OTROG
electronic report, October 7, 1966)

SECRET
JIB(CAN) 28/66



(5) MAIN XMTR, N CA, A1 & A2, 250 WATTS, 188 - 550 KC/S, SERIAL #546

(6) CONTROL FOR ITEM 5.

(7) ANTENNA C/O SWITCH.

(8) RCVR, P-250M. KNT, 12 KC/S - 24 MC/S.

(9) VHF XMTR/RCVR, TYPE M-609, 25 WATTS, FOUR FREQUENCIES 122.5, 125, 132 & 138 MC/S.

(10) EMGY XMTR, 60 WATTS, TYPE ACN-4, 410 -512 KC/S, 24 VOLT BATTERY SUPPLY.

(11) EMGY RCVR, PAS-1M, 380 - 600 KC/S, 24 VOLT BAT.

(12) MAIN RCVR, BONHA-? SERIAL #195516635, 12 KC/S - 24 MC/S.

(13) XMTR, TYPE EPW -P, 100 WATTS, 365 - 550 KC/S & 1.5 - 24 MC/S, A1, A2 & A3.

(14) CONTROLS FOR ITEM 15.

(15) H/F XMTR, MEPE AATYNKNCK, BEC 480, 250 WATTS, A1, A2, A3, 1.5 - 24 MC/S.

(16) AUTO ALARM, TYPE ANM-3, 500 KC/S.

(19) SHIP'S P.A. EQUIPMENT, RUSSIAN-MADE.

(20) RUSSIAN-MADE TAPE RECORDER.

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JIB/CAN 29/66

SECRET

CANADIAN EYES ONLY

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OTTAWA

CURRENT ZAMBIAN ECONOMIC PROBLEMS

(Working Paper)

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CURRENT ZAMBIAN ECONOMIC PROBLEMS

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CURRENT ZAMBIAN ECONOMIC PROBLEMS

Summary and Conclusions

A. While the major effects of Rhodesia's UDI on the Zambian economy are mainly economic, the impact is also now being felt on race relations in Zambia at a time when the economic problems are multiplying. If this trend continues Zambia is likely to be in for grave difficulties in 1967.

B. Despite Zambian claims to have reduced her imports from Rhodesia by about 60%, our best estimate is that 1966 imports will be reduced about 40% below the pre-UDI level. Nevertheless, the cessation of oil supplies from Rhodesia and the necessity to resort to alternative sources of supply and delivery together with a reduction in coal supplies, so far not compensated for by domestic production or alternative supplies, have had a disruptive effect on Zambia's copper industry on which the stability of the economy depends.

C. The copper mines have now been forced to reduce their production by 33% and if fuel supplies are not substantially increased further cutbacks in Zambian economic activity are likely and unemployment together with popular discontent and racial strife may well increase.

D. Zambia has been forced to re-orientate her lines of communication from Rhodesia to the east, north and west, but this is a long-term project, and alternative routes are not yet capable of adequately handling the volume of traffic previously passing through Rhodesia.

E. Mr. Kaunda has recently announced a Four-Year Development Plan (1966-1970) which appears very optimistic. It indicates that Zambia intends to reduce its economic dependence on southern Africa. However, most projects will take many years to become effective. From an economic point of view, Zambia may well be forcing itself into some expensive economic errors (e.g., in its endeavors to become self-sufficient in coal) in order to cut or decrease its dependence on Rhodesia.

F. In the short term, an outstanding question is whether Zambia will accept British (and Commonwealth) Aid for the immediate sustenance of Zambia if it reduces its imports from Rhodesia and re-orientates its flow of imports and exports to other directions. A sum of £18 million has been mentioned in grants and credits, of which the British contribution is believed to be about £14 million with the balance in finance or hardware from Canada and other Commonwealth countries.

G. Mr. Kaunda reportedly stated on 21 October that Zambia was considering an offer of economic aid from Communist China. If this materializes it will be the first of its kind Zambia has received from a Communist country.

H. Thus one of Mr. Kaunda's immediate major problems is to ensure the highest level of copper production and exports on which the economic welfare of Zambia rests. To do this adequate supplies of fuel must be assured and the labour force kept contented and free from strife.

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General Economic Situation as of 10 November, 1966

1. In spite of a number of isolated incidents, the overall economic situation in Zambia did not deteriorate within the last week. However, the situation remains tense, and it remains to be seen whether the mounting number of resignations of expatriates from the mining companies (150 so far reported) and other firms (100) will snowball into a mass exodus. The cumulative effect of deportations and suspicions of further deportations has produced an uneasy situation and further incidents of a racial character could lead to a deterioration in expatriate morale and an increase in departures.

2. Morale amongst expatriate police is reported at rock bottom, following attempts by UNIP members to persuade African policemen to disobey their officers. Kaunda will have to impose his authority on the party and prevent a recurrence of incidents of this kind if the services of expatriates is to be retained and if reasonable relations between the white and black communities are to be preserved. His first reactions suggest that he fully appreciates this and is acting accordingly.

3. The two main mining companies have announced a further reduction in copper production due to the fuel situation. Production was reduced to 75% in October and is now reduced to 66%. The time may well be near when the companies will be obliged on financial grounds to lay-off labour, despite their reluctance to allow the dispersal of trained men. However, there appears to be little early prospect of an improvement in the fuel situation.

4. According to press reports the US authorities have arrested two persons accused of conspiring to blow up the Katue railway bridge in Zambia on the line connecting Zambia with Rhodesia. The motive seems to have been private profit from the shortage of copper which would result from the disruption of Zambia's communications.

5. Below we set out the latest data available to us on various aspects of the Zambian economy.

Zambian Trade With Rhodesia

6. Despite Zambian claims that she has cut her imports from Rhodesia by about 60%, the best estimate available to us is that Zambia's rate of imports from Rhodesia is now running at about £20 million per annum (representing about 25% of total Rhodesian exports), compared with £36 million in 1965, or reduced by 40%.

7. The breakdown of Zambia's imports from Rhodesia for the period January-June 1966 (£13 million in all) shows substantial falls in imports of most categories of manufactured goods, partially made good by rises in the categories "food, beverages and tobacco", and "crude materials".

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Electricity accounted for £2.2 million of the total £13 million: payments for this are not thought to accrue to Rhodesia, so that in terms of Rhodesia's foreign exchange earnings, the fall in trade was from £17 million in the corresponding period last year to £11 million.- a fall of about one-third. It is likely, however, that the fall was in fact less than this, because some Rhodesian goods are believed to have been exported to Zambia as South African. Total Zambian imports from South Africa were £12.4 million in the half year, compared with £9.6 million in the corresponding period last year.

8. Imports of Rhodesian Coal. The statistics show that Zambian imports of coal from January-June 1966 continued at about last year's rate. Since June, of course, the rate has fallen off markedly because of the truck-for-truck system operated by Rhodesia Railways. The Johannesburg Financial Mail of 14 October claims that only 67,000 tons of coal went to Zambia in September, and estimates that of this 30-35,000 tons will have been consumed by the railways, leaving industry, especially the copper mines, in very short supply. The same source claims that in the four months June-September only 284,000 tons of coal entered Zambia compared with a normal consumption figure of 120,000 tons a month.

9. In October, deliveries to Zambia and the Congo are reported to have fallen sharply again, and are said to have been not much above a rate of 30,000 tons a month. The Wankie Colliery company has now announced that because of this heavy reduction in coal sales in Zambia and the Congo, a new system of prices will be introduced in the two countries from 1 November. The implications of this new price policy are far from clear, but it would appear to involve a sharp rise in the price of coal sold to Zambia and to the Congo unless the rate of deliveries is speeded up. Rhodesia made an attempt to increase the price of coal sold to the north last December when she imposed a £5 a ton surcharge, but this was withdrawn after a month.

Fuel Situation

10. According to the best information available to us the fuel supply situation as of 1 November was one of prospects for a continuing shortage of coal supplies and with the outlook on oil supplies such that it could become a problem, but probably with some forewarning.

11. Coal Pre-UDI coal supplies varied between 120,000 and 140,000 tons a month all of which were delivered by rail from the Wankie Coal Fields in Rhodesia. Stocks in Zambia were low because of the frequency and regularity of supplies. Zambian coal imports have declined since June to less than one-third of average at the end of October and stocks in Zambia have dwindled to the emergency level of about 60,000 tons. This is

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required for emergency power supplies in the event of failure of the Kariba and/or Le Marinel Transmission Systems. Its primary purpose is to ensure the continuous de-watering of the mines which otherwise would flood rapidly - and essential care and maintenance.

12. Deliveries from Wankie are unlikely to improve significantly under the present system of "one-for-one" wagon exchange between Rhodesia and Zambia. However some improvement in supplies is expected from the recently opened Zambian coal field at Nkandabwe. The delivery rate of about 15,000 tons a month should be increased in November and may be doubled in December if more rail wagons become available. Even then, if deliveries from Wankie can be continued at the present rate, the total available to Zambia would represent about one half of the normal requirment, (although Nkandabwe coal can be used in place of Wankie coal, its low calorific value make 1½ tons of Nkandabwe equal to 1 ton of Wankie coal).

13. Additional rolling stock is being obtained: first deliveries should be made in the next few weeks but the final consignments may not reach Zambia before the end of February 1967. The prospect on coal supplies is therefore one of continuing shortage.

14. Zambian Prospects for Attaining Self-Sufficiency in Coal. As a result of Rhodesia's UDI Zambia appears to be forcing itself into some expensive economic errors, of which perhaps the biggest is its endeavour to become self-sufficient in coal for use in the Copperbelt. It appears that for medium-term political motives, Zambia is pouring money into mining low-grade, expensive coal, when nearby in Rhodesia is a high-grade, exploited and cheap reserve at Wankie.

15. Zambia has begun to develop its domestic coal resources, the "contingency" field at Nkandabwe came into production in June 1966 and the results of preliminary geological surveys in the Siankandoba area are encouraging. The extent of these reserves is still uncertain, and, even if the reserves are large, it is extremely unlikely that the output will increase enough to meet domestic requirements until after 1970. Transportation facilities within Zambia are adequate to carry the current coal output to consumers in the Copperbelt. The purchase of additional railroad rolling stock would allow Zambia to handle future increases in production.

16. Oil. We understand that the rate of consumption of refined oils is about 4,750 tons a week. The rate of supply is about 5,000 tons a week and according to our best information stocks in Zambia amount to

/about 16,000 tons.

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about 16,000 tons. The Manager of Shell Oil informed our Ambassador that stocks were much lower, and the 30 October explosion at a POL depot at Kitwe will have further reduced stocks. However, supply and demand are now believed to be in balance and, with three and one half weeks of reserves, the position is better than it was in early days of the crisis. However it is impossible to predict whether or not the present position will be maintained. Route capacity is more than adequate for the tonnages involved but input rates have fluctuated from week to week since May. They have never yet fulfilled forecasts and were particularly low in August and September. Reserves have declined by 40 per cent since May, partly because of fluctuating deliveries and partly through increasing local consumption.

17. Supplies by airlift - RAF and Zambian - have accounted for about twenty per cent of total deliveries, i.e., 1000 tons per week. With the withdrawal, in the absence of a Zambian request for continuation of the RAF airlift at the end of October, deliveries may now be reduced to about 700 tons per week. The key surface supply route is the Great North Road in Tanzania. Much of it is gravel surfaced and these sections, particularly in the southern Highlands, could break up after prolonged rain (the rainy season lasts from about November to April). Maintenance and other work have improved the road but it is impossible to forecast whether or not it will stand up to heavy traffic without interruption in bad weather; much will depend upon the intensity and duration of rain in any one week, especially as the vehicles now being used are heavier than those used last March. Last year two-ton, five-ton and a few seven-ton vehicles were used, whereas this year additional vehicles up to at least articulated twenty-ton vehicles are available.

18. However, according to press reports of early November the Lockheed Aircraft Corporation has entered into a long-term contract to provide four Hercules propjet airfreighters to import petroleum products from Dar-es-Salaam to Ndola and export copper. It is intended that the four aircraft will each complete two round trips per day.

19. Procurement of Oil Productsby Zambia. Possibly from Rhodesia. We have no further information concerning a report of early October that the Shell group who manage the Umtali refinery in Rhodesia recently suggested to the manager of the refinery that he should investigate with his oil company contacts in Zambia the possibility of the Umtali refinery processing crude oil for Zambia's sole use, perhaps under international supervision.

20. The Shell group who manage the Umtali refinery on behalf of CAPREF have hitherto complied with the Smith government's emergency regulation which forbids the discharge of staff, and have maintained a full complement at the refinery since it ceased operations in January. But in order to finance this, they have had to sell off all stocks of oil at the refinery and are now facing the necessity of local borrowing if they are to avoid dismissing all staff and closing down completely. Shell estimate that, if the plant were put "into mothballs", it would take six months to make it fully operational again. At the moment Shell are still prepared to put off a decision in the hope of a political settlement.

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21. Procurement of Oil Products from Tanzania. According to a secret report, a delegation led by K.H. Ameir, Principal Secretary, Tanzanian Ministry of Industries, Mineral Resources and Power, visited Lusaka from 11 July to 13 July, 1966, in order to negotiate the sale to Zambia of petroleum products from the TIPER oil refinery, recently established at Dar-es-Salaam, and to explore the possibility of participation by the Zambian government in various projects in Tanzania, including the oil refinery.

22. Zambian officials told the delegation that a directive had been issued to the Mobil Company, a contractor to the Zambian/Tanzanian Transport Company, to get its products from the Dar-es-Salaam refinery. Zambian officials considered that Tanzania would be Zambia's cheapest source of petroleum products and undertook to direct other oil companies to import from the Dar-es-Salaam refinery.

23. The Tanzanian delegation was informed that Zambia had no plans to establish an oil refinery under the present four-year development programme. For the next seven years, therefore, Zambia would depend upon Tanzania and other sources for petroleum products. Zambian officials said that when details of the Dar-es-Salaam refinery had been supplied, Zambia's participation in the project would be considered. Zambia was particularly interested in the manufacture of bitumen, one of the possible byproducts of the refinery.

24. Of the other Tanzanian projects discussed, the Zambian officials expressed interest in the Nyanza salt mines, the Tunduma beef ranch, and the manufacture of gunny bags. The Tanzanian delegation undertook to supply further details of these projects. Both countries were considering nitrogenous fertilizer projects; Zambia from coal, Tanzania from oil refinery gases, and it was agreed that the respective economics of the two projects should be studied. The Zambian officials also proposed that a joint fishing and fish processing project should be established on Lake Tanganyika.

25. On 21 July K.H. Ameir notified the Tanzanian Ministry of Commerce and Cooperatives of the results of the delegation's visit to Lusaka. He also commented that the oil companies appeared to be by-passing the Dar-es-Salaam refinery by importing petroleum products for transit to Zambia. Ameir said that the Tanzanian government could not stop such transit trade and that it was, therefore, important to persuade the Zambian government to act with some urgency in directing that petroleum products should be obtained from the Dar-es-Salaam refinery. Otherwise it would be impossible for the refinery to operate at full capacity.

The Copper Industry

26. According to press reports the two major Zambian copper companies announced on 6 November a second cut-back in refined metal production to 66% of normal production. This follows a cut-back to 75% made on 16 October because of a shortage of coal imports needed for refining. In 1965 Zambia's copper exports totalled 733,400 tons, or an average of about 60,000 tons a month or 2,000 tons a day. In October 1966 copper exports

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were probably not more than 45,000 tons a month, and this can now be expected to drop to about 40,000 tons a month -- an amount that could theoretically by shipped out by other than the Rhodesian route. Mining and milling of copper ore is at present reported to be continuing at capacity and copper concentrates are being stockpiled. However, if such stocks become impossibly large the mines may be forced to cut-back mining and milling, an action which would make thousands of African workers idle.

27. A Roan Selection Trust official informed our Ambassador recently that it was by no means certain that the copper industry could maintain production and that it was probable that one-third of smelters would be closed down by December in order to concentrate available coal and oil supplies. The industry is concerned about the metallurgical and sociological problems not to mention the loss of revenue to industry and the government from shutdowns. A press report from Lusaka of 6 November indicated that the Zambian mining companies intend to reduce their labour forces as the result of the latest cut-back in copper production and have put up three proposals for reducing the number of workers to the Mine Workers Union.

28. A shortage of fuel supplies, which come mainly from outside Zambia, has caused the cutback. One company official says he hopes the action will force the Kaunda government to realize that its pre-occupation with minimizing trade contacts with Rhodesia is hurting Zambia's copper-based economy and its social development programmes. The country's current trade patterns bypass Rhodesia except for specific government-declared "essential" goods. Alternative routes and sources of supply have been woefully inadequate and show little prospect for significant short-term improvement. Tension between Lusaka and Salisbury has severely limited even those imports the Zambians term "essential," notably Rhodesian coal for Zambia's copper smelters and Zambian stocks of both coal and fuel oil have dropped to critical levels as a result. Solution of the fuel supply crisis would require a political decision to return to much higher levels of trade with Rhodesia, at least for the next several months. Such a shift would, however, take time to implement and any emergency foreign assistance would provide little immediate relief. If fuel supplies are not substantially increased, further cutbacks in Zambian economic activity or development programmes are likely, and unemployment and popular discontent will rise.

29. (Not Used)

30. <u>Labour Force in the Copperbelt.</u> Zambia with a population of 3.6 million, of which some 2 million are living at subsistance level, has a total work force of 300,000. The 50,000 employed in the mining industry (of which about 43,000 are African miners) are considered the best paid, housed and generally provided for in the country. Some 5,000 expatriate staff occupy key technical and managerial jobs.

31. In 1965, the average African wage in the mines was £390 per annum compared with £1,500 for whites. The recently recommended 22% increase in pay for the African miners would raise the lowest African workers monthly pay from £22 to £27 per month, and the highest from £140 to £185 a month.

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32. The Effect on the Zambian Economy of Race Relations in Zambia. While in the first half of 1966 the effects of the Rhodesian crisis were more economic than social, the impact is now being felt on race relations in Zambia at a time when the economic problems are multiplying. If this trend continues Zambia is likely to be in for grave difficulties in 1967.

33. One source of potential trouble lies in the insatiable demands of the African Mining Unions. Although the mine workers have just received a 22% wage increase it is widely predicted that early in 1967 they will challenge government wage policy and that the government will then force workers back to the mines by using police and the army. Race relations are bound to suffer if this happens because the mines are regarded by Africans as white dominated, and the influence of militants in Kaunda's own party may increase sharply.

34. Following the recent deportation of 25 expatriates most of those remaining are said to be convinced that there is no settled future for them in Zambia. More deportations are said to be in the offing and attacks on whites by blacks in Kitwe on 30 October have no doubt added to the sense of insecurity of the expatriates, many of whom are worried by the programme of Zambianisation in government, industry and commerce. On the African side there is an increasing tendency to regard most whites as traitors.

35. On 27 October Kaunda announced that no one in Zambia is indispensable and that racially minded whites should get out. If this advice were followed Zambia could soon be in sorry economic and social straits. While most whites in government and copper mining might be replaced relatively easily by recruiting abroad, where they are displaced by Zambians, efficiency is likely to suffer because of the critical shortage of trained Africans.

36. In commerce, Zambianisation is proceeding fairly rapidly, though jobs at the supervisory and executive levels are still held by whites. However, in the fields of small business, service industry and agriculture the departure of the whites would be seriously detrimental to the functioning of the economy, as they are not normally replaceable.

37. Expatriate Morale. Expatriate morale, particularly on the Copperbelt can now be said to be at rock bottom. Resignations by expatriate miners continue to rise. The current figure of approximately 150 is far higher than is usual at this time of the year. It is causing much concern to the mining companies particularly as a proportion of these resignations are from executives as opposed to industrial grades.

38. The Present Copperbelt Situation. Following the recent disturbances the situation on the Copperbelt has been reasonably quiet over the week ending 10 November and appears under control. However it could quickly deteriorate again. Further racial strife and/or further

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deportations could lead to a rapid deterioration in expatriate morale and an increase in departures.

39. During the first week of November officials of the United National Independent Party (UNIP) have claimed that the recent fire at the Kitwe POL Depot was an act of sabotage, although all the evidence available to us indicates that it was of an accidental nature, as has been indicated by the "Times of Zambia". However, the future is somewhat uncertain and it remains to be seen how many expatriates will resign as the result of the disturbances. The disturbances may well act as a deterrent to future recruiting, so that a net loss in manpower can be expected.

The New Four Year Development Plan (1966-70)

40. On 31 October the Zambian Government published details of its Four Year Development Plan (1966-1970) on which it is intended to spend £429 million ($1.2 billion). The Government's minimum investment will be £282 million and private investment is estimated at £147 million. The maximum amount envisaged as required from external borrowing is £75 million.

41 The Plan is intended to diversify the economy, now almost entirely dependent on copper, to increase employment by 25%, to raise the average annual value of output per capita from $170 to $250, to maintain price stability, reduce the economic imbalance between urban and rural areas, raise educational levels, provide more housing, and improve communications, energy sources and transport.

42. The Plan envisages a growth rate in the gross domestic product of more than 11% each year with considerably increased growth rates in sectors other than copper mining. The Plan lays heavy emphasis on the need to develop agriculture. The expansion of education will cost £39.4 million; £19 million is allocated to development of road links north to Tanzania and eastwards to Malawi; £5 million has been earmarked for the projected 1000 mile railway from Central Zambia to the Tanzanian coast; £26 million is allocated for hydro-electric expansions, including £11 million for a new hydro-electric dam on the Kafue River.

43. With the effects of UDI threatening Zambia's economic prospects this Plan appears very optimistic. It indicates steps Zambia intends to take to lessen the effects of UDI and to reduce its economic dependence on southern Africa. However, such projects as new tarmac roads to Tanzania and Malawi, the Kafue hydro-electric power scheme, the new oil products pipeline to Dar-Es-Salaam and major import-substituting industries such as steel and nitrogen will take many years to become effective. It is noticeable that only £5 million is being set aside for the projected rail link to Tanzania, estimated to cost over £100 million. Continued higher wage demands by the African labour force threaten to disrupt the Plan. Futhermore, the availability of skilled manpower, price stability and the rate of progress in developing the transport system will be major factors governing the success of this ambitious expenditure programme, not to mention the ability of the not very efficient government machine to cope with the Plan.

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44. Kafue Power Project. On 26 October President Kaunda announced that Zambia will build the long planned hydro-electric plant on the Kafue River, about 40 miles south of Lusaka Work is expected to start in early 1967. Modest provision has been made for financing it in the new Four-Year Development Plan, but outside assistance will also be required. This project has not replaced Zambia's interest in developing her own power plant at Kariba, but it will provide her with a degree of independence in power supplies.

Foreign Aid Problems

45. Commonwealth Aid. To date the Commonwealth-Aid-to-Zambia Plan estimated to contain about £18 million worth of grants and credits for the immediate sustenance of Zambia in its programme of economic self-sufficiency has not been accepted by Zambia. The British contribution to this sum is believed to be in the order of £14 million, with the balance expected to come in finance or hardware from Canada and other Commonwealth governments. This plan is designed to assist Zambia in reducing its imports from Rhodesia and re-aligning the flow of its imports and exports by developing new road and rail routes to the east and west. There is evidence to indicate that certain Zambian officials consider this policy is wrong. It would mean in the short run, higher costs, which might be borne as a temporary burden. In the long run it could permit the argument to be used that Zambia was no longer dependent on Rhodesia and that future political developments there would only affect her marginally. This may well not be acceptable to Zambia.

46. Possible Chinese Aid. President Kaunda reportedly stated on 21 October that Zambia was considering an offer of aid from Communist China. A Zambian government delegation, including the Vice President and the Foreign Minister, visited China in August, 1966 and the Chinese are said to have offered Zambia a substantial loan during the visit. This is the first communist economic aid offer to Zambia although a cultural agreement providing for exchanges of students, teachers and doctors was concluded with the Soviet Union in August, 1966.

47. Italian Aid to Zambia. Aggressive salesmanship by Italians in Zambia has paid off this year since Zambia decided to re-direct trade and communications from Southern Africa. Italians have an aid programme in Zambia and soft loans account in part for the success, in face of firm British and Japanese competition, of the Italian State oil monopoly, Ente Nazionale Idrocarburi (ENI), in securing the contract for the construction of an oil products pipeline between Dar-es-Salaam and Ndola. (Our Ambassador suggests that bribery of Tanzanian and Zambian officials may have played a part too).

48. The contract is reported to be for $45,000,000. The pipeline will be jointly owned by the Tanzanian and Zambian governments and is being financed by a loan from MEDIOBANCA (a consortium of Italian banks)

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repayable in 15 annual installments, the first payable one year after operation of the line begins, with an interest rate understood to be 6%. The agreement has still to be formalized between Italy, Zambia, and ENI but it has been announced that all sides have accepted a 22-month constructual completion period.

49. The Italians have also sold a Fiat assembly factory, opened an Italian Commercial Bank and substantially increased their exports to Zambia. They may also get a contract for the new Kafue dam project.

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Ottawa

Communist Economic and Military Aid Activities in the Underdeveloped Areas

October 1966

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Department of National Defence
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COMMUNIST ECONOMIC AND MILITARY AID

ACTIVITIES IN THE UNDERDEVELOPED AREAS

OCTOBER, 1966

PART I: ECONOMIC AID

LATIN AMERICA

Brazil

1. Roumania and the state of Matto Grosso in Brazil are in the process of concluding a trade agreement. The negotiations and the agreement have been approved by Brazil's Foreign Ministry. The agreement reportedly calls for $50 million in trade over a ten-year period. Products involved in the trade exchanges include Matto Grosso minerals including iron ore, manganese, tin, industrial diamonds and agricultural products for Roumanian machinery and equipment including tractors, cement plants and refrigeration equipment. (RESTRICTED)

2. Under contracts signed in October, 1966 the Soviet Union has purchased $500,000 worth of coffee from Brazil. This is the first step in the implementation of the Soviet Brazilian trade protocol signed in August 1966. In the period January-September, 1966 the Soviet Union bought coffee valued at $1.6 million from Columbia. (UNCLASSIFIED)

3. Brazil has purchased 50,000 tons of Bulgarian wheat valued at about $3.5 million. The agreement under which the sale was made gives Brazil an option to buy an additional 50,000 tons. The sale may help to correct Bulgaria's adverse balance of trade with Brazil. Bulgaria reportedly has had an above average wheat crop this year and has offered to sell small quantities of wheat to other non-communist countries. (RESTRICTED)

Uruguay

4. A Soviet credit offer to Uruguay, estimated to be valued at $30 million, (JIB(CAN) 21/66) for the purchase of Soviet capital goods is reported to be under discussion by various Uruguayan government departments and apparently the initial reaction to the Soviet offer has been unfavourable, although a Soviet suggestion that part of the repayments be made in the form of non-traditional Uruguayan exports has met with general approval. A final decision has not yet been reached. (RESTRICTED)

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ASIA

Ceylon

5. In addition to 41,000 tons of rubber contracted for under a 1966 bilateral trade agreement with Ceylon, Communist China recently negotiated the purchase of another 12,000 tons from Ceylon. One of the reasons for China's increased rubber purchases is the suspension of trade between China and Indonesia, which was a major source of rubber for China until 1965. Communist China is now the largest purchaser of Ceylon's rubber. (UNCLASSIFIED)

India

6. The second section of an oil refinery built with Soviet aid has been completed at Koyali. The refinery can now process two million tons of crude oil a year. An Indian report states that by the end of the Fourth Five Year Plan oil refineries constructed in India with Soviet assistance will be producing more than eight million tons of oil a year, and will account for about 40 per cent of India's requirements. (UNCLASSIFIED)

7. The Soviet Union is reported to have sought permission to open a branch of the Soviet State Bank in India and has suggested that such a bank would facilitate trade transactions between India and East European communist countries. The Soviet proposal is to be examined but the initial reaction was reported to be unfavourable. (UNCLASSIFIED)

Malaysia

8. A Malaysian trade delegation visiting in the Soviet Union during September left Moscow without concluding a formal agreement on improving trade relations between the two countries. Malaysia has no trade agreement or diplomatic links with the Soviet Union but has a substantial surplus in its trade with that country. The Soviet Union imports rubber and tin but exports are mainly consumer goods. The Soviet Union would like to expand its trade with Malaysia and has been pressing Malaysia to import Soviet machinery. (UNCLASSIFIED)

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Nepal

9. Under a recent agreement Communist China has agreed to convert 160 million rupees in economic aid credits, extended to Nepal in 1956 and 1960, into £12 million sterling. The conversion was made at the gold standard value of the two currencies prior to the devaluation of the Indian rupee. Chinese and Nepalese banks concerned will now change the Indian rupee account into a pound sterling account, including the utilized and unutilized portions of the Chinese credits. According to a Chinese report this action was taken to prevent India's rupee devaluation from adversely affecting Nepal's economic development programme. (UNCLASSIFIED)

10. The total value of Communist China's economic aid extended to Nepal is $43 million of which about $11 million has been drawn. (CONFIDENTIAL)

Indonesia

11. Following a series of discussions in Belgrade between Indonesian and Yugoslav government officials it was announced that Yugoslavia had agreed to defer payments due on development credits extended to Indonesia. One or two projects now underway will be suspended but work on others will be continued. (RESTRICTED)

AFRICA

Somalia

12. During a recent visit to Moscow by the President of Somalia the Soviet Union apparently agreed to postpone until 1970 all repayments due for military and economic aid extended by the Soviet Union. Somalia first requested relief in servicing its debts to the Soviet Union in May, 1966 but no agreement was reached until the President's visit. (SECRET)

13. The total value of Soviet economic aid to Somalia is estimated at $57 million of which about $20 million has been drawn. (SECRET)

Gabon

14. Roumania has concluded an agreement with Gabon to exchange Roumanian oil production equipment for Gabon crude oil. (UNCLASSIFIED)

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Togo

15. Togo has concluded its first economic aid agreement with the Soviet Union but the value of the aid extended is unknown. The President of Togo is due to visit Moscow in the near future for the formal signing of the agreement. In the past Togo's economic relations with the Soviet Union were limited to trade exchanges involving Togo coffee exports for Soviet household items and tools. (UNCLASSIFIED)

Morocco

16. The Soviet Union and Morocco have concluded economic and technical aid agreements. King Hassan, currently on an official visit to Moscow, was present at the signing of the agreements. The value of the economic aid agreement was not disclosed, but is believed to be substantial. (RESTRICTED)

Libya

17. A Soviet official is reported to have submitted proposals to the Libya's Minister for Agriculture for the construction of five abbatoirs on credit, repayable over a ten-year period. The Soviet offer is being studied and if accepted would constitute the first credit agreement between Libya and a communist country. (UNCLASSIFIED)

Zambia

18. President Kaunda reportedly stated on 21 October that Zambia was considering an offer of aid from Communist China. A Zambian government delegation, including the Vice President and the Foreign Minister, visited China in August, 1966 and the Chinese are said to have offered Zambia a substantial loan during the visit. This is the first communist economic aid offer to Zambia although a cultural agreement providing for exchanges of students, teachers and doctors was concluded with the Soviet Union in August, 1966.

Ghana

19. The government of Ghana is taking steps to re-establish economic relations with the communist countries and has dispatched a five man delegation to the East European communist countries to renegotiate trade agreements concluded by the N'krumah government. In addition, a Soviet delegation which arrived in Accra in September has been reviewing several unfinished Soviet aid

/projects, including

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projects, including the Tamale airfield, a gold refinery, an atomic reactor and textile mills. In some cases the review being undertaken involves an assessment of the feasibility of continuing the project. Negotiations are also underway for the return of Soviet technicians to Ghana.

20. In December, 1965, when the N°krumah regime was unable to pay its creditors, Czechoslovakia, East Germany and Hungary agreed to a moratorium on all payments of principal and interest due in 1966 and 1967 and Poland refinanced half of the principal and interest payments due in 1966 and 1967 at an interest rate of 2.5 per cent. In the case of the Soviet Union half of all principal and interest payments due in 1967 through 1970 were deferred. (CONFIDENTIAL)

Sudan

21. Discussions have been held between Sudan and Roumania concerning a Roumanian offer to assist in oil exploration. The Sudanese Minister of Industry is scheduled to visit Roumania in October when an agreement may be concluded. (RESTRICTED)

Tunisia

22. A protocol covering details of goods to be exchanged between Tunisia and Hungary and allowing for an increase in the volume of trade between the two countries was signed recently in Tunis. This supersedes a trade agreement concluded in 1960. A scientific and technical cooperation agreement was also concluded. (UNCLASSIFIED)

Mauritania

23. Mauritania concluded its first trade agreement with the Soviet Union on 17 October, 1966. Under the agreement the Soviet Union has agreed to deliver a wide range of machinery and equipment, rolled ferrous metals, cotton fabrics and chemicals in exchange for traditional Mauritanian exports including groundnuts and dates. A protocol was also signed on the delivery of Soviet machinery worth up to $3.5 million in the period 1967-1969. Forty per cent of the cost of deliveries would be covered by Mauritanian goods and sixty per cent by free currency. (RESTRICTED)

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MIDDLE EAST

Iran

24. According to a US report Iran is reported to be unable to meet a $500,000 payment due to Czechoslovakia for preliminary surveys and engineering drawings on a machine tool plant to be constructed in Tabriz under a Czech loan for $15 million extended in 1965. The Czech loan provided for the foreign exchange cost of equipment for the plant but the costs of technical assistance, survey work and other services were excluded from the agreement. Payments for these services are to be made in accordance with the trade and payments agreement in force when payments are due. The total cost of the machine tool plant is estimated at about $30 million of which about one-half will be in foreign exchange. According to the report, the timetable for the machine tool plant now appears to have been altered and ground breaking is not expected to begin until early in 1967. (CONFIDENTIAL)

Syria

25. Soviet Deputy Foreign Minister Semenov visited Damascus recently and is reported to have discussed Soviet aid for Syria's Euphrates Dam. Plans for the first stage of the dam were drawn up with the aid of Soviet technicians. and will be submitted to the Syrian government at the end of November. Previous reports have suggested that Soviet aid for the dam may be about $140 million. (RESTRICTED)

26. A Syrian trade mission, which arrived in Moscow on 28 October, is reported to be discussing increased commercial ties with the Soviet Union. The official Soviet News Agency, Tass has reported that both sides are discussing the whole range of trade for 1967 and are likely to conclude an additional protocol to the existing trade and payments agreement. The original agreement was signed in November, 1965 with a most-favoured-nation clause and a debt ceiling of $500,000. (UNCLASSIFIED)

UAR

27. Details are now available concerning an economic and technical protocol concluded between the UAR and East Germany at the end of October, 1966. The protocol provides for industrial cooperation in the chemical, crude oil and pharmaceutical fields, especially in increased production of pesticides and insecticides, which will also be imported from East Germany. The protocol

/also covers cooperation

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also covers cooperation in oil prospecting and the export of oil and by-products to East Germany. Similar agreements were reached in the engineering and industrial fields at a recent meeting in Cairo of the UAR/East German industrial-cooperation working group. (UNCLASSIFIED)

Kuwait

28. The Kuwaiti Minister of Commerce visited Moscow at the end of August and it has now been announced that a Soviet delegation, including petroleum experts, is expected to visit Kuwait in November at the invitation of the Kuwaiti government. According to a UK report the Soviet Union will tender for the replanning and extension of Kuwait's main seaport. (UNCLASSIFIED)

29. The Kuwaiti Minister of Commerce is also scheduled to visit Communist China. (UNCLASSIFIED)

PART II: MILITARY AID

LATIN AMERICA

Cuba

Possible New Military Aid Agreement Between USSR and Cuba

30. A new military aid agreement between the Soviet Union and Cuba may have been signed when Raul Castro, the Cuban defence minister, visited Moscow last spring. The first significant arms shipments to Cuba in over two years were made in September and October and both included aircraft, the first since mid-1964. The October delivery included at least 13 MIG-15's and 17's and two MIG 21 FL's (the all-weather version of the MIG-21). As of 3 November another ship, possibly carrying arms, was expected to arrive shortly. (SECRET)

31. Arms shipments to Cuba have been declining in recent years (10 in 1963, seven in 1964, five in 1965 and four so far this year) and over the past two years are believed to have consisted of spares, maintenance equipment, ammunition and some SA-2 replacement missiles. The

/Soviet Union

...../8

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Soviet Union is estimated to have supplied Cuba with about $500 million (US) worth of military aid since assistance began in mid-1960. The MIG-15's and 17's in the most recent shipments may be replacements for aircraft of this type either worn out or destroyed in accidents. The two MIG-21 FL's are the first of the all-weather version of this aircraft to have gone to Cuba; about 40 of the clear air mass version were received before 1964. (SECRET)

Reduction of Military Air Transport Purchases

32. According to a statement by Raul Castro, the Cuban defence minister, at the end of September, purchases of military helicopters and transport aircraft are to be suspended and instead 100 AN-2/COLT's are to be acquired and used for crop spraying and fertilizing. The aircraft are to be flown and serviced by 250 air force personnel. This is one step in a newly announced program of utilizing Cuban military resources, mainly personnel and transport facilities, to assist the country's lagging agriculture. (UNCLASSIFIED)

ASIA

India

MIG-21 Program

33. The MIG-21 airframe plant at Nasik, near Bombay, was formally opened in October although it was probably completed and actually began assembling aircraft a few months earlier. The MIG-21 production program for this plant, reportedly to be completed by 1970, is believed to total from 185 to 200 aircraft, of which at least 60 are to be assembled entirely from Soviet components. To date over 100 MIG-21's are estimated to have been received from the USSR, including components for about 50 for assembly in India. (SECRET)

Afghanistan

SA-2 Procurement

34. A British report states that Afghanistan has recently received enough SA-2/GUIDELINE surface-to-air missiles to bring its holdings up to the planned figure of 108. (SECRET)

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Czech Military Assistance

35. Czechoslovakia as well as the USSR is providing military assistance to Afghanistan, though of course on a much smaller scale. A military technical high school, for example, is reported to have recently been established outside Kabul, containing technical apparatus given by the Czechs and operating under Czech advice. (SECRET)

Cambodia

36. Chinese technical and training assistance is being provided to Cambodia, in addition to actual military equipment. An agreement was concluded in October covering the sending of Chinese technicians "to implement the free military aid of the CPR". (RESTRICTED)

Soviet Equipment

37. In addition to the Soviet aircraft (five MIG-17/FRESCO's and two AN-2/COLT's) recently delivered from the USSR it is reported that 175 tons of ammunition and eight 100 mm anti-aircraft guns have also arrived. These presumably are the battery of eight anti-aircraft weapons which were to be obtained under the March 1966 Soviet military aid grant of approximately $2.4 million (US). With the arrival of the AA guns and the seven aircraft mentioned above all the major items of equipment known to be covered by the Soviet grant have been delivered. (SECRET)

Pakistan

Chinese Technicians in Pakistan

38. On a recent visit to Britain the chief of the Pakistan air force admitted that Chinese technicians were in Pakistan instructing air force ground crews. This is the first firm evidence of Chinese aircraft technicians in Pakistan although it was previously known that PAF technicians, and pilots, had undergone training in China. At least 80-85 MIG-19/FARMERs are believed to have been obtained so far from China. (SECRET)

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AFRICA

Algeria

Receipt of SA-2 Missiles

39. It now seems very probable that SA-2 surface-to-air missiles have been delivered to Algeria from the USSR in recent months. According to a US report three Soviet freighters which called at Algiers since late August delivered a number of cylindrical containers similar to those used to ship SA-2's. Previously it had been suspected that the two freighters which brought arms cargoes to Algeria in September brought SA-2's. The number delivered is not known but a British press report of 26 October from Algiers states that 30 have been acquired. Algeria began receiving SA-2 support equipment in May 1965 but until the recent deliveries only two actual missiles are known to have been delivered. (SECRET)

Value of Aid Received

40. A U.S. estimate now places the value of all Soviet military equipment received by Algeria since the first agreement, signed in the fall of 1963, at least at $150 million (US). No significant arms cargoes are known to have arrived in Algeria during October, strengthening the view that major deliveries under the 1965 agreement (except for naval and perhaps more SA-2 equipment) are coming to an end. (SECRET)

Tanzania

Chinese Assistance

41. In addition to the Chinese technical and training personnel already reported as being in Tanzania (eight instructors training reserves and eight to twelve armourers servicing equipment) it is reported that 50 Chinese, as opposed to seven a year ago, are engaged in training police officers in the use of Chinese small arms. So far as is known there are still no Chinese instructors actually attached to the regular Tanzanian People Defence Force. (SECRET)

Arrival of Possible Chinese Arms Cargo

42. A small Bulgarian cargo vessel is reported to have arrived at Dar es Salaam in mid-September bringing 100 tons of "special" cargo which after off-loading was delivered to Colito Barracks in trucks of the Tanzanian Peoples Defence Force. The cargo is said to have consisted of 66 crates of three different sizes weighing a ton or more each and all marked with Chinese characters. (SECRET-CANUKUS EYES ONLY)

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Guinea

Soviet Aid

43. Crates believed to contain four Soviet jet and three propeller-driven training aircraft have been observed at Conakry airport, according to U.S. information. The types are not specified. Under two small aid agreements with the USSR in 1960 and mid-1965, totalling perhaps ten to fourteen million dollars, Guinea has received some small naval craft, tanks and other ground forces equipment and some non-combat aircraft. Also, under the 1965 agreement, Guinean pilots began an accelerated, six-month training program in the USSR, indicating that aircraft were to be received. (CONFIDENTIAL)

Uganda

Chinese Technicians

44. Four Chinese military technicians arrived in Uganda in mid-October and are to be attached to the army battalion equipped with Chinese arms, probably to provide servicing for these weapons. A shipment of Chinese infantry support weapons and small arms, reportedly enough for a battalion, arrived in Uganda in mid-1965. (SECRET)

Mali

Chinese Aid

45. A three member Malian military delegation visited China during October at the invitation of the Chinese ministry of defence. It is not known if additional Chinese military aid to Mali was discussed. However, small scale Chinese aid continues, probably under the agreement of late 1964, and it is reported that some 20 Chinese military instructors and specialists arrived in Mali in August to establish training centres for paramilitary and "pioneer youth" organizations. (SECRET)

Somalia

Debt Relief

46. The Somalian president, accompanied by some military personnel,

/visited Moscow

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visited Moscow in September and it is now reported that an agreement has been reached postponing until 1970 all payments due for Soviet military and economic aid. It is also possible that additional military training assistance was discussed. The value of the 1963 Soviet-Somalian arms agreement, under which the aid has been received, is believed to total about $40 million (US). (SECRET)

MIDDLE EAST

Cyprus

Return of Missile Trainees from UAR

47. Most of the 350-odd Greek Cypriots who went to the UAR in late 1965 or earlier this year for training on surface-to-air missiles have returned to Cyprus. The Canadian Forces Adviser in Cyprus has reported that according to a source "who is in a position to have information" those who had not returned were remaining to complete their training and that there were no plans for sending any more men to the UAR for missile training. There is still no evidence of preparations to move the SA-2's to Cyprus or to deploy them on the island. (SECRET)

Syria

Pilot Training in USSR and Czechoslovakia

48. According to a recent British report, during the last two years 26 or 28 Syrian air force officers, 21 of whom are pilots, were sent to Czechoslovakia for training on the MIG-17/FRESCO and MIG-21/FISHBED; all have now returned to Syria. (SECRET-CANUKUS EYES ONLY)

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TABLE I

Communist Economic Aid Extensions

1 January - 31 October 1966

Extended By	Recipient	(Million US) Value
Soviet Union	Iran	290.0
	Pakistan	20.0
	Syria	148.0
	Cameroun	7.7
	Burma	14.0
	Somalia	4.2
	India	630.0
	Pakistan	84.0
		1,197.9
Czechoslovakia	Pakistan	28.0
Hungary	India	52.5
	Syria	14.0
		66.5
Bulgaria	Syria	15.0
	India	15.0
		30.0
Communist China	Tanzania	8.5
	Cambodia	42.9
		51.4
	TOTAL	1,373.8 million

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JIB(CAN) 31/66

DATE 15 December 1966

JOINT INTELLIGENCE BUREAU
Ottawa

PA

JIB/CAN 31/66

SUMMARY OF ITEMS OF ECONOMIC AND TOPOGRAPHICAL INTELLIGENCE FROM CANADIAN SOURCES

November/December 1966

(Unevaluated Information)

JOINT INTELLIGENCE BUREAU

Department of National Defence

OTTAWA, CANADA

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ITEMS OF ECONOMIC & TOPOGRAPHICAL INTELLIGENCE FROM CANADIAN SOURCES.

November/December 1966

The Director JIB(Ottawa) would be grateful for any suggestion or comments that the recipients of this Summary may care to make.

NOTE: High grade prints of photographs in this publication may be obtained, or negatives borrowed, from the Director (JIB) Ottawa).

EVALUATIONS

A. Completely reliable
B. Usually reliable
C. Fairly reliable
D. Not usually reliable
E. Not reliable
F. Reliability cannot be judged

1. Confirmed from other sources
2. Probably true
3. Possibly true
4. Doubtful
5. Probably false
6. Truth cannot be judged

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SECRET
JIB(CAN) 31/66

I. CZECHOSLOVAKIA

AIRCRAFT PRODUCTION
Vodochody, 17 Nov 66

1. The Canadian Forces Attache, accompanied by the British Air Attache, on 17 November 1966 made an attempt to get long range photographs of the Vodochody factory airfield.

2. A pan series of 40cm photographs was taken of the factory buildings from coordinates VR567623. Another group of photos was taken from approximate coordinates VR562630 concentrating on the aircraft lined up on the tarmac. Source saw two FISHBED aircraft for certain and these had bowsers beside them. Adjacent to the FISHBED was a line of about six aircraft which source could not identify for sure. They could have been either FISHBED or DELPHIN. A DELPHIN flew overhead while Source was driving along the background and a little later while driving along the main road in front of the factory a DELPHIN took off at 1028 hrs. In addition to the above he observed one CRATE (civilian markings) and 2 FISHBEDS parked in the hangar area. On the airfield near the Northwest end of the runway is an RL2D radar.

4. Further to the above report on VODOCHODY, advantage was taken of a few hours of unusual bright sunshine. On Sunday, 20 Nov 66, and a

4. On Sunday, 20 Nov 66, the factory was on strictly a "Sunday routine" basis - there were no buses parked in the area of the office buildings and there were no jet aircraft on the field. (The CRATE mentioned above was still in the same position). Only the guard on the gate was observed plus two or three people walking in the area of the office buildings.

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Photographs are available from JIB(Ottawa)

Evaluation: B-2
Report & Date: IR 50/66 dated 17 Nov 66
Source: CFA/Prague

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CZECHOSLOVAKIA

II.

AGRICULTURE
Mimon, Oct 66

1. During a tour of northern Bohemia in mid-October 1966, a large State farm at MIMON was visited by a reliable Canadian.

2. There, 1,700 dairy cattle and 25,000 pigs are raised. Modern barns and automated feeding systems were demonstrated. Milk production was admitted to be at least one-third less than Canadian averages but pork production was said to be well above Western figures. The farm manager said, however, that pigs are fattened for five to eight months depending on consumer requirements and slaughtering for Czechoslovak consumption is not done until the pig has fattened to 120 to 150 kilograms.

Date of Report: 26 Oct 66
Source: Reliable Canadian

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CZECHOSLOVAKIA

III.

INDUSTRY - Factories
Northern Bohemia, 10-12 Oct 66

1. The Ministry of Foreign Affairs organized a tour of Northern Bohemia 10-12 October 1966, for an interested group of persons. The following observations were reported by a reliable Canadian who was a member of the party.

TURNOV

2. The group visited a small factory where costume jewelry is produced almost entirely by hand operations. This jewelry involves the setting of Czechoslovak and Indian semi-precious garnets. The majority of employees of this factory are girls of about 20 years of age who have exceptionally good eyesight and steady hands; after a few years they must change to other employment because of the strain.

LIBEREC

3. The Textilana factory, which manufactures a wide range of textiles from cheap cottons to cashmere wool, seemed an example of inefficiency. New machinery was being installed in a very antiquated and inadequate building. This may have been the explanation of the obvious disorganization and the disorderly arrangement of production, but the lack of interest and industry among employees seemed also to be symptomatic of more fundamental malaise. For example, source was informed that all production stops twice a day while employees enjoy half-hour breaks for food.

JESTED

4. A new plastics plant was proudly shown. All raw materials are imported (mostly from France and Yugoslavia) and most of the production of plasticontainers is exported. Production appeared to be reasonably efficient by Czechoslovak standards but there was no sign of automation which should have been incorporated in the assembly line of such a new factory. The plant manager said that export prices are fixed by the central authorities and he seemed to have no knowledge of their relationship to costs of production or indeed of the latter.

NOVY BOR

5. The largest glass factory in the world is under construction with all engineering services and skilled labour provided by a Yugoslav contractor. Production is currently scattered through 14 smaller plants in the area, each of them specializing in a different type of glass. These factories will supply 75 per cent of Czechoslovak glass exports to Canada and they are now working on new designs for the large glass display at Expo '67. Source was told that employees with the most experience and skill earn approximately $150-$200 per month.

Date of Report: 26 Oct 66
Source: Reliable Canadian

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IV. PAKISTAN

TANKS - PT76
East Pakistan, November 1966

1. A foreign diplomat told source today that there are a number of PT-76 tanks in East Pakistan. He said he had reasonably reliable information that there are 40 of them and that they came from China. He said that 12 of them were unloaded at CHITTAGONG from a CHICOM ship sometime during the period 27 June to 12 July this year.

2. Source has no confirmation of this from any other source but, having seen the terrain in East Pakistan, there is no doubt that, for a considerable portion of the year, if tanks are to be employed they would have to be of an amphibious type.

Evaluation:	C-3
Report & Date:	IR 67-66 dated 10 November 1966
Source:	CFA/Pakistan

001265

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JIB(CAN) 31/66

V. PAKISTAN

TRANSPORTATION - Vehicles
ZIL, GAZ and KRAZ, 1 Nov 66

1. Reference JIB(CAN) 16/66, page 9, it is now confirmed that the trucks are ZIL-150's and not ZIL-151's.

2. In addition to ZIL-150's the following types are also arriving in quantity:

Truck 4 x 4 - GAZ 63

Dump Truck 4 x 4 - ZIL 585

Truck 4 x 4 - GAZ 69A

Dump truck 6 x 4 - KRAZ 222

3. Source saw the ZIL 150's at Abbottabad, Krachi and Quetta. The GAZ 63's and KRAZ 222's can be seen operating in this area and a large number of GAZ 69A's are on the road - some with civilian departments of government.

4. There are still a large number of these vehicles at CHAKLALA so presumably they are still arriving and the fact that many of the five varities are seen out on the road may indicate that spares are now available.

Report & Date: IR 61/66 dated 1 Nov 66
Source: CFA/Pakistan

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SECRET
JIB(CAN) 31/66

VI. U.S.S.R.

SHIPPING - Merships
Motor Tanker YELSK,
Halifax 17-20 November 1966

1. The Soviet motor tanker YELSK (callsign UWOI) visited Halifax 17-20 November 1966, to obtain ships stores and to carry out minor maintenance on propulsion machinery.

2. Personalities on Board

Captain	VLADIMIR VASILEV
Height	5' 11" - well built - appears muscular
Weight	210 lbs
Hair	Dark, thin, streaked with grey, brushed straight back. Hairline thin.
Eyes	Blue, wears eyeglasses.
Facial Features	Thin face. Hairline moustache. Many gold teeth upper and lower jaw. Described as having western features.
English	Very good
Year of birth	1907

This captain:-
(a) doesn't drink or smoke;
(b) lives in Leningrad;
(c) was captain of a three-masted training vessel (sail) for 15 years, which normally carried 200 cadets;
(d) was last in Halifax in January 1966 as captain of same ship (YELSK).

Date of Report: 1 December 1966
Source: DGI/INT S

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SECRET
JIB(CAN) 31/66

VII. U.S.S.R.

SHIPPING - Fishing Fleet
Factory Trawler KAZAN,
Halifax 16 Oct. - 20 Nov. 1966

1. The Soviet factory trawler KAZAN (RRT 249) (callsign UNGU) was in Halifax 16 October - 20 November 1966, to effect repairs to auxiliary boiler furnace, and general maintenance refit.

2. During the visit it was learned that KAZAN was the flag ship of the fishing fleet and the Chief of the Expedition was in fact on board when the ship arrived; this gentleman later returning to sea via another Soviet fishing vessel. The ship was much better appointed throughout the living quarters than other similar Soviet ships and was also in cleaner and better physical condition.

3. The Captain appeared to be better educated and much more refined than similar Soviet Captains have been heretofore. At some time in the past he has had the Soviet decoration "Order of Lenin" bestowed on him as has also the ship. The Captain stated that the ship was the most efficient fishing vessel of the Soviet fleet and for this reason the Chief of the Expedition had chosen it as his Flag Ship. One source (reliable) stated that many citations and awards made to the ship and ship's personnel were prominently displayed on the bulkheads of the officers' dining room. The same source also stated that the Chief Engineer of the ship had recently been awarded a citation for an act of bravery above and beyond the call of duty, the incident involving the act having taken place at sea.

4. The same reliable source stated that the Chief Mate was the Political Officer and that this officer's manner and decorum were distinctively different from those of the other officers.

5. The ship proceeded direct to Halifax Shipyards Limited on arrival, where previous arrangements had been made for the defective boiler furnace to be repaired. It was at first considered that the furnace only needed a new fire box lining, but on inspection it was discovered that the existing furnace could not be repaired and would have to be replaced by a new unit. The new furnace was procured and transported air express from Scotland. When the ship first arrived a strong desire for a speedy repair was expressed by the Soviets and when it was discovered that a waiting period for the new furnace to be delivered from Scotland was involved, there was much concern. However, as time elapsed the desire for an early return to sea became less evident and toward the end of their stay in port it appeared that the Soviet personnel concerned "couldn't care less" about returning to the fishing grounds. Also, during the waiting period it was decided to have a great deal of repair maintenance carried out including the scraping and painting of the ship's bottom.

Date of Report: 7 December, 1966
Source: DGI/INT S

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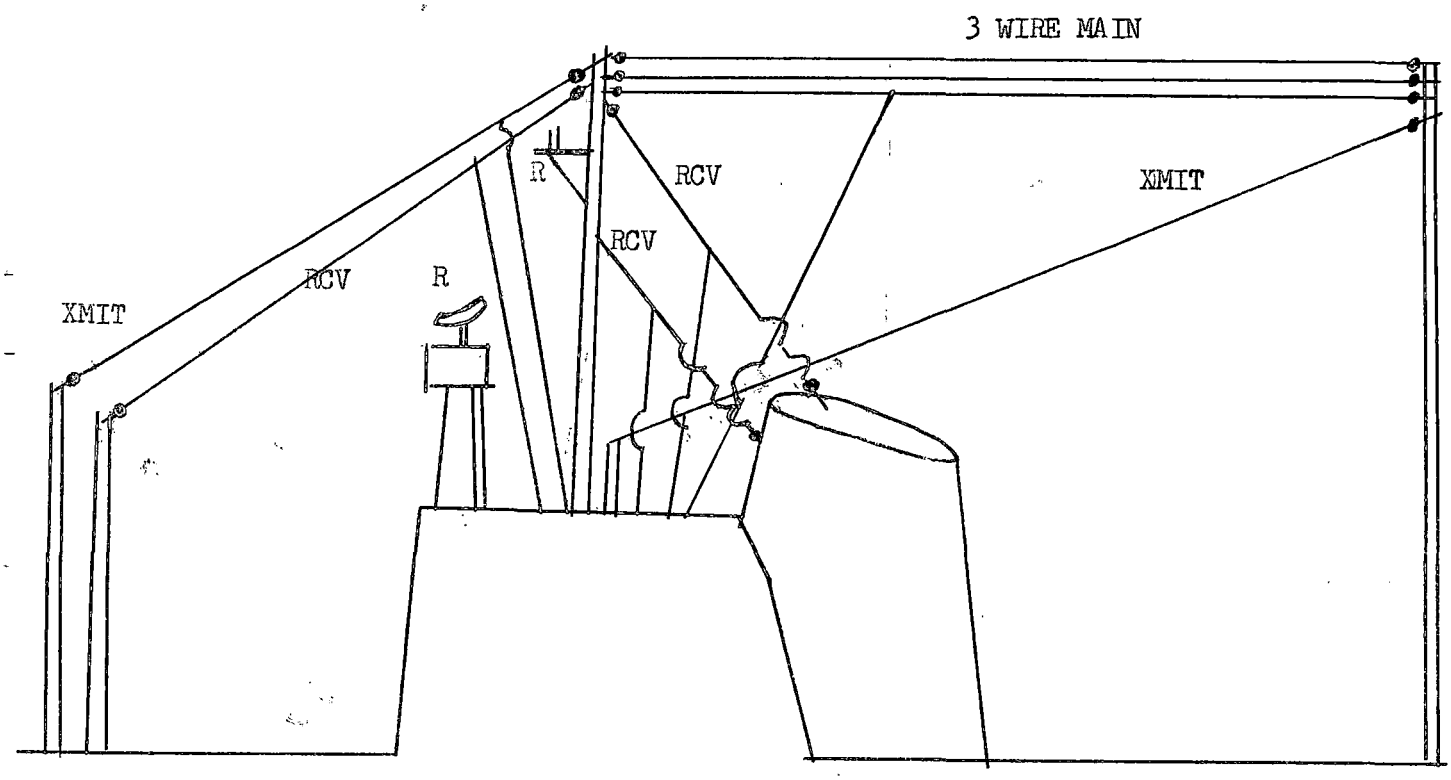
VIII. U.S.S.R.

SHIPPING - Electronic Reports
Factory Trawler KAZAN,
Halifax 18 October 1966 .

1. The Soviet mership KAZAN (RRT 249) was inspected at Halifax 18 October 1966. Her callsign is UNGU; port of registry, Kaliningrad; Tonnage - gross 3001, reg, 1238; two radio operators carried. Safety radiotelegraphy certificate expires March 22, 1967. (English not spoken by Captain or Radio Operators)

Date of Report: 1 Dec 66
Source: DGI INT S

VISUAL INSPECTION OF ANTENNA SYSTEM



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(KAZAN Electronic Report
18 October 66, cont'd)

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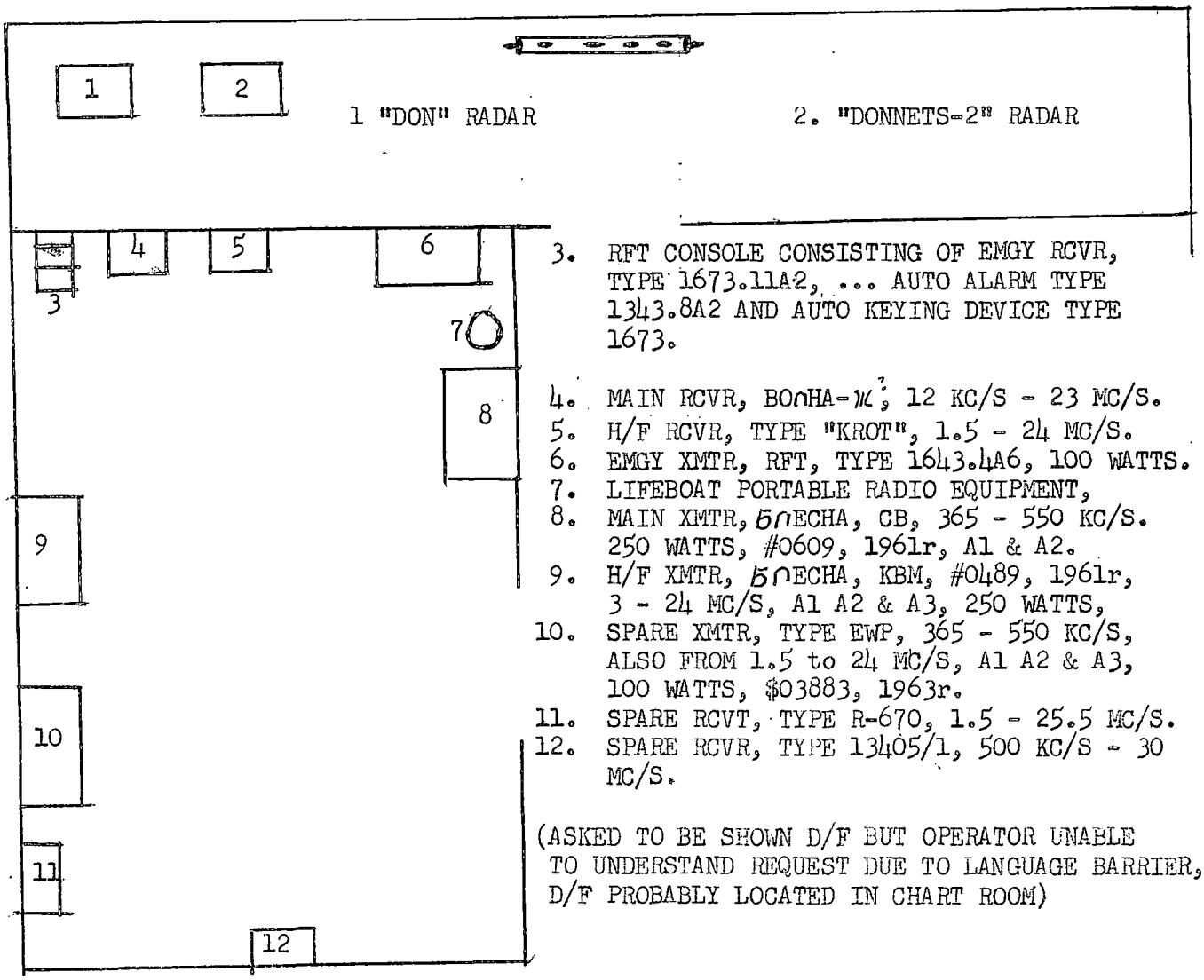
LAYOUT OF EQUIPMENT



3. RFT CONSOLE CONSISTING OF EMGY RCVR, TYPE 1673.11A2, ... AUTO ALARM TYPE 1343.8A2 AND AUTO KEYING DEVICE TYPE 1673.

4. MAIN RCVR, BOПHA-M, 12 KC/S - 23 MC/S.
5. H/F RCVR, TYPE "KROT", 1.5 - 24 MC/S.
6. EMGY XMTR, RFT, TYPE 1643.4A6, 100 WATTS.
7. LIFEBOAT PORTABLE RADIO EQUIPMENT,
8. MAIN XMTR, БПECHA, CB, 365 - 550 KC/S. 250 WATTS, #0609, 1961r, A1 & A2.
9. H/F XMTR, БПECHA, KBM, #0489, 1961r, 3 - 24 MC/S, A1 A2 & A3, 250 WATTS,
10. SPARE XMTR, TYPE EWP, 365 - 550 KC/S, ALSO FROM 1.5 to 24 MC/S, A1 A2 & A3, 100 WATTS, $03883, 1963r.
11. SPARE RCVT, TYPE R-670, 1.5 - 25.5 MC/S.
12. SPARE RCVR, TYPE 13405/1, 500 KC/S - 30 MC/S.

(ASKED TO BE SHOWN D/F BUT OPERATOR UNABLE TO UNDERSTAND REQUEST DUE TO LANGUAGE BARRIER, D/F PROBABLY LOCATED IN CHART ROOM)

Date: 7 December 66
Source: DGI/INT

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IX. U.S.S.R.

SHIPPING - Electronic Report
Soviet Mership KOMMUNARSK,
15-16 August, 1966

1. The Soviet Mership KOMMUNARSK (callsign UNVF) arrived at Churchill approximately 9:30 p.m. on Monday evening, 15 August, 1966.

2. He went aboard the KOMMUNARSK and met the Chief Officer who introduced source to the Chief Radio Operator. They all went to the Radio room where the Chief Officer left source. The Operator spoke some English, but source had difficulty communicating with him on any subject not common to both of them.

3. Source inspected the equipment in the Radio room, on the bridge, the public address room, the battery room, the emergency generator room, the antenna installation and a television set in the crew lounge. Comments on each phase of the inspection are as follows:

(a) RADIO ROOM. During inspection of the Radio room, the Operator demonstrated the semi-automatic electronic key. Source pointed to the key, then to the tape recorder, then to a small unit (8" by 8" by 8" box with meter and other controls) which he took from a drawer under the spare receiver, then to the HF transmitter (BLESNA KWM). He then demonstrated by feeding a tone from the semi-automatic electronic key to the recorder and recorded a short transmission of V's, call sign, etc. He flipped this back at normal speed (rcording speed) and then by putting a small metal tube (approximately ¼ inch diameter - 1½ inches long) over a spindle (right side of recording head) he changed the gear ratio and speeded the recorder. When flipped back, the code came out at a very fast rate. There was another spindle on the left side of the recording head. The tape was going from the left reel to the right reel when he used the tube on the right spindle to speed up the recorder. He again pointed to the tape recorder, then to the small unit from the drawer, then to the HF transmitter indicating that the high speed code was transmitted this way. Source presumed that the same system is used for receiving high speed code.

SKETCH FOLLOWS:

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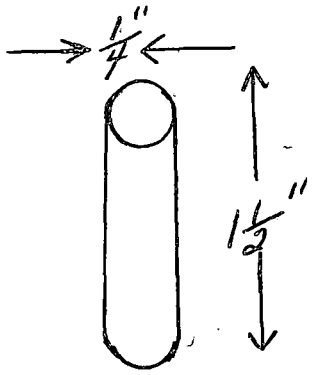
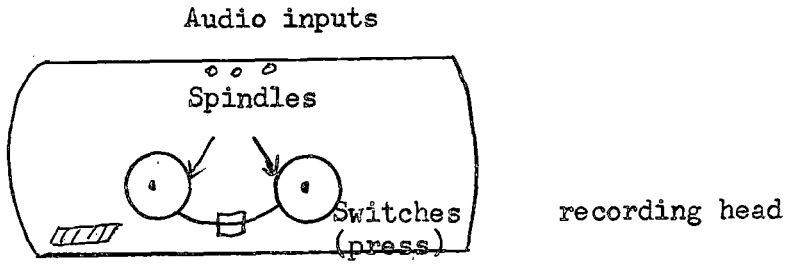
(KOMMUNARSK Electronic Report
15-16 August, 1966)



Speed change tube



Tape recorder

4. Source tried sending with the semi-automatic electronic key, but as Source could not control it at the speed it was set for, he slowed down both the dot and dash rate for source.

5. The key mounted in the centre of the operating position is a home made side movement key (made from spring steel or saw blade) and could be used as a second key for controlling the semi-automatic key unit. The key by the reserve equipment is a standard hand key. (See APPENDIX "A").

(b) THE BRIDGE Source inspected the DF, Auto Key and Radar on the bridge and later, when inspecting the antennas, source asked about the starboard mounted VHF antenna (7), and was taken back to the bridge and showed source the remote control unit of the AKA/SIA Radiotelephone mounted beside the remote control for the STORNO VHF radiotelephone. When he asked about the frequencies utilized, he opened a door to the right of the remote units and the AKA/SIA unit was mounted inside. Source read the frequencies, 122.5, 126.25, 125.0 and 132.0 Mc/s on 4 round crystals installed. The Operator then indicated that this unit was different from the STORNO unit in that this one was amplitude modulated. (See APPENDIX "B" for layout).

(c) THE PUBLIC ADDRESS ROOM. This room contained a large broadcast-type receiver in wooden case, a tape recorder, a rack containing;

1) VOLNA-K receiver,
2) six audio amplifiers,
3) meter panel, and
4) switch panel and

a unit which source understood to be an amplifier for a directional deck speaker. There was also a large drawer full of tapes under the tape recorder and source understood that this was the entertainment centre of the vessel. The audio amplifiers are for /a speaker

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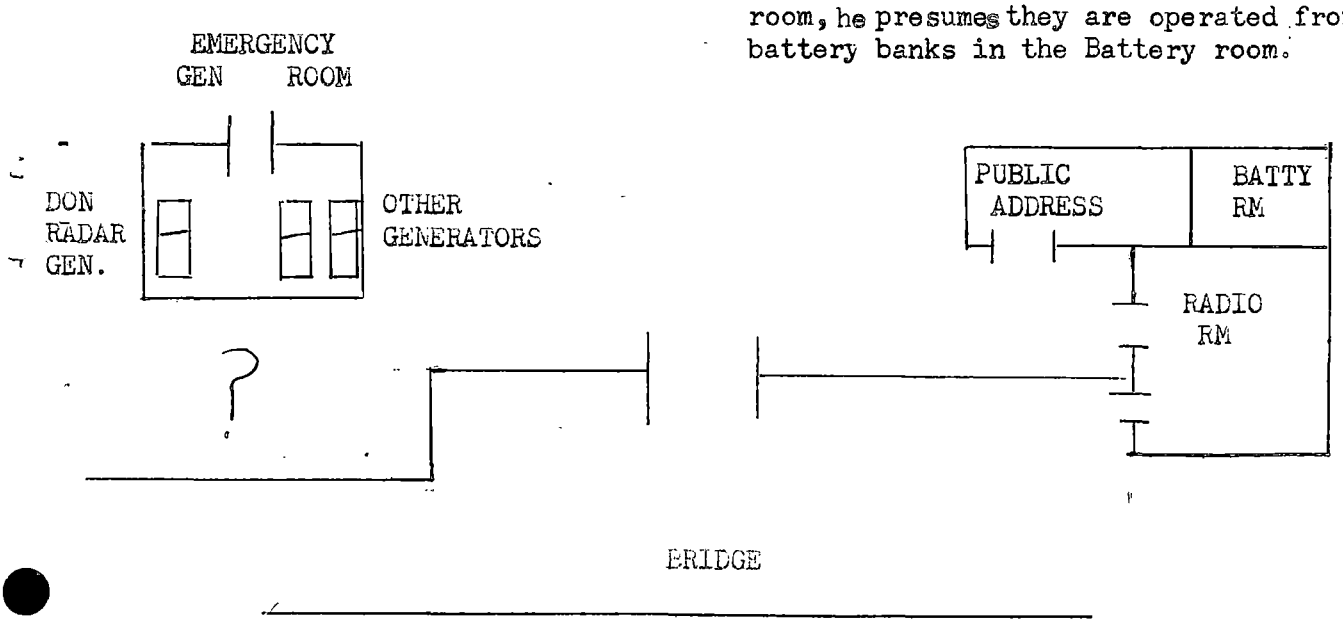
a speaker system throughout the ship. They have at least two transistors (power transistors) and pull out individually. The transistors are mounted in heat sinks and if source remembers accurately, the operator said that they were 20 watt units. See APPENDIX "C".

(d) THE BATTERY ROOM. Source is not sure of the exact location of the battery room, but source thinks it is just aft of the Radio room. It contained a number of banks of batteries (well kept). Source got information on two of the banks as follows;

(1) Type 10-KN-60M is a bank of 2 v cells, total voltage 12.5 v., Amp./hour capacity of this type is 60. Two of these are for the DF unit, giving a total of 25 v,

(2) Type 5-KN-100M is bank of 2 v cells totalling 6.25 v. Four of this type are used to give 25 v, for reserve equipment and auto-alarm. The 100M designates 100 Amp/hour capacity.

(e) THE EMERGENCY GENERATOR ROOM. This room is located on the starboard side approximately the same position as the Battery room on the portside. It contained three motor generators and many power panels and other units. One of the generators is for the DON radar and the other two are for other equipment. As he did not notice batteries in this room, he presumes they are operated from the other battery banks in the Battery room.



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(KOMMUNARSK Electronic Report
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GENERAL COMMENTS

6. The TV set in the crew lounge looked like a normal 21 inch set in a wood cabinet. Source was told that it was made in Russia with the exception of the picture tube which was made in Holland. He asked if they had watched the local Churchill station and was told "No", but was asked what the channel number was (Source did not know if this set is compatable with American television).

7. The Operator pulled a VOLNA-K receiver out of its case for source and it was a well made tube set. When source asked if it used any transistors he said "very little". From this, source assumed that it may utilize semi-conductor diodes.

8. The Operator said that it had taken ten days to come from Cuba to Churchill.

9. When Source enquired about the useful range of the DON radar, he did not understand Source and Source did not press the point further. (Range switch marked for .8, 2.5, 5, 15, 30, 50 miles).

10. Source asked the Operator how the trip to Churchill was and he said not very good conditions in Hudson Strait because of ice and fog. He followed up with the comment that not many Russian ships would be coming to Churchill because of the ice and poor visibility in the Straits. He said that probably three or four Russian ships a day would go to our east and west coast ports but not to Churchill.

11. He said that the KOMMUNARSK was a nice ship and only two years old and that she was built in Finland.

12. The Operator said that the power of the DON radar was 80 KW and then later corrected this (by referring to Russian radio licence) to .05 KW. Source did not understand this change, but the 80 KW may be effective radiated power or Peak Pulse Power, while the .05 KW may be power consumption or average DO input to final stage.

Date of Report: 7 November 1966
Source: DGI/INT S

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(KOMMUNARSK Electronic Report
15-16 August, 1966)

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APPENDIX "A"

RADIO ROOM

The equipment, starting at the left end of operating dish and going around the room, is as follows:

(1) Spare VOLNA-K receiver -- not hooked up or mounted (tied down with rope),

(2) Tape recorder,

(3) BLESNA-KWM HF transmitter,

(4) Semi-automatic keyer unit and key (electronic key),

(5) VOLNA-K HF receiver,

(6) Centre of operating position -- side movement key (home-made)-- wall clock -- remote control for STORNO VHF radiotelephone (a second remote control is on bridge) -- antenna patch coord panel -- large knife switches on ceiling,

(7) VOLNA-K MF receiver,

(8) BLESNA-SW main transmitter,

(9) ASP-4 reserve transmitter on tip and PAS-2M reserve receiver mounted below,

(10) Window to bridge for direct communication (telephone unit on top of VOLNA-K HF receiver and another one under desk to left of operator's chair),

(11) STORNO VHF radiotelephone mounted on wall behind operating position,

(12) APM-54P auto-alarm receiver mounted on wall beside STORNO,

(13) Couch,

(14) Typewriter.

SKETCH FOLLOWS.

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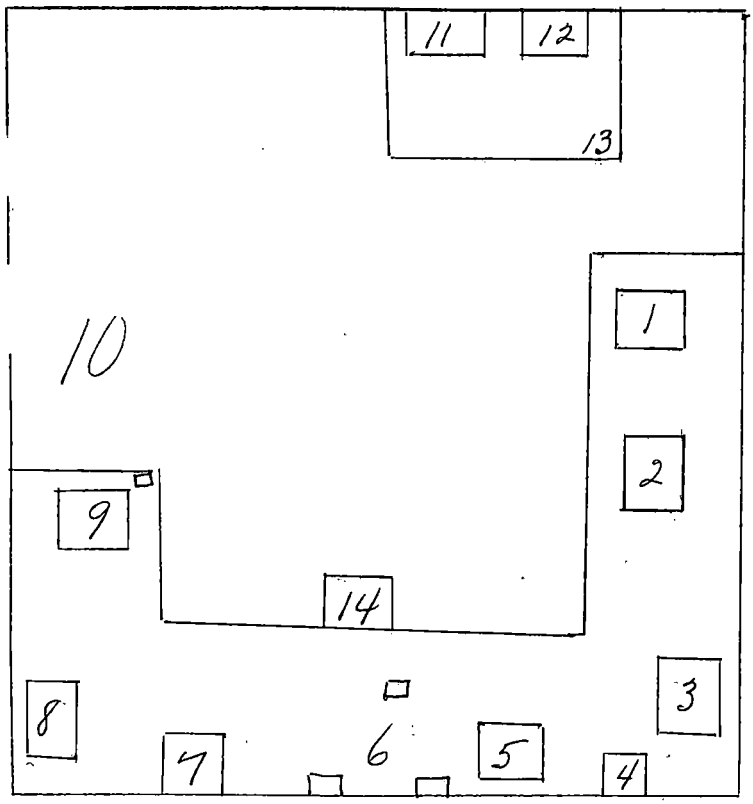
SKETCH FOR APPENDIX "A"



RADIO ROOM

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(KOMMUNARSK Electronic Report
15-16 August, 1966)

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APPENDIX "B"

LAYOUT OF BRIDGE EQUIPMENT

Location of Bridge equipment is as follows;

(1) Auto-key (APSTB-1M),

(2) DF receiver (C. PLATH GMBH),

(3) Depth finder (location may be incorrect),

(4) STORNO radiotelephone remote control,

(5) AKA/SIA radiotelephone remote control,

(6) AKA/SIA unit in closet,

(7) Pen-recorder unit,

(8) Pen-recorder unit,

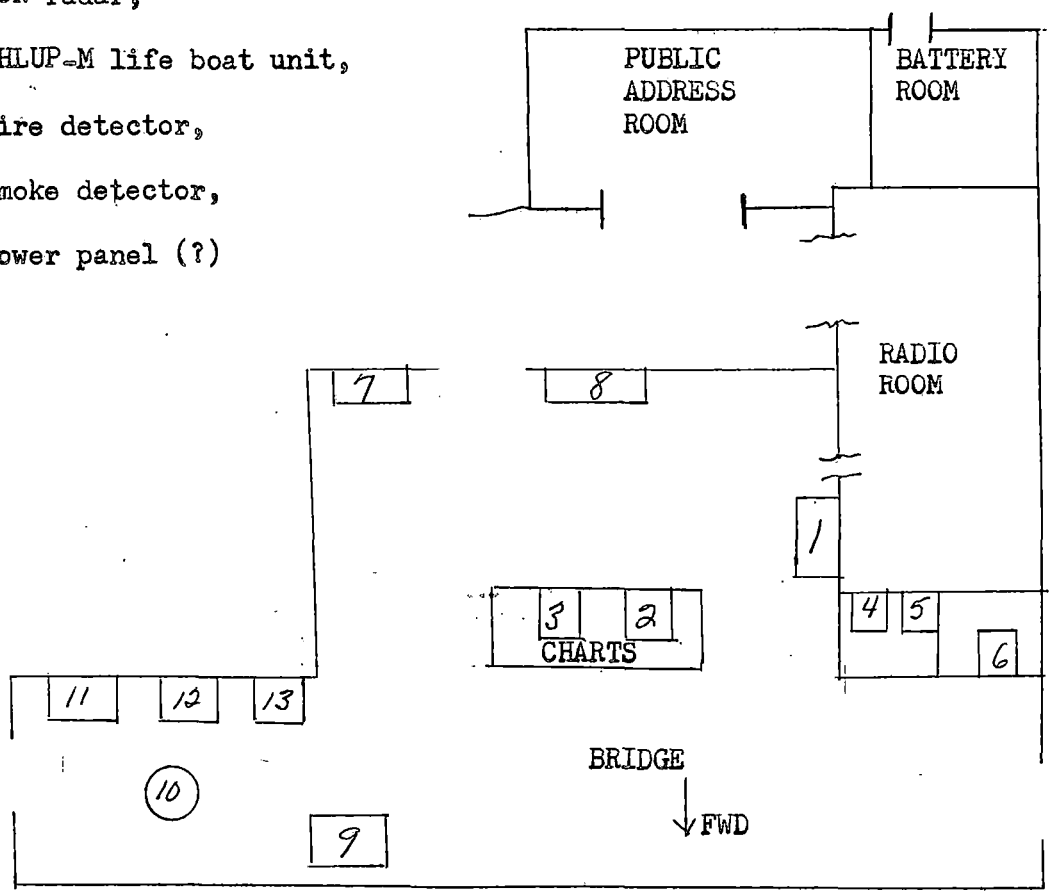
(9) DON radar,

(10) SHLUP-M life boat unit,

(11) Fire detector,

(12) Smoke detector,

(13) Power panel (?)



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(KOMMUNARSK Electronic Report
15-16 August, 1966)

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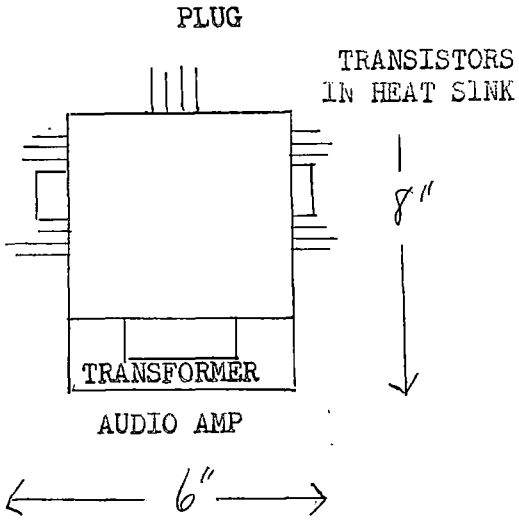
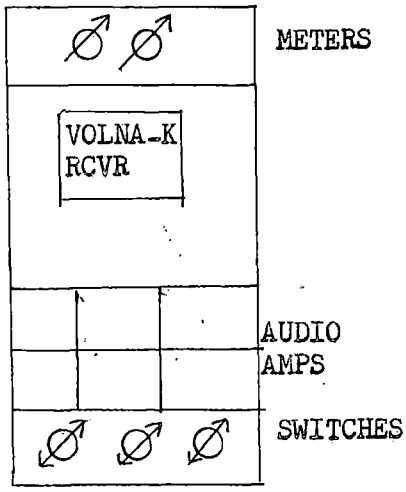
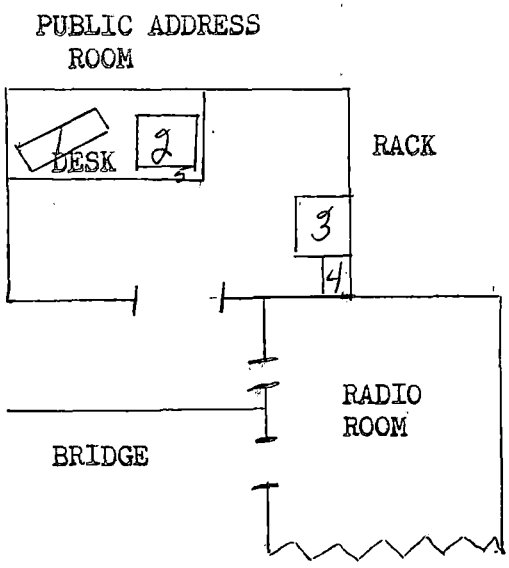
APPENDIX "C"

PUBLIC ADDRESS ROOM







(1) Large broadcast-type receiver

(2) Tape recorder,

(3) VOLNA-K receiver & audio amp. rack,

(4) Deck speaker amplifier,

(5) Drawer under tape recorder containing many tapes

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(KOMMUNARSK Electronic Report
15-16 August, 1966)

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APPENDIX "D"

ANTENNA INSTALLATION

The antennas installed are:

(1) Radar - narrow slot type on top of mast above bridge,

(2) DF fixed loops halfway up mast on forward side,

(3) VHF co-ax type on port wing at top of mast (used on STORNO VHF radiotelephone).

(4) VHF vertical dipole ( )? on starboard wing at top of mast (used on AKA/SIA radiotelephone),

(5) Doublet (approximately 8 metres long) sloping down from mast to starboard side - used for receiving,

(6) Cage type (approximately 8 metres long) sloping down from mast to starboard side - used for receiving,

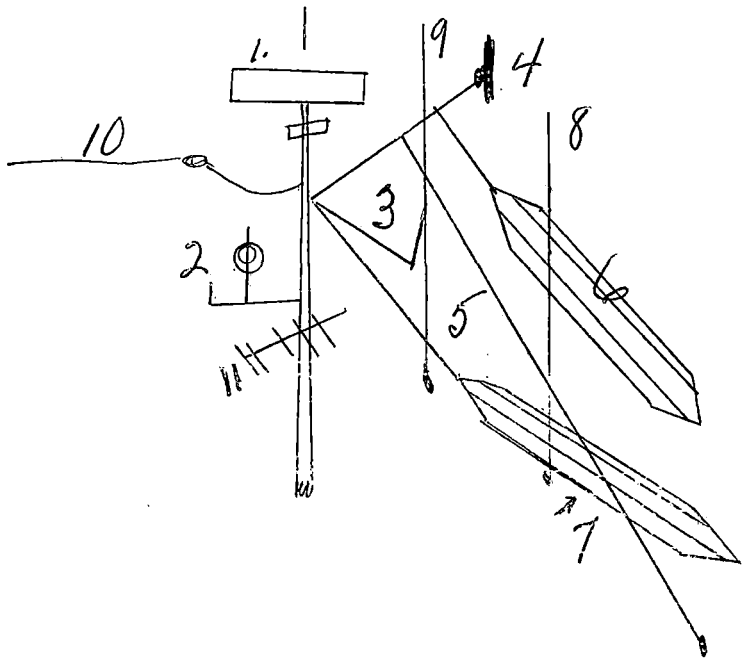
(7) Cage type sloping down from mast to port side (approximately 20 metres long) - reserve antenna,

(8) Whip antenna, port side above bridge for HF transmitter,

(9) Whip antenna, starboard side above bridge for HF receiver,

(10) Main antenna, (taken down at time of inspection for loading), but is 60 metres long and runs forward from bridge mast,

(11) YAGI type, 4 element, for television receiver (approximate size for channel 2-6). Mounted on starboard side above bridge on short post.



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(KOMMUNARSK Electronic Report
15-16 August, 1966)

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APPENDIX "E"

MAKE	MODEL/SERIAL	FUNCTION	FREQUENCY	POWER KW
TRANSMITTERS				
BLESNA SW	0908	Main	(115V 427W) 365-550 Kc/s	250 W
ASP-4	N-16	Reserve	(24V BATTERY) 515-410 Kc/s	20 W
BLESNA KWM	0989	A1 A2 A3 HF	(115V) 2840 Kc/s 22720 Kc/s	250 W
STORNO (DENMARK)	Serial-10680 CQF 13-2	FM VHF RT	Int. CH 1-28 152-174 Mc/s	20 W
DON (made 1963)	30261	Radar	Range .8,2.5,15,30, 50 miles - 3 cm (380 V AC)	.05/80 KW
AKA/SIA	640041	AM-VHF RT	122.5,126.25,125.0, 132.0 Mc/s	5 W
APSTB-1M	1224	Auto-Key	(24V BATTERY)	-----
RECEIVERS				
PAS-2M	3063	Reserve	(24V BATTERY) 380-600 Kc/s (continuous tuning) except 100-175 Kc/s not covered.	
(127 or 220V AC) VOLNA-K	196410736	Main	12 Kc/s-23 Mc/s (continuous tuning)	
VOLNA-K	19612147	HF	Same as above (24V BATTERY or 220V AC)	
APM-54P	1056	Auto-Alarm	500 Kc/s	
STORNO (DENMARK)	CQF 13-2	VHF RT	152-174 Mc/s (INT CA 1-28)	
C. PLATH	GMBH	DF	240-535 Kc/s	
LIFEBOAT APPARATUS				
SHLUP-M	47	Transmit and Receive 500 Kc/s and 8364 Kc/s		

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(KOMMUNARSK Electronic Report
15-16 August, 1966)

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APPENDIX "E" Cont.

TRANSMITTING FREQUENCIES

410, 425, 454, 468, 480, 500, 512 Kc/s (Main and Reserve both); International VHF channels 1 to 28 (152-174 Mc/s) (except CH 15 and CH 17 not fitted) FM; Continuous coverage 2840 Kc/s to 22720 Kc/s A1 A2 A3; 122.5, 126.25, 125.0, 132.0 Mc/s AM; 3 CM radar.

BATTERIES (three motor generators - one for radar and two for other equipment).

DF - type 10-KN-60M (two at 12.5 V for 25V) 60 AMP/HOUR each; Reserve/Auto-alarm - type 5 KN-100M (4 at 6.25V for 25V), 100 AMP/HOUR each; also several other battery banks.

ANTENNAE

Main	-	60 metre long wire	(mast to mast)
Reserve	-	cage - 20 metre long	(port side)
Receive	-	cage - 8 metre long	(starboard side)
HF transmit	-	whip	(port side)
HF receive	-	whip	(starboard side)
Radar	-	thin slot type	(mast top above bridge)
Receiver	-	doublet - 8 metres	(starboard side)
DF	-	fixed loops	(forward of Radio mast halfway up)
TV	-	4 EL YAGI	(starboard side)
VHF RT	-	(STORNO CO-AX type	(port wing of mast)
VHF RT	-	(AKA/SIA) doublet	(starboard wing)

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X. U.S.S.R.

SHIPPING - Electronic Report
Soviet Mership KRASNOGRAD
27 August, 1966

1. The Soviet Mership KRASNOGRAD (GRT 9200) (Callsign not known) arrived with the KRASNOJE SELO off the mouth of the Churchill River at 5 p.m. CDT, 27 August, 1966.

2. Source went on board the KRASNOGRAD 2:30 p.m., 6 September and met the Captain. The Captain introduced him to the operators. One operator was very helpful, while the other was very restrictive. He had the feeling that he was not very welcome on board the ship.

3. Source did not see an electronic key and as two normal hand keys were fitted an electronic key may not be carried. The tape recorder carried is different than others he have seen, it is larger and has a remote control mounted on the operating position. (Model Recorder M-64.)

4. The AKA/SIA VHF AM Radiotelephone unit is mounted in the Operating room and is fixed in a tubular frame much like a military tank set. The Operator indicated that source was not concerned with this unit.

5. He did not get in the Public Address room, but noticed through the open door, a rack with audio amplifiers the same (or similar) as on the KOMMUNARSK.

6. Two TV set are carried, but he did not see them. Source understood the Operator to say that the Russian set would receive our TV stations but not the British stations, as different frequencies are used in England.

7. The Radio transmitter is located in a room in the fore part of the funnel on the starboard side, together with two motor generators for radio equipment. The Battery room is on the port side of the funnel.

8. The Radar scope unit was tilted back and he could not see the plate on top showing the year of manufacture.

9. The Operator indicated that the A-670 receiver was very good --- better than the VOLNA-K receivers. It is a much larger and newer looking receiver. (For equipment see APPENDICES "A", "B", "C", "D".)

Date of Report: November 7, 1966
Source: DGI/INT S

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(KRASNOGRAD Electronic Report
27 August, 1966)

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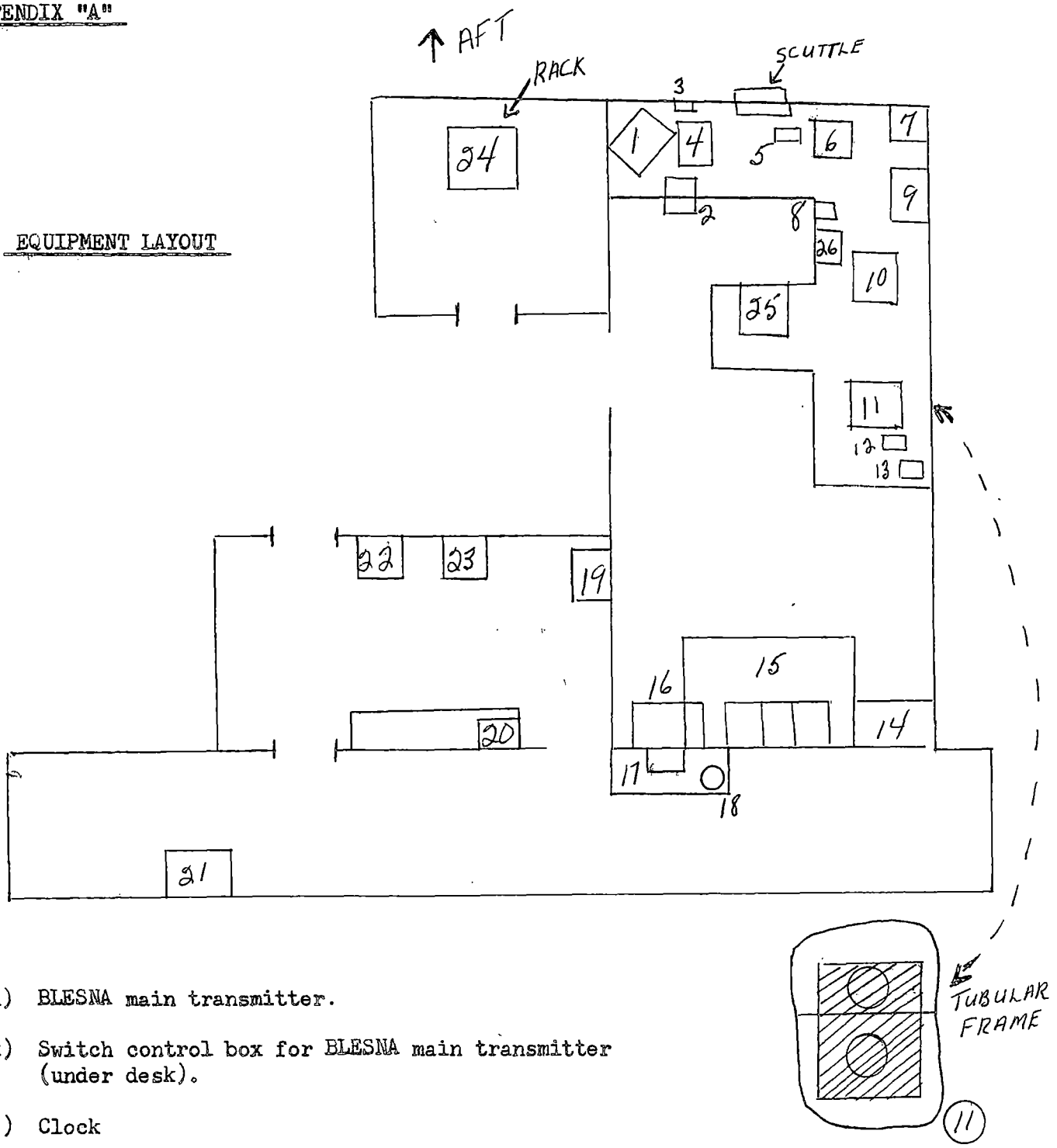
APPENDIX "A"

EQUIPMENT LAYOUT



(1) BLESNA main transmitter.

(2) Switch control box for BLESNA main transmitter (under desk).

(3) Clock

(4) VOLNA-K main receiver.

(5) Remote control for tape recorder.

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Appendix "A" continued

(6) VOLNA-K receiver

(7) Reserve transmitter and receiver.

(8) Switch control box for BLESNA HF transmitter (under desk).

(9) BLESNA HF transmitter.

(10) Tape recorder.

(11) AKA/SIA VHF RT (AM)

(12) Remote control for AKA/SIA transceiver.

(13) Remote control for standard electric VHF radiotelephone.

(14) Power panels.

(15) Standard electric VHF transmitter/receiver/power supply.

(16) APM-54P auto alarm receiver.

(17) Remote control for standard electric VHF RT (on Bridge).

(18) SHLUP lifeboat equipment under desk.

(19) APCTB-1M auto-key.

(20) CRP-5 direction finding receiver.

(21) DON-2 radar scope unit.

(22) Pen recorder.

(23) Pen recorder.

(24) Audio amplifier rack.

(25) A-670 receiver.

(26) Typewriter

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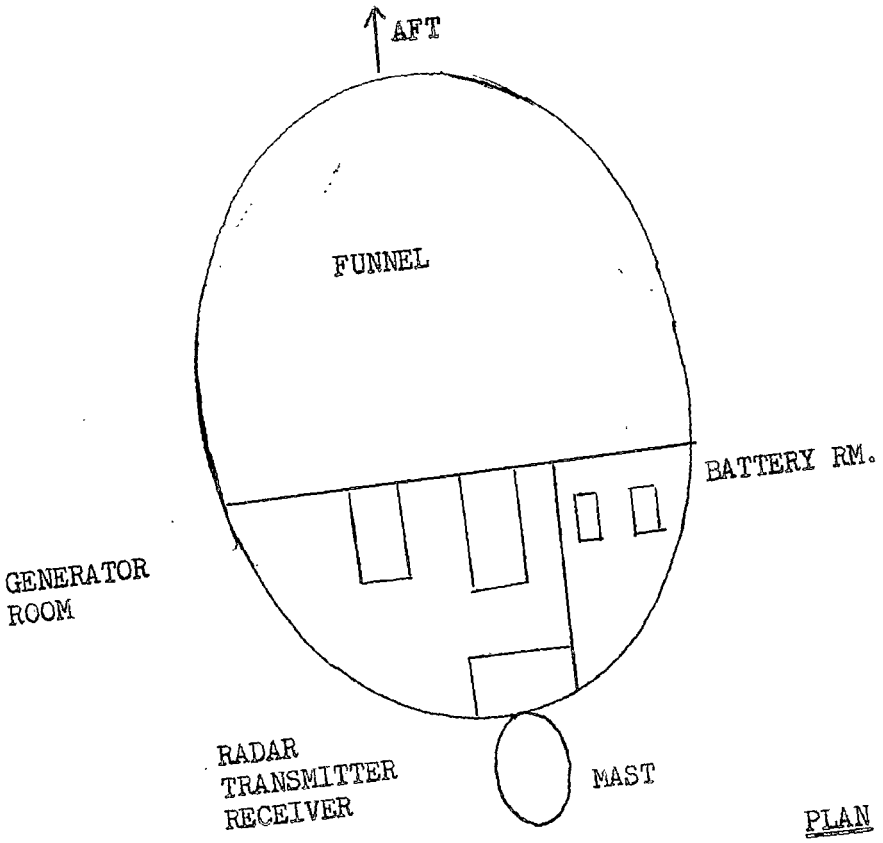
(KRASNOGRAD Electronic Report
27 August, 1966)

APPENDIX "B"

BATTERY ROOM
AND RADAR GENERATOR ROOM LOCATION



PLAN

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(KRASNOGRAD Electronic Report
27 August, 1966)

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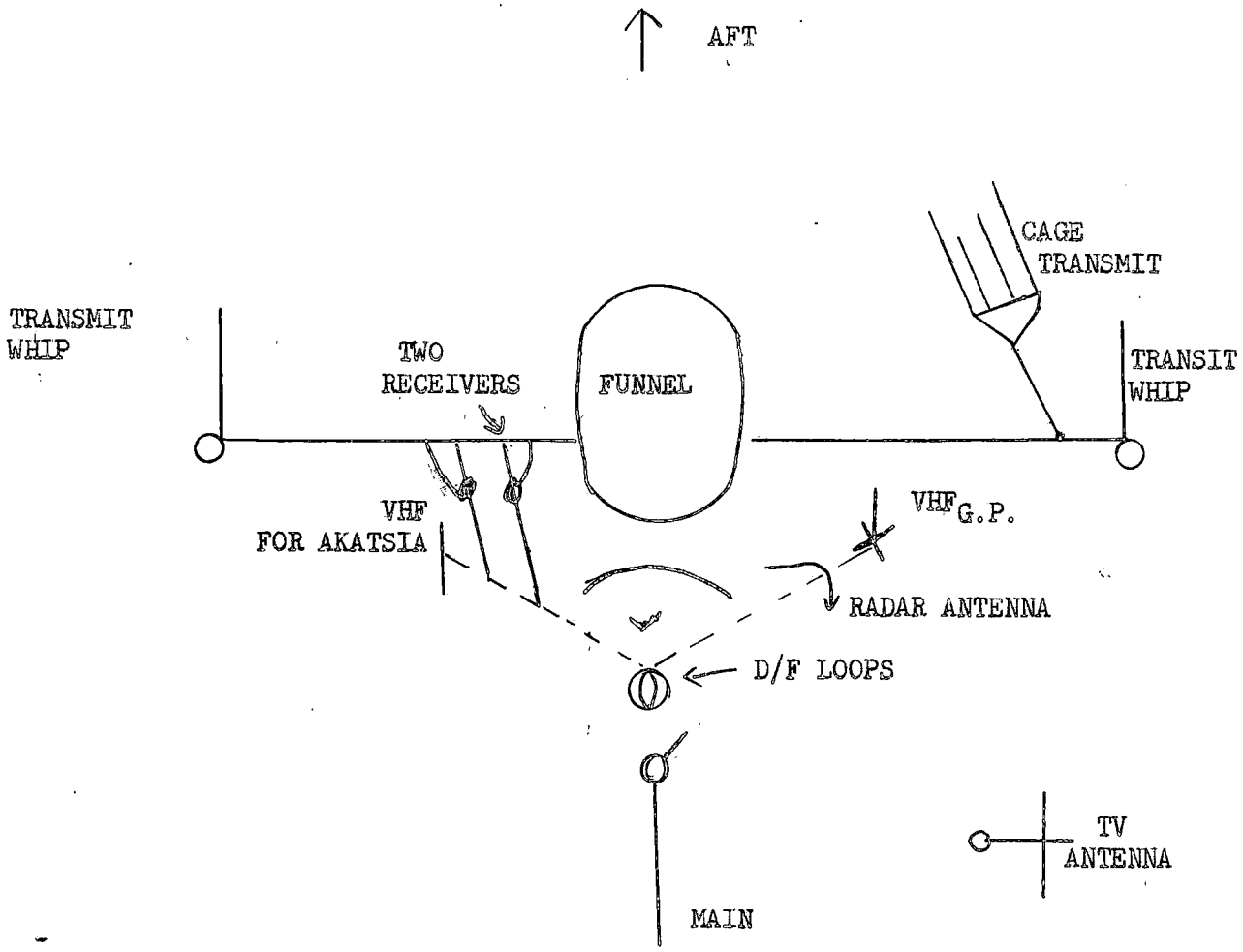
APPENDIX "C"

ANTENNA LOCATIONS



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APPENDIX "D"

MAKE	MODEL SERIAL	FUNCTION	FREQUENCY RANGE	POWER KW
TRANSMITTERS				
BLESNA	0623	Main	365 - 550 Kc/s	250 W
BLESNA	0568	HF	2840 - 22720 Kc/s	250 W
ACP	935	Reserve	568,600,625,641,661, 706,732 meters ?	60 W
Standard Electric (DENMARK)	CCU9542 Trans.) CCU9582 RCVR.) CCU9541 Power)	VHF RT	International CH.6-27	20 W
APCTB-1M	598	Auto-Key	(operator said same as for KRASNOJE)	
DON-2		Radar	3.2 CM	85 KW
- AKA/SIA		VHF RT AM	122.5,126.25,125.0,132.0 Mc/s	

- Name and frequencies not given to source, but it is identical to the AKA/SIA unit in KOMMUNARSK

RECEIVERS			
PAC-2		Reserve	380-600 Kc/s
A-670	0172460364	HF	1.5 Mc/s - 25 Mc/s
VOLNA-K (made 1961)	19611770	Main	12 Kc/s - 23 Mc/s
VOLNA-K (made 1961)	19611749	HF	12 Kc/s - 23 Mc/s
APM-54P	1162	Auto-Alarm	500 Kc/s
CRP-5	01-6389-2-61	DF	186-376 Kc/s & 375-750 Kc/s
- Standard Electric	See Transmitter	VHF RT	Int. CH. 6-27

LIFEBOAT APPARATUS	
SHLUP	500 Kc/s - 8364 Kc/s

TRANSMITTING FREQUENCIES

410, 425, 454, 468, 480, 500, 512 Kc/s; International CH 6-27; 2840 Kc/s - 22720 Kc/s continuous.

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APPENDIX "D" Cont.

BATTERIES FOR RADIO

10 Batteries in two banks - marking on one battery was; 6.25V SKH-100M.

TAPE RECORDER

Model M-64 (different than the type on KOMMUNARSK and KRASNOJE SELO)

ANTENNAE

Main	-	runs forward.
Radar	-	slot type top of mast.
VHF RT	-	VHF ground plane, port (standard electric unit)
DF	-	fixed loops, forward side of mast.
VHF RT	-	VHF (for AKA/SIA unit) starboard.
Receive	-	Whip starboard side. or?
Receive	-	2 doublets starboard (short wire antenna).
Transmit	-	Whip port side.
Transmit	-	(medium wave and short wave) cage on port side.
TV	-	1 element on boom fixed on port side.

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XI. U.S.S.R.

SHIPPING - Electronic Report
Soviet Mership KRASNOJE SELO
29 August, 1966 - 6 September, 1966

1. The KRASNOJE SELO (GRT 9269)(Callsign UNVS) arrived with the KRASNOGRAD off the mouth of the Churchill River at 5 p.m. CDT, Monday 29 August, 1966, and dock early on the morning of 6 September, 1966.

2. Source went on board at 10 a.m. CDT, 6 September, met the Captain and was introduced to the Radio Operator, who did not speak much English. Two radio operators from the KRASNOGRAD were also on board during the inspection.

3. Several times during the inspection the radio operator discussed something with the Captain and the Captain shook his head, as if to say no, once concerning the AKA/SIA VHF AM Radiotelephone, and then said that this unit was for private use to talk to other Russian ships only, that source was not interested in it. Another time seemed to concern the Public Address room and he was probably referring to the receiving equipment and audio amplifiers. He did not show the Public Address room. The Captain kept the inspection to equipment fitted under International Regulations.

4. The equipment installation (Radio Room, Bridge and Battery Room) on this ship is almost identical with the KOMMUNARSK. The Captain said the ship was one year old.

5. During inspection of the Radio Room, the Captain mentioned that the first four numbers in the number of the VOLNA-K receivers were the year of manufacture.

6. He said that there were two TV sets on board (not seen), one for Russian TV and the other for American TV.

7. The Radar Transmitter unit is located in a room on the forward side of the funnel, but he did not show source this room, just indicated where the radar was, pointing out the wave guide and a sign above the door in Russian which he said was Russian for Radar Room.

8. The Battery Room was the same as on the KOMMUNARSK, but source did not get the chance to take down battery types.

9. The Captain's English spelling of some equipment types differs from that of the operator on the KOMMUNARSK (C instead of S).

10. The Radio Room is almost identical with the KOMMUNARSK; however, source did not see the electronic key but presume one is used as two side movement hand-keys were mounted on the operating dish. The tape recorder looked the same as the one on the KOMMUNARSK, (the type which, when the top is fitted, becomes portable).

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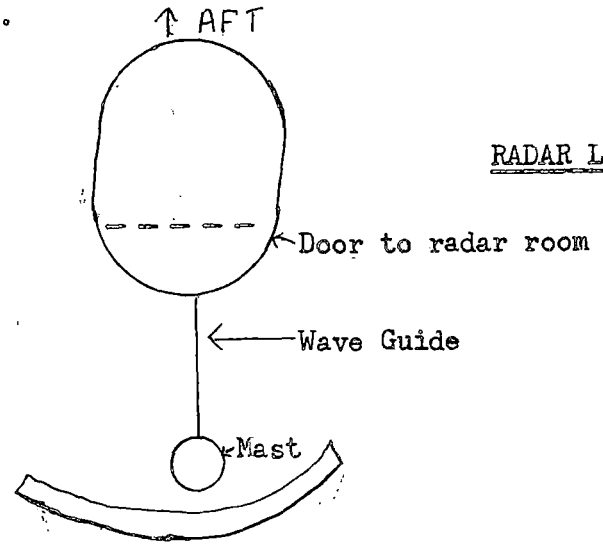
11. The antennae installation appears to be identical to the installation on the KOMMUNARSK.



RADAR LOCATION

12. When inspecting the Bridge Source asked the make and model of the radar, and managed to get a look at the plate on top of the scope unit, which indicated that it was made in 1964. Captain got source the frequency of 3.2 CM and 85 KW power from a small booklet.

13. While the Captain said that the AKA/SIA unit was for Russian inter-ship communication, the frequencies installed in this unit on board the KOMMUNARSK appear to be in the Aeronautical mobile band.

Date of Report: 7 November 1966

Source: DGI/INT S

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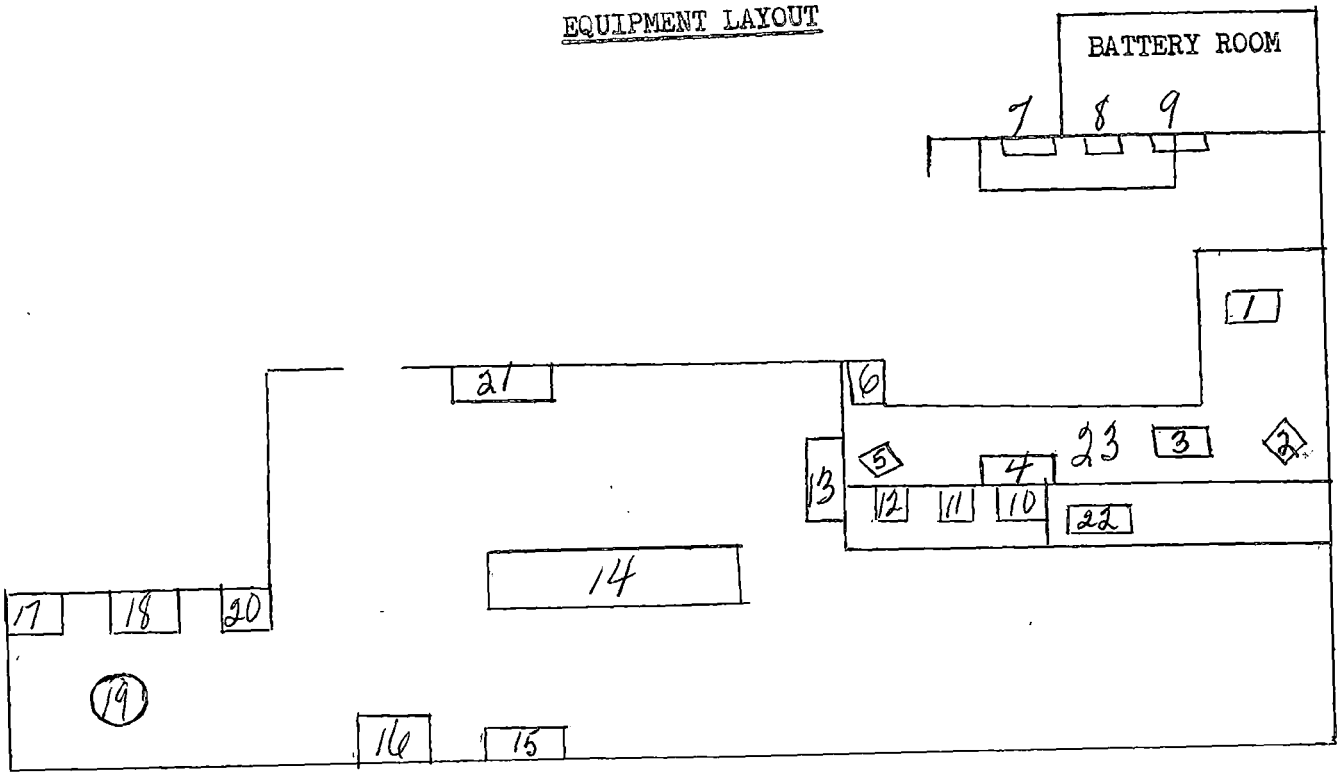
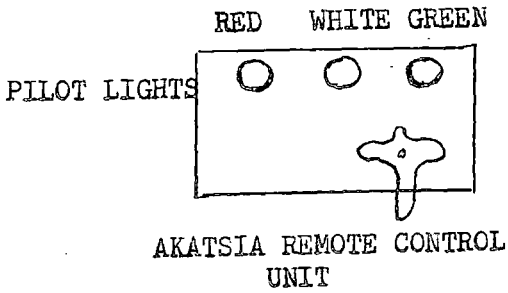
APPENDIX "A"

EQUIPMENT LAYOUT





(1) Tape recorder
(2) BELSNA HF transmitter
(3) VOLNA-K receiver
(4) VOLNA-K receiver
(5) BELSNA Main transmitter
(6) Reserve transmitter and receiver
(7) STORNO VHF transceiver
(8) Auto-Alarm receiver
(9) Power Panels
(10) Remote Control for AKA/SIA Radiotelephone
(11) STORNO VHF RT remote control
(12) Ship's intercommunication control (5 speakers throughout ship and one spare position).
(13) Auto-Key
(14) C. PLATH DF receiver
(15) Deck speaker control
(16) DON Radar (scope unit).
(17) Fire Detector (made in Sweden)
(18) Smoke Detector
(19) SHLUP-M portable lifeboat unit
(20) Depth gauge (circular dial non-recording).
(21) Chart recorder (possibly recording depth gauge).
(22) AKA/SIA transmitter and receiver unit in closet.
(23) STORNO VHF RT remote control, clock, antenna patch panel.

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(KRASNOJE SELO Report
29 August, 1966 - 6 September, 1966)

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APPENDIX "B"

MAKE	MODEL OR SERIAL	FUNCTION	FREQUENCY RANGE	POWER KW
TRANSMITTERS				
BLESNA	0963	Main	365-550 Kc/s	250 W
ACP-4	N106	Reserve	410,425,454,468,480 500,512 Kc/s	60 W
BLECNA	No.1087	HF	2840-22720 Kc/s	250 W
STORNO	11029	Combination	152-174 Mc/s	
	CQF-13-2	VHF RT	INT.CH. 1 to 27	20 W
APCTB-1M	1218	Auto-Key	-----	------
DON (made 1964)		Radar	3.2 CM	85 KW
- AKA/SIA	----	Combination VHF RT	122.5, 126.25, 125.0, 132.0 Mc/s	

- Name or frequencies not given to Source but he said it is identical to the AKA/SIA unit on KOMMUNARSK.

RECEIVERS				
VOLNA-K (Made 1964)	196411812	Main	12 Kc/s to 23 Mc/s	
VOLNA-K (Made 1964)	196411717	HF	12 Kc/s to 23 Mc/s	
PAC-2	2761	Reserve	380-600 Kc/s	
STORNO	11029	Combination		
	CQF-13-2	VHF RT	INT.CH. 1-27 (152-174 Mc/s)	
C. PLATH	GMBH	DF	240-535 Kc/s	
APM-54P	137	Auto-Alarm	500 Kc/s	
LIFEBOAT RADIO APPARATUS				
SHLUP-M	167		500 Kc/s & 8364 Kc/s	

TRANSMITTING FREQUENCIES

410, 425, 454, 468, 480, 500, 512 Kc/s; 2840 to 22720 Kc/s continuous; international VHF channels 1 to 27

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APPENDIX "B" Cont.

ANTENNAE

Radar	-	Slot type top of mast over Bridge.
DF	-	Fixed loops halfway up mast forward side.
HF Trans.	-	Whip mounted on port side
VHF RT (FM)	-	VHF Co-axial type on port side.
Main	-	Runs to forward mast
Reserve	-	Cage port side.
Receive	-	Cage starboard side (private use)
Receive	-	Whip starboard side (private use)
Receive	-	Doublet starboard side.
VHF RT (AM)	-	Starboard wing (AKA/SIA - private use) (for Russian ship to ship).
TV	-	YAGI antennae on port side.

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THE CURRENT ECONOMIC SITUATION IN RUMANIA

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THE CURRENT ECONOMIC SITUATION IN RUMANIA

Object

1. To analyse recent trends in the Rumanian economy, outline development problems and forecast economic trends which indicate trade patterns of possible interest to Canada.

Summary and Conclusions

2. The rapid post-war growth of the Rumanian economy and the independent posture assumed by Rumania in economic and political affairs has resulted in increased demands for sophisticated capital goods and technical know-how of a standard obtainable only from Western suppliers. Over the Six-Year Plan period (1960-1965), the continued restructuring of the Rumanian economy through preponderant investment allocations to heavy industry has been reflected in the rapid growth of industrial production and productivity as opposed to almost negligible growth in agricultural output. The dramatic reorientation of trade towards Western Europe during this period and the growing importance of imported machinery and equipment in total investment indicate Rumania's determination to industrialize regardless of supply sources. Nevertheless, Rumania's current per capita G.N.P. remains the lowest among the East European countries and lags far behind Western levels. In order to sustain a high level of industrialization and investment, the Rumanian planners must continue to restrain consumption, provide incentives

/in high-priority

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in high-priority sectors and find ways of paying for increased imports from the West. Agricultural productivity must be raised significantly to generate surpluses not only to feed a growing urban population but for export purposes as well. It is anticipated that Rumania's economic growth will decelerate somewhat over the Five-Year Plan period (1966-1970) as the economy attains a higher stage of industrial development. However, certain key industries are planned to show rapid gains, and planned increases in the mechanization of agriculture and forestry might be expected to yield modest gains. Total trade turnover is planned to expand more slowly over the Five-Year Plan period as the increase of commerce with the West is balanced somewhat by a slowdown in trade with the U.S.S.R. and other East European countries. Rumania will be most interested in trade with countries willing to barter and extend long-term credit. Although Rumania appears to be competitive with Canada in world markets, the relative stages of development of the two countries appear to open up a number of trade possibilities.

Discussion

Recent Developments

3. General There are two major politico-economic reasons why Rumania appears to be, from a Western point of view, the most interesting potential

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trading partner of all East European countries:

(a) The "take-off" of the Rumanian economy from a natural resources base to the establishment of a rapidly-expanding industrial sector and the resultant demand for sophisticated capital equipment and technical advice.

(b) Rumania's apparent determination to pursue an independent economic and political policy in both domestic and foreign affairs. This attitude arises from fear of Soviet economic hegemony and possible relegation to the role of supplier of foodstuffs and raw materials, and has resulted in aggressive reorientation of trade towards the industrialized West.

4. Size In terms of population, Rumania is only slightly smaller than Canada and contains approximately 19.1 million at mid-1966, or just under 20 per cent of total East European population. Despite considerable post-war urbanization, about two-thirds of the population remain domiciled in rural areas. The Rumanian labour force is estimated to number approximately 11.45 million at mid-1966, of which 6.90 million or some 60 per cent are employed in agriculture as compared with a corresponding 9.5 per cent in Canada. The 1965 Rumanian G.N.P. at market prices is estimated to be US$ 14.1 billion (converted at U.S. purchasing power equivalents), which

/is 13 per cent

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is 13 per cent of the estimated total East European G.N.P. The shares of industry and agriculture in G.N.P. are roughly 45 and 25 per cent respectively. Per capita G.N.P. is approximately US$ 740 for 1965, the lowest level of all East European countries, excluding Albania, and compares with an estimated figure of US$ 2,560 for Canada. Gross fixed capital formation is estimated to be about US$ 3.8-4.0 billion in 1966, with about 55 per cent going to industry, 12 per cent to agriculture and 11 per cent to transportation and communications. According to Rumanian figures (at the official rate of exchange), total foreign trade turnover in 1965 amounted to $2,182 million, just over 9 per cent of total East European foreign trade. Of this total, trade with the communist countries accounted for 65 per cent. On this basis, 1965 foreign trade turnover amounted to approximately $115 per capita as compared with $810 per capita in Canada, and exports of some $1,100 million represented 7.8 per cent of G.N.P. as compared with corresponding figures of 10.0 per cent and 16.4 per cent for East Europe and Canada respectively. The 1965 imports of about $1,080 million, indicating an approximate import-export equivalence in total foreign trade, mask substantial deficits with certain Free World countries and a surplus of some $92 million with communist countries.

5. Rates of Growth During the Six-Year Plan (1960-1965), the average annual rate of growth of the Rumanian G.N.P. was 5.5 per cent as compared

/with corresponding

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with corresponding rates of 4.8 and 4.9 per cent estimated for the USSR and East Europe and the combined European NATO countries respectively. A net rate of population growth somewhat under 1 per cent per annum resulted in an average annual rate of growth in per capita G.N.P. of 4.8 per cent. It is uncertain to what extent this growth has been reflected in increased consumption, but in view of a reported average annual growth in gross fixed investment of over 12 per cent since 1959, it would appear that consumption gains have been modest. The Rumanian total labour force grew at less than 1 per cent annually over the period, a resultant of rates of 4.6 and -1.0 per cent in the non-agricultural and agricultural sectors respectively. As a rough measure of overall productivity, G.N.P. per member of the labour force rose from $950 in 1959 to $1,250 in 1965 (an average annual growth of 4.6 per cent), most of the gain being attributable to industry. Wage-earners apparently shared in this gain by benefitting from an average annual growth in real wages of 3.9 per cent. Aggregative growth in the economy was largely attributable to an estimated average annual increase of about 12 per cent in industrial production, with the most impressive gains coming from production of rolled steel, chemicals and electric power. Conversely, estimated agricultural production in Rumania declined absolutely over the 1959-1963 period and is now estimated to be only marginally above the 1959 level, a result of the combined effects

/of collectivization

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of collectivization and crop failures despite continued farm mechanization and increased use of scientific farming methods. As regards the remaining sectors of the economy, it appears that construction, transport and communications and retail trade have maintained constant shares in the Rumanian Net Material Product. According to Rumanian figures, total foreign trade turnover rose from $1,025 million in 1959 to $2,182 million in 1965, an average annual growth of 13.3 per cent. As regards the direction of trade, total turnover with the communist countries increased at an average annual rate of about 9 per cent as compared with a rate of 25 per cent with the Free World countries. Up to 1964, the growth of imports exceeded that of exports by about 4.5 per cent per annum, but a sharp reversal of the trend in 1965 provided Rumania with a favourable trade balance of some $25 million, the first surplus since 1960.

6. Structural Changes The impressive post-war expansion in the industrial sector of the Rumanian economy has been accomplished by allocating a preponderant proportion of investment to heavy industry, by restricting personal consumption and by requisitioning agricultural produce not only to feed the urban population but also for export to pay for imports of raw materials and capital equipment. The estimated percentage share of industry in Rumanian G.N.P. increased from a pre-war level of 13 per cent to 45 per cent in 1965, whereas the share of agriculture and forestry combined, declined from about 55 to 25 per cent over the same period. This dramatic

/reversal of

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reversal of roles was accompanied by wide variations from year to year in the composition of Rumanian agricultural output. However, it appears that over the Six-Year Plan period production of bread grains has gained relative to production of coarse grains and potatoes, and meat production has gained relative to production of dairy products. Within industry, the shares of light manufactures in industrial output have apparently declined as against increases in the shares of the heavy branches of industry (especially machine building, metal processing and chemicals). In addition, the relative shares of electric power and natural gas in total energy output have increased at the expense of the portions accounted for by coal and crude oil. The changing structure of Rumania's foreign trade reflects the industrialization drive of the post-war period. Although the basic composition of Rumanian exports has not altered spectacularly, with foodstuffs, raw materials and semi-manufactures continuing to account for the major portion, exports of machinery and equipment, almost negligible in the pre-war years, presently account for some 20 per cent of the total. The composition of total imports over the post-war period has changed such that the share of raw materials, machinery and equipment has climbed from 55 to over 90 per cent between 1938 and the early 1960's and over the 1959-1963 period the contribution of imports to gross fixed investment in machinery and equipment rose from 19 to about 60 per cent. The composition

/of trade with

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of trade with Western Europe changed significantly over the Six-Year Plan period as the predominance of Rumanian exports of oil products and other raw materials gave way to increased exports of food and tobacco. On the other side, imports of manufactured goods declined relatively as imports of machinery and equipment assumed primacy. The relatively mild alterations in the direction of Rumanian exports as compared with imports between 1960 and 1965 has resulted in significant changes in the balance of trade with respect to Western Europe and the communist countries. Whereas in 1960 Rumania's exports and imports were in rough equivalence in both trading areas, by 1965 a deficit of some US$ 77.2 million (at the official rate of exchange) was recorded with the Common Market and the U.K. combined as against a surplus of US$ 92.3 million with the communist countries.

Problems of Development

7. Industry Rumania's ability to sustain the remarkable pace of industrialization achieved during the Six-Year Plan is contingent on a reliable inflow of raw materials and capital equipment coupled with a continued supply of labour from the agricultural sector. The availability of raw materials is of particular importance in the growth of the metallurgical and metalworking industries. Although Rumania possesses a wide range of minerals including copper, lead, zinc, bauxite, iron ore and coal, it is not self-sufficient in most of them. Imports of iron ore and coke accounted for more than

/50 per cent

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50 per cent of Rumania's requirements in the early 1960's. The depletion of existing reserves and the cost of maintaining high levels of mineral production militate against continued rapid growth in this branch of the economy in spite of the relatively impressive gains achieved over the Six-Year Plan and the priority assigned to investment in this sector. Similar problems exist in the petroleum industry where high cost of exploration and a low Life Index of about 12 years have encouraged the redirection of investment towards the development of natural gas reserves and construction of electric power plants. The build-up of Rumanian capital stock depends not only on access to foreign supplies of machinery and equipment but also on the extent to which Rumania is able to maintain a high rate of investment by restricting the growth of per capita consumption. The maintenance of a wage/price-structure to effect this objective must be balanced by sufficient incentives to encourage increases in labour productivity. Another problem facing Rumanian planners is the chronic inability to complete investment projects according to schedule, thus immobilizing a considerable portion of the nation's capital stock. In 1964, the ratio of project completions to investment was 75 per cent as compared to a planned target of 80 per cent and a U.S.S.R. figure of over 95 per cent.

8. Agriculture The supply of labour for industry is related to the problem of raising agricultural productivity to allow the continued migration

/of labour

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of labour to industrial urban centres. The relatively slow growth in agricultural output per worker over the Six-Year Plan suggests that it will be difficult to achieve significant productivity gains without increased mechanization, wider use of fertilizers, increased specialization of crops and provision of incentives. Nevertheless, since 1961 the rate of mechanization has declined considerably, reflecting Rumania's efforts to export agricultural machinery, and the limited ability of industry to absorb surplus agricultural manpower.

9. Trade and Payments The dependence of Rumania's economic growth on access to foreign supplies of crucial raw materials and equipment means that high priority must be given to establishing markets for Rumanian exports to alleviate pressure on the payments position. The changing direction of Rumania's trade has led to a cumulative payments deficit in convertible currencies over the 1961-1965 period of an estimated $200 million. Table I in the Appendix presents figures for the 1961-1964 period. Discrepancies between Rumanian and Western statistics is explained partly by an undefined allowance for freight and insurance in Rumanian figures and partly by the inclusion of western merchanting as an import by Rumania. Demand for Rumanian products in the industrialized West is not substantial and, in any event, Rumanian exports face quantitative and tariff restrictions in the absence of most-favoured-nation treatment. Considerable improvement

/in the quality

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in the quality of Rumanian machinery, equipment and other manufactures is apparently necessary before acceptability is gained in Western markets. On the other hand, Rumanian exports of primary products face stiff competition on world markets and are subject to the price vagaries and inelasticities of demand on the international market. An expanding Rumanian urban population places increasing domestic demands on the production of foodstuffs and, in the absence of significant productivity gains, these products will become less available for export. There is some evidence that Rumania has used occasional gold exports to meet deficits with the West. A $20 million shipment to Switzerland was reported in 1965 in spite of the fact that in that year there were no new gold discoveries in Rumania and production amounted to some $13 million. Rumania has received a number of medium and long-term credits from Western Europe to finance purchases of capital equipment but has been subject to the general hesitancy of these countries to extend credit beyond 5 years' duration.

Forecast of Economic Development

10. General In spite of the so-called economic reforms introduced into the systems of other East European countries, there are no indications that such measures are contemplated for Rumania. Rather, it appears that the continuing commitment to rapid industrialization will result in tighter central controls over economic activities. For example, a policy of more

/centralized direction

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centralized direction of collective farm operations has been enunciated. Furthermore, Rumanian suspicion of economic co-ordination within CEMA is expected to strengthen this tendency. On the other hand, closer economic ties with other countries (e.g., joint hydroelectric project with Yugoslavia on the Danube River) are bound to provide some demonstration effects. In any case, the provisions of the new Five-Year Plan, 1966-1970, calling for a continuation of rapid industrialization, are cited as essential for ensuring Rumanian independence and national sovereignty. The attitude which the U.S.S.R. will take in the face of increasing Rumanian economic nationalism is uncertain, and the range of options open to it extends all the way from inaction to the imposition of sanctions. In general, over the 1966-1970 period it is anticipated that while Rumania retains close central control over all economic activities, further contacts will be established with Free World countries and international organizations (e.g., G.A.T.T., I.M.F., I.B.R.D.), but not without due regard to essential commerce with the U.S.S.R. and East Europe.

11. Internal Economy The slightly less ambitious goals set for the achievement of the Five-Year Plan as against the previous Six-Year Plan reflect the cautious optimism of the Rumanian planners. In most cases it appears that targets can be realized and average annual growth in G.N.P. should be about 5 per cent. Despite official concern regarding the very

/low birth rate,

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low birth rate, population is not expected to increase by more than 1 per cent per annum, thus G.N.P. per capita is forecast to increase at an average annual rate of 4 per cent. Annual investment is planned to increase by about 8.5 per cent per annum, suggesting that the consumer will likely benefit only from increased availability of particular durable items for which increases are planned (e.g., T.V. sets, washing machines, furniture). The high priority given to investment in the industrial sector (50-55 per cent of total funds as against 12 and 11 per cent to agriculture and transport and communications respectively) indicates a continuing change in the basic structure of the economy. Gross industrial and agricultural production are planned to increase at average annual rates of 11.5 per cent and 5-6 per cent respectively over the period. While industrial production might be expected to increase annually by about 9-10 per cent (assuming increased availability of foreign capital equipment and raw materials) planned growth in agricultural output seems unreasonable in view of the low investment allocation and past failures. A postulated growth of 2 per cent per annum in agriculture would lead to a 22 per cent share in projected G.N.P. by 1970 as against a 56 per cent share for industry. It is assumed that the other main sectors of the economy will retain about constant or gradually declining shares of G.N.P. Within industry, high priority is to be given to increased production from and investment in the chemical, electric power, machine-building, electronic and steel branches.

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Twenty per cent of total industrial investment is to be allocated to the chemical industry of which half is to be channelled into petrochemicals. Electric power production is expected to double between 1965 and 1970 as opposed to a planned average yearly gain in crude oil production of less than 1 per cent. This dramatic shift in the relative shares of energy output combined with a substantial investment allocation to crude oil and natural gas prospecting reflects the planners' wish to maintain or increase the Life Index of hydrocarbon resources. Despite the successes achieved by the Rumanian steel industry during the Six-Year Plan period and the optimistic predictions of self-sufficiency by 1970, shortfalls in domestic output of iron ore and metallurgical coke are expected to keep the plant at Galati dependent on foreign supplies. Steel output is planned to increase from 3 million metric tons in 1965 to 6.3 million by 1970. Output of lead, zinc and aluminum is expected to meet internal requirements over the Plan period and should be available for export by 1970. Production from the machine-building industry is to double by 1970 and it is planned that Rumania will be almost self-sufficient in machine tool requirements by the end of the period. The planners' optimistic targets for agricultural output probably reflect the need to increase the supply of exportable produce in payment for deliveries of foreign machinery and equipment. The Five-Year Plan calls for a 20 per cent yearly increase in the production of wheat and corn, further farm mechanization, crop specialization, improved livestock

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and land improvement through irrigation. Very little information is available regarding output of the timber industry but it is planned to increase mechanization of forestry operations with a view to increasing exports.

12. Trade and Payments Future trends in the direction, composition and volume of Rumanian trade will be influenced by a number of factors including:

(a) Political relations with and economic dependence on CEMA countries, particularly the USSR.

(b) Fluctuations in domestic agricultural output from year to year.

(c) Determination to develop the industrial sector by importing high quality machinery regardless of source.

(d) Western attitudes regarding extension of MFN treatment, exports of "strategic" goods, extension of long-term credits and diplomatic recognition.

(e) Reserves of convertible currencies and gold available to Rumania.

According to the Five-Year Plan total foreign trade turnover is to increase by about 9 per cent annually over the period as compared with a rate of 13.3 per cent over the previous plan period. Trade with non-communist countries is to account for 35-40 per cent of the total and capital imports are to double over the period reflecting a continuation of trends in the

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direction and structure of Rumanian trade established during the Six-Year Plan. There seems little reason to doubt that these goals will be attained, assuming that the political climate remains favourable. Western trade statistics for the first few months of 1966 and recent reports of trade agreements involving Rumanian purchases of chemical, meat packing, automobile and iron processing plants from various West European countries confirm Rumania's intentions. Trade agreements with certain CEMA countries for the 1966-1970 period indicate an increase in mutual trade of only 30 per cent over the 1960-1965 period, as compared with a total turnover gain of 55 per cent. Imports of equipment and essential raw materials, particularly from the U.S.S.R., will continue to occupy an important place in Rumanian industrial development, but pressure from CEMA countries to export their inferior industrial goods in return for Rumanian foodstuffs will be resisted if higher quality substitutes are available from the West. A trend towards increased trade with the less-developed areas of the world is anticipated to gain momentum over the next 5 years as Rumania seeks alternate sources of raw material supplies (e.g., iron ore, copper ore, crude oil) in return for deliveries of machinery and equipment (e.g., oil-field and refining equipment, tractors). Surplus trade positions with the communist and less developed areas and increasing deficits vis-a-vis Western countries are expected to persist and the direction of Rumania's trade will be strongly influenced by credit availability. Rumania's reserves of foreign exchange

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are thought to be meagre (e.g., Rumanian's inability to pay the foreign exchange content of the 1966 contribution to the Iron Gates hydroelectric project) and gold production is apparently declining. Improved quality of manufactured goods and good harvests will provide additional exports for Western destinations but increasing competition can be expected from other rapidly-developing countries (e.g., Bulgaria). Competition among West European countries for the Rumanian market is expected to result in continued extensions of credit beyond the five year limit (several such credits have been reported in 1966). The avowed intention of the EEC to act as an economic entity by 1970 could alter this competition and might conceivably lead to closer cooperation with CEMA in the long-run. On the other hand, reports have circulated that Rumania is interested in some sort of association with the EEC, as yet not spelled out.

Economic Developments of Possible Interest to Canada

13. A cursory comparison of the Rumanian and Canadian trade patterns would lead to the general conclusion that the two economies are competitive rather than complementary. Both rely heavily on similar staple commodities (e.g., agricultural produce, timber, crude oil) for export earnings and obtain a substantial proportion of machinery and equipment requirements from abroad. Both countries have been dependent on one large partner for both imports and export markets. However, the wide gap in the development stage

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of the two economies and the common areas of interest in industry and agriculture could provide certain opportunities for Canada to participate in the expanding Rumanian market.

14. It appears that Rumania wishes to establish economic relations with a wide group of partners and will look most favourably on those willing to establish formal trade relations, accept Rumanian exports and extend favourable credit terms. In selecting trading partners the Rumanians will be aware of the prospect of a supra-national EEC trading entity within 5 years and its possible effect on their bargaining position. On the other hand they will be aware of the trade liberalization measures carried out in 1964 by the U.S.

15. The continued re-structuring of Rumania's economy towards heavy industry generates import requirements for which the Rumanians might show interest in Canadian capabilities.

(a) The rapid shift in Rumania's energy base towards large increases in electric power output has led to plans to acquire two 500-megawatt nuclear power stations. Although it now appears that acquisition of the first unit is to be delayed until 1970 or later, Canadian experience in the use of natural uranium might be very important to the Rumanians in their eventual choice of supplier. Rumania possesses reserves of natural uranium which could be utilized by a Canadian installation as opposed to French, British, U.S. and Soviet stations which utilize enriched uranium

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thus making Rumania dependent on foreign fuel supplies.

(b) Development of the natural gas industry has led to recent demands for various pieces of related equipment (e.g., gas compressors).

(c) Rumanian demand for supplies of high quality iron ore for the Galati steelworks has resulted in a shift from complete dependency on the U.S.S.R. to a search for alternate suppliers. Rumania has shown an interest in purchasing iron pellets from Canada in return for the provision of technical assistance and equipment towards establishing a pelletizing plant in northern Ontario.

(d) High priority given by Rumanian planners to investment in the chemical industry has resulted in a determined search for plant and equipment to produce a wide variety of chemicals and petrochemicals such as polybutadiene and polyisoprene for the production of synthetic rubber; ethylene and chlorine for the production of plastics; polythene for the production of plastics. In addition, until the Rumanian industry has achieved self-sufficiency there will be demands for such products as synthetic fibres, resins, rubber and plastics.

(e) Rumanian plans for heavy investment in the mining sector call for imports of mining equipment for the recovery of such elements as lead, zinc and copper.

(f) Reports indicate that Rumania is seeking various types of food-processing machinery. Specific requirements have not been detailed

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but some contracts have been drawn up for bakery plant and equipment.

16. In spite of the low investment priority given to agriculture and forestry, Rumanian import requirements may include the following:

(a) According to the Five-Year Plan, Rumanian production of chemical fertilizers is scheduled to increase from 0.5 to 1.3 million metric tons over the period. In the meantime, domestic production must be supplemented by imports.

(b) Despite the recent slow-down in the rate of farm mechanization, Rumanian trade delegations have shown keen interest in acquiring specialized machinery (e.g., seeders, fertilizer spreaders, weeding machines).

(c) Contrary to the general trend in agriculture, meat production in Rumania rose steadily over the Six-Year Plan and improved quality of livestock is given prominence in current plans. Import requirements might include livestock for breeding purposes, packing plant equipment and forage crop seeds.

(d) Increased mechanization of the Rumanian lumber and paper industry has resulted in recent demands for such items as chain saws, a pulp-mill digester, a fully-automated lumber mill and a paper-wrapping machine.

17. There are other less obvious commodities that might enter the Rumanian market in response to the demands of the Five-Year Plan. For example, the past low priority given to large-scale investment in construction

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and the inability to complete projects indicates a possible market for prefabricated units (e.g., schools, hospitals, labour housing units).

18. In selecting trading partners, the Rumanians will be strongly influenced by the willingness of countries to facilitate Rumanian payments. In addition, they may consider that only such items as light manufactures are likely to find easy access to the Canadian market. In view of payments pressures, they will be looking for a willingness to consider joint projects on a barter basis and to extend long-term credit.

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TABLE I

RUMANIA - BALANCE OF PAYMENTS IN CONVERTIBLE CURRENCIES
U.S. $MILLION *

I. USING RUMANIAN TRADE STATISTICS

Foreign Trade with Multilateral Partners	1961	1962	1963	1964
Total:	294.6	330.4	369.0	415.0
Exports fob:	131.3	133.6	158.2	186.5
Imports fob:	163.3	196.8	210.8	228.5
Balance:	-32.0	-63.2	-52.6	-42.0
Other Items				
Freight on Imports:	-9.8	-12.0	-12.6	-13.7
Tourism:	+1.1	+1.1	+2.2	+3.6
Interest on Western Credits:	-2.5	- 2.8	- 5.0	- 5.6
Subscriptions to International Organizations:	-0.8	- 0.8	- 0.8	- 0.8
Compensation Payments:	-2.2	- 2.5	- 4.2	- 5.3
Net Balance:	-46.2	-80.2	-73.0	-63.8

II. USING WESTERN TRADE STATISTICS

Foreign Trade with Multilateral Partners	1961	1962	1963	1964
Total:	281.7	312.2	350.3	381.9
Exports fob:	136.1	138.3	166.9	180.9
Imports fob:	145.6	173.9	183.4	201.0
Balance:	-9.5	-35.6	-16.5	-20.1
Other Items				
Freight on Imports:	-8.7	-10.4	-10.9	-12.0
Tourism:	+1.1	+1.1	+2.2	+3.6
Interest on Western Credits:	-1.4	-2.8	-5.0	-7.0
Subscriptions to International Organizations:	-0.8	-0.8	-0.8	-0.8
Compensation Payments:	-2.2	-2.5	-4.2	-5.3
Net Balance:	-21.5	-51.0	-35.2	-41.6

* All figures converted to U.S. dollars at the official rate, U.S. $1 = 6.0 lei

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DATE December 1966

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Ottawa

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Communist Economic and Military

Aid Activities in the Underdeveloped Areas

November, 1966

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JIB(CAN) 33/66

Communist Economic and Military Aid Activities in the Underdeveloped Areas

November, 1966

PART I: ECONOMIC AID

AFRICA

Congo (Brazzaville)

1. A Congolese government delegation visited Peking recently and is reported to have discussed implementation of a Chinese credit valued at $20.2 million extended in 1964. Apart from some preliminary work on a textile complex in Brazzaville and a geological survey the credit is largely unused. It is believed that the discussions concerning the utilization of the Chinese credit are likely to include the extent to which the Chinese are prepared to finahce the local cost of their aid. The Soviet Union has already experienced difficulty over this and has had to extend Congo (Brazzaville) additional aid in the form of a commodity credit to finance part of the local costs of its aid programme in Congo (Brazzaville). (CONFIDENTIAL)

Ghana

2. A recent report indicates that the remaining four IL-18's supplied by the Soviet Union to Ghana Airways have now been returned to the USSR. Originally Ghana purchased eight of these aircraft from the Soviet Union at a total cost of about $15 million and financed the purchase under a Soviet credit extended to Ghana in 1960. However, in 1963 Ghana returned four of the IL-18's to the USSR because of excessive operating costs. At that time agreement was reached that repayment made on the returned aircraft would be credited toward the payment for the remaining four aircraft retained by Ghana. However, adjustments made for the recently returned IL-18's are unknown at this time. (CONFIDENTIAL)

Mali

3. A Malian delegation visited Warsaw in October, 1966 for discussions on scientific and technical cooperation. The two countries

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are also reported to have discussed the dispatch of Polish technicians to Mali and the training of Malians in Poland. It is considered likely that the discussions covered the whole range of Polish aid to the Malian economy since, up to the present time, virtually no progress has been made concerning utilization of a Polish credit for $7.5 million extended to Mali in 1962. (RESTRICTED)

Morocco

4. The value of Soviet development aid to Morocco (see JIB(CAN) 30/66) is reported to be about $35 million. In addition, a commerical credit for the purchase of Soviet machinery may also have been extended to Morocco. (UNCLASSIFIED)

Sudan

5. A protocol signed with Bulgaria in October, 1966 provides for the supply of complete industries, deliveries of machinery and a geological survey and implies that Bulgaria has extended Sudan an economic development credit although no value has been announced. The Bulgarians are also reported to be interested in establishing light industrial plant, including chemical and canning factories in Sudan. During a recent visit to Bulgaria the Sudanese Minister of Industry is reported to have discussed a Bulgarian offer to assist in oil prospecting and in the exploitation of iron and copper ores and other minerals. (UNCLASSIFIED)

6. The Soviet Union has agreed to extend technical assistance to Sudan for the construction of Sudan's first tuberculosis hospital in Khartoum. Soviet architects have already designed the 400 bed hospital and the USSR will supply much of the equipment. (UNCLASSIFIED)

Togo

7. Following his return from a 12-day visit to the Soviet Union the Togolese Minister of Agriculture announced that Togo wishes to acquire Soviet agricultural machinery. Up to the present time Togo's economic relations with the Soviet Union have been limited to a trade agreement dating from 1961, although trade between the two countries is minimal, and a cultural agreement signed in 1965.

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8. President Grunitsky intends to visit the Soviet Union towards the end of 1966 or early in 1967 and if the Soviet Union intends to extend credit an offer may be made during the presidential visit. (RESTRICTED)

Somalia

9. Somalia and Communist China recently concluded an agreement for Chinese aid to agriculture, irrigation and industry. Projects arising from the agreement are likely to be financed under a Chinese credit for $28 million, extended to Somalia in 1963, and represents the first drawings on the Chinese loan. (RESTRICTED)

Tunisia

10. During a recent visit to Roumania by a Tunisian economic delegation two protocols are reported to have been signed. One called for increased trade between the two countries and the other concerned the possibilities of economic cooperation in the fields of mining, the building materials industry and the chemical industry. Tunisia has no credit agreement with Roumania but the recently signed protocol for economic cooperation may signify that a Roumanian credit is being considered. (UNCLASSIFIED)

11. The Tunisian Secretary of State for Planning visited Moscow in October where he saw Skatchkov, Chairman of the Soviet State Committee for External Economic Affairs, and Patolichev, the Minister of Foreign Trade.

12. Tunisia received a credit for $28 million from the Soviet Union in 1961 which was obligated for the construction of five dams. Soviet surveys were completed in 1965 and contracts were signed for work to begin on at least two of the dams in 1966. However, only minor progress has been made and it is believed that the purpose of the recent visit may have been to ask more rapid implementation of the 1961 agreement. In addition, Tunisia may also have been seeking new economic aid. (CONFIDENTIAL)

Uganda

13. An economic mission from Uganda led by the Secretary of the Ministry of Finance visited Peking in October. The purpose of the visit was probably to discuss utilization of a $12 million credit extended by

..../Communist China

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Communist China in 1964. Up to the present no drawings have been made on this credit. (RESTRICTED)

ASIA

India

14. Under its aid agreement with India the Soviet Union has been conducting off-shore oil exploration and production in the Cambay and Anklesvar areas and reportedly has confirmed the existance of oil in the off-shore area of Cambay. However, it then declined the assignment of exploration drilling reportedly because it could not perform off-shore drilling at depths greater than 60 feet. India has now opended negotiations with a US firm to conduct the exploratory drilling. (UNCLASSIFIED)

15. The Soviet Union has offered India equipment and agricultural machinery for the establishment of five state farms with an area of 10,000 acres each as a gift. In addition, the Soviet Union has expressed its readiness to deliver on credit, equipment and machinery for the setting up of another ten state farms and 15 tractor stations.

Pakistan

16. During October, 1966 Communist China and Pakistan concluded a maritime transportation agreement providing for reciprocal extension of facilities and assistance to the ships of each signatory in the ports of the other. The agreement follows the establishment in 1965 of a regular shipping service between the two countries and ships of both countries have been calling at each other's ports for over a year. The agreement is characterized by Pakistani officials are being politically desirable but of no great utility in itself. (RESTRICTED)

Ceylon

17. A protocol on the exchange of commodities between Communist China and Ceylon was signed on 30 November. Rice and rubber contracts were included in the protocol. (UNCLASSIFIED)

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Afghanistan

18. Recent reports, following negotiations between the Soviet Union and Afghanistan, indicate that the Soviet Union may have extended Afghanistan a commodity credit valued at $50 million and a new $100 million development credit for the Afghan third five year plan. One of the projects discussed for inclusion in the new development plan is an iron ore smelting plant. (RESTRICTED)

19. Previous Soviet economic aid to Afghanistan is estimated at about $600 million of which $390 million has been drawn. (RESTRICTED)

LATIN AMERICA

Brazil

20. Additional information has been received concerning the $100 million commerical credit arrangement concluded between Brazil and the Soviet Union in July, 1966 (see JIB(CAN) 21/66). Under the agreement Brazil has agreed to purchase Soviet machinery and equipment from the Soviet Union. Individual contracts must be approved and registered by both governments and be backed by Brazilian Treasury guarantee, issued directly or through Treasury agencies or approved commercial banks.

21. The credits may be amortized over an eight year period at 4 per cent interest, with 5 per cent payable at registration of the contract and 10 per cent upon presentation of the bill of lading. The remaining 85 per cent is payable in equal semi-annual installments, beginning up to two years after delivery; these two years are included in the amortization period. Both governments will try to use $30 million of the credit by the end of 1967, an accumulative total of $60 million by the end of 1968 and the remainder by the end of 1969. Contracts will be written in dollars but are payable in Brazilian cruzeiros. The Soviet Union has promised to use the repayment funds for the purchase of Brazilian commodities, with finished and semi-finished Brazilian commodities comprising 25 per cent of the total purchase. (CONFIDENTIAL)

Chile

22. Czech and Polish experts are reported to be studying the possibility of participating, either jointly or separately, in the establishment of

..../industries in

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industries in Chile. Czechoslovakia is reported to have offered a line of credit for the purchase of Czech industrial goods, but Poland, up to the present time, has not offered aid. (UNCLASSIFIED)

Philippines

23. It has been announced that an unofficial but representative delegation including politicians and business men will visit the Soviet Union in 1967. The Philippines have no formal relations with the communist countries. A similar group visited Communist China early in 1966 and met the Vice Chairman of the China Council for the Promotion of International Trade.

Cuba

24. According to recent press reports East Germany is supplying Cuba with $24 million worth of boilers, generators and other equipment for the Cuban sugar industry, and the Soviet Union will provide the credit out of a $77 million loan it extended to Cuba for that industry. Soviet aid also includes a $55 million transport credit part of which is likely to be used to finance Hungarian and other East European deliveries of equipment. No new credits have been extended to Cuba by the East European communist countries. In 1964 most of these countries extended trade deficit credits, but in 1965 they appear to have kept their trade more nearly in balance.

25. The current transactions appear to suggest that any credit that Cuba requires to cover the costs of East European equipment is now being provided by the Soviet Union. (CONFIDENTIAL)

Turkey

26. Turkey and the Soviet Union have reached agreement on the construction of a sulphuric acid plant at Banmira, Turkey. The plant is scheduled to be completed in 1969 and is to be financed by a $4.4 million Soviet credit. The credit is reported to cover both the local currency and foreign exchange costs of the project and is to be repaid by deliveries of Turkish products over a 15 year period with interest at 2.5 per cent. (CONFIDENTIAL)

27. The sulphuric acid plant is the first project to be implemented under a line of credit, valued at about $200 million, extended to

...../Turkey by

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Turkey by the Soviet Union in 1965. The Soviet Union may also be awarded a contract for the construction of an aluminum plant in Turkey. A Turkish official is reported to have stated that the Soviet offer for its plant is attractive and the prices quoted reportedly are better than those tendered by American firms. Other Soviet aid projects mentioned under the 1965 Soviet aid agreement include an iron and steel plant, an oil refinery, a fibreboard plant and expansion of a glass factory. (CONFIDENTIAL)

Iran

28. Discussions between Iran's Deputy Minister of Economy and officials of Poland's State Committee for Cooperation with Foreign Countries began in Warsaw on 9 November, 1966. Tehran sources state that Iran is negotiating a long-term aid agreement with Poland, reportedly valued at $50 million, for the purchase of industrial plant and equipment. (UNCLASSIFIED)

UAR

30. Soviet engineers employed at the UAR's Aswan High Dam have expressed confidence the Dam would be completed in 1967, almost a year ahead of schedule. The hydroelectric and irrigation schemes are expected to be completed in 1969, also a year ahead of schedule. (UNCLASSIFIED)

Syria

31. At the end of October a Syrian economic delegation signed a trade protocol with the Soviet Union providing for a total trade exchange of $35 million in 1967. Under the protocol the Soviet Union will supply machinery and equipment, consumer goods, chemicals, fertilizers, oil products and metals. In return, Syria will sell the Soviet Union cotton, wool, hides, fabrics and footwear. (UNCLASSIFIED)

32. Poland has been awarded a contract to build a steel-rolling mill in Hama, West Syria. The mill's capacity will be 75,000 tons of reinforcing

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steel and mouldings annually.

33. Polish engineers will build the plant and supervise the initial production while Syrians are being trained in Poland. (UNCLASSIFIED)

AFRICA

Algeria

Continued Large Scale Arms Shipments

34. Contrary to a previous forecast that arms contracts between Algeria were largely fulfilled following large deliveries of Soviet military equipment to Algeria during the first mine months of 1966, five Soviet vessels off-loaded a considerable quantity of military equipment at Algiers during October and November. Aviation equipment for the Algerian air force included nine IL-28 light bombers and ten MIG-17 jet fighters. Other hardware delivered included two KOMAR class guided missile patrol boats, eight KS-19 100 mm AA guns, twenty-one 100 mm AA guns, twelve JSU-152 self-propelled heavy assault guns, ten 122 mm field guns, fifty-eight 107 mm recoilless guns, thirty-eight 37 mm AA guns, nine radar or communications vans, four SON-4 (WHIFF) anti-aircraft fire-control radar vans, at least nine 160 mm mortars and a considerable quantity of ammunition. (SECRET)

Tanzania

Arrival of Chinese Equipment

35. A Chinese ship docked in Dar es Salaam on 12 November and was placed under strict security guard. The following day Tanzanian troops off-loaded four 20 ton patrol boats, some armoured vehicles, 12 37 mm guns and crates of ammunition. Also aboard the Chinese ship were 70 tons of "dangerous" cargo and several military transport vehicles destined for Hodeida in Yemen. The patrol vessels are for the use of Tanzania's marine police force and according to a Tanzanian government spokesman were received as a gift from China. The spokesman also disclosed that China had undertaken to train Tanzanian seamen and that a total of 40 have already completed their training (at least 30 of these are reported to have returned). He added that Chinese instructors would be required for a short time to train the marine police in the use of the boats. (SECRET-CANUKUS EYES ONLY)

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MIDDLE EAST

Iraq

Possible Arms Purchase from Czechoslovakia

36. An Iraqi military delegation headed by the army chief of staff visited Czechoslovakia in the latter part of November and it is believed that the purchase of arms was discussed. (CONFIDENTIAL)

UAR

Visited by High Level Delegation to USSR

37. A high level UAR delegation headed by Field Marshal Amer, the first vice president and deputy supreme commander of the armed forces, visited the Soviet Union from 22 through 27 November and had talks, described as political, economic and military, with senior Soviet officials. Included in the delegation were the defence and planning ministers and the chiefs of the navy and air force. There are no details on the subjects discussed but there is speculation that additional Soviet military aid to the UAR may have been among the subjects covered. Deliveries are still taking place under the large agreement of November 1964 but it is possible that despite its economic difficulties the UAR wished to arrange for additional procurement. (SECRET)

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JIB(CAN) 33/66

Communist Economic Aid Extensions to Less Developed Countries November 1966

EXTENDED BY	RECIPIENT	MILLION US$ VALUE
SOVIET UNION	IRAN	290.0*
	PAKISTAN	20.0
	PAKISTAN	84.0
	SYRIA	134.0
	CAMEROUN	7.7
	BURMA	14.0
	MOROCCO	35.0
	SOMALIA	4.2
	BRAZIL	100.0
	INDIA	630.0
		1,318.9
CZECHOSLOVAKIA	PAKISTAN	28.0
HUNGARY	INDIA	52.5
BULGARIA	SYRIA	15.0
	INDIA	15.0
		30.0
COMMUNIST CHINA	TANZANIA	8.5
	CAMBODIA	42.9
		51.4
	TOTAL	$1,480.8

* Soviet credits for $20 million to Pakistan and $290 million to Iran were not included in 1965 totals.

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SOURCES

Building Gazette	Stroitel'naya Gazeta
Bulletin of the All-Union Scientific Research Institute of Railway Transport	Vestnik Vsesoyuznogo Nauchnogo Issledovatel'skogo Instituta Zheleznodorozhnogo Transporta
Bulletin of Foreign Commercial Information	Byulletin' Isnostrannoy Kommercheskoy Informatsii
Civil Aviation	Grazhdanskaya Aviatsiya
Communist	Kommunist
Economic Gazette	Ekonomicheskaya Gazeta
Finance USSR	Finansy SSSR
Foreign Trade	Vneshnyaya Torgovlya
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Maritime Fleet	Morskoy Flot
News	Izvestiya
Official Gazette of the USSR	Vedomosti Verkhovnogo Soveta SSR
Planned Economy	Planovoye Khozyaystvo
Questions of Economics	Voprosy Ekonomii
Railway Transport	Zheleznodorozhnyy Transport
Red Star	Krasnaya Zvezda
River Transport	Rechnoy Transport
Shipbuilding	Sudostroyeniye
Soviet Union	Published in English
Soviet Union Today	Published in English
Statistical Bulletin	Vestnik Statistiki
Truth	Pravda
Water Transport	Vodnyy Transport
Whistle	Gudok
Wings of the Motherland	Krylya Rodiny

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GLOSSARY

CPSU	Communist Party of the Soviet Union
Kray	Administrative Region
Oblast'	Administrative Region
Okrug	Administrative Region
Rayon	Administrative Territorial Subdivision
RSFSR	Russian Soviet Federated Socialist Republic
Taiga	Dense Forest Between Tundra and Steppe

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Karpov is in the Air

Planes and helicopters were returning one after another to the ice camp. Much work had been done that day by the members of the high-latitude expedition. The operation "Sever" (North) was in full swing, but there were still many jobs to be done. Suddenly, the telephone rang in the tent of the base commander. The radio station reported that ice had begun to hummock around "the nearest neighbour". The polar explorers and their equipment were threatened with diasaster. The "AN-2" aircraft was needed most urgently to evacuate the camp into a quiet area.

The crew of Yevgeniy Alekseyevich KARPOV was aroused by the alarm. A few minutes later they were all at their aircraft. Having filled the tanks with fuel and taken along three extra barrels of gasoline and provisions, the airmen took off a mere thirty minutes after the alarm signal was received and sped off on a westward course.

Their route passed north of the 85th parallel over regions where planes were extremely rare guests. For hundreds of kilometres around there was nothing but ice and more ice, and beneath it -- thousands of metres of the ocean deep. No landmards of any kind! The weather -- poor, thick fog, probably icing-up. One can use only the astro-compass and this not all the time, either. During most of the flight the sky was completely clouded over.

They were four and a half hours in the air. "They are waiting for us, they rely on us" these were the airmen's thoughts. When the plane was approaching the camp, where the polar explorers got into difficulties, it became quite apparent that "AN-2" could land only on the unbroken part of the ice floe which was only two hundred metres long and twenty metres wide. Soon Karpov was warned: "Fog is rolling in. The ice debacle continues".

The plane descened into the fog and flew low over the ocean. It could not be seen from the ice floe, only the roar of the engine was heard. Then the plane made a turn and passed overhead, this time lower. Again it could not be seen from the ice floe, but the airmen had noticed the dark outlines of tents. After several turns, the plane seemed to have taken hold of some visible part of the imaginary landing strip and put its skis down on ice at the very edge of open water. A short run, and "AN-2" stopped dead. But it was too soon to rejoice.

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One polar ice-field was sliding over the other. Huge ice hummocks, as if they were small chips, stood on their edges, they collided, turned right over, and tumbled down into the water. A wall of ice, ten to fifteen metres in height and about one kilometre long, breaking everything in its path, was slowly but relentlessly sliding towards the tents and the research pavilions. These were literally snatched off from the "live", shifting ice. A deep crack appeared suddenly in the ice beneath the tent which housed the radio station. At any moment the ice could break apart.

Without stopping the engine, Karpov took the camp commandant aboard and flew off. The reconnaissance lasted two hours. Although all around the camp there was nothing but heaving masses of ice, they had the good fortune of spotting a quiet field a few kilometres away. Again the plane landed. The ice-floe was suitable. They decided to transfer the camp onto it. Many flights had to be made under the most difficult conditions. Members of the crew helped to load and to unload their plane. The fight against the elements lasted two full days. When the "re-settlement" was over, and everything was safely away from the crushing and hummocking ice, the airmen breathed a sigh of relief.

The ice hummocks stood high like rocky mountains. Under the flood of sun rays they had a delicate bluish glow. The base was once more in operation, and the victor of the unequal skirmish -- the crew commanded by KARPOV -- returned to their camp located on a drifting ice-floe. The author of this article was: M. FILIPENIN.

Vodnyy Transport
18 August 1966
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(Full text)

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CONSTRUCTION

We Can Only Dream of Resting

I was told about him in Mirnyy, the principal diamond centre in our country, in Aykhal, a settlement near the Polar Circle, and in Nyurba, the geological capital of the Yakut Republic.

I just could not, therefore, avoid meeting him and, having met him, refrain from writing about this man.

Pavel Ivanovich MEL'NIKOV is his name; he has been living and working in the Yakut Republic for over a quarter century. He is 56 years old, a Doctor of Sciences, Professor, and Director of our country's one and only Institute of Permafrost Studies. This is only general information about him.

I should like to add to it just this much: in his life there was nothing unusual, no sharp or startling turns of fortune, nor any extremely critic situations. Consequently, there will be none of these in my story. I will try to describe Pavel Ivanovich just as he is: a common labourer of science not thirsting for glory but, at the same time, a scientist whose name is universally known; a modest, considerate man and the director of a large scientific centre which, to a considerable extent, has been created thanks to his, Mel'hikov's, diligence and efforts.

Mel'nikov's private office has wide windows, full of light provided by the cold spring-time sun of the Yakut skies, a big map of that land is on the wall with wavy lines which show the borders of the permafrost zone.

The problem of permafrost is a down-to-earth, as vital as daily bread, a stirring problem which embraces a multitude of questions of man's practical endeavours. Do not for a moment think that my words contain any kind of exaggeration! Take just this one figure: forty-seven per cent of our country's territory lies within the permafrost zone! The entire land of the Yakut is within it!

Walking along the Yakutsk streets, I did not realize that immediately beneath the thin, barely one metre thick layer of soil, there begins the formidable stratum firmly locked-in by frozen earth which reaches the depth of three hundred and fifty metres. A short distance north of the city this frozen-earth stratum measures up to 600 metres. And around the upper reaches of the diamond river Markha the depth of permafrost reaches the mark of two thousand metres. The land of the Yakut lies on top of a solid, thousands of years old, frozen slab; forests grow above it, the tundra covers it, and rivers flow atop it.

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In summer, permafrost is like a perpetual earthquake; its top layer thaws out, and houses more than one storey high are out of luck. Prior to the middle of this century, 99% of the Yakut Republic was a land of one-storey houses. But one cannot build a new life without being able to construct tall buildings to house people, and to provide floor space for factories, mills, electric power stations...

Nowadays, the streets of Yakutsk are lined with tall, four-storey high and higher, brick and slab-construction buildings fearless of and impregnable to permafrost. The construction of these houses was first started here twenty years ago, in 1946. Mil'nikov took up residence in Yakutsk in 1940.

A little before that, he surprised many of his friends by declining an offer to work in the Caucasus. Professor Slavyanov, who made that offer, was equally surprised. He knew Mel'nikov as one of his students at the Institute, he knew also that Mel'nikov on several occasions visited Siberia and lived in Igarka from 1935 to 1939. In the professor's opinion, this was quite sufficient, and it was high time for Mel'nikov's romantic ardour to be cooled off.

"Mel'nikov, are you not tired of it?"--asked Slavyanov.

It seems that, after all, he did not know much about his student and nothing at all about the young scientist who stood in front of him. He believed that his offer was for the better, and that one simply had no choice between the land of the Yakut and the Caucasus. But Mel'nikov was not interested in a better location. He was more concerned about his usefulness, and this simple thought turned out to be his main consideration which led to an irrevocable decision.

Moreover, it was not his habit to dodge privations and burdens. Mel'nikov's life, from his childhood onwards, has taught him to rely on his own strength, skills and knowledge. This was the true source of his particularly firm character which always helped him to reach the desired target. He grew up in Petrograd in one of its orphanages which, as from October 1917, began to be referred to as children's home. When he was old enough he joined the Komsomol and, having volunteered for service in "CHON" (Special Purpose Units), he was given a rifle.

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He came to the "Krasnyy treugol'nik" ("Red Triangle", a well known rubber plant) having turned away from the straight and bright road which stretched before him. Mel'nikov spent three years in the Naval Officers' School; for three years he walked the unsteady plankings of ship decks; for three years he studied to be a naval officer. During the fourth year he appeared in the stuffy and noisy shops of the rubber plant "Krasnyy treugol'nik" -- he left the romanticism of the sea for the prosaic humdrum of everyday labours.

Mel'nikov liked the plant; he liked the strict succession of production cycles, the machines, so obedient to men; the smell of shops, the comrades with whom he was working, -- all this was a part of his own endeavours. But above all, Mel'nikov wanted to study. He enrolled in the Leningrad Mining Institute feeling intuitively that he was taking the decisive step of his life. He studied by day and had a night job to make some extra money because the forty-five roubles scholarship was insufficient to cover the needs of his family -- wife and child. At last, having graduated from the third course, he was accepted for in-job training by the Permafrost Commission of the Academy of Sciences and left for Siberia.

"Every beginning is difficult -- this is true of any science". These words of Karl Marx apply in full measure to the knowledge of permafrost at the time of Mel'nikov's first journey to Siberia. The study of permafrost was initiated by two outstanding scientists, two wonderful men, who were Mel'nikov's teachers and whose lessons he treasures solemnly to this day: the Academician Vladimir Aleksandrovich Obruchev and the Professor Mikhail Ivanovich Sumgin.

It was Obruchev who supported and encouraged Mel'nikov when the latter had set about to prove that the land of the Yakut was in possession of huge reserves of artesian water and that the problem of water supply there could be solved. It was Sumgin who talked Mel'nikov into going to Igarka to take charge there of the permafrost study establishment, and who consistently watched closely over the work of the young director, who used to visit him and who gave special approval to the extra-curricular activities of his pupil, namely the planting of the first trees in Igarka. Birches and spruces have taken root beautifully, and new trees were planted beside them. Thus, the opinion that no trees could survive in Igarka was refuted.

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Of course, trees were not Mel'nikov's main achievement in Igarka. The establishment under his direction has made exhaustive ground studies and supplied builders with vital recommendations. For the first time there, in Igarka, buildings were erected on piles which, of course, were made of wood. Nevertheless, it was our country's first experiment, the first step which has brought nearer the vision of large cities rising up in the perilous zones of the eternally frozen earth.

But I think that, after all, the matter of trees was worth mentioning because it was one of the activities in Mel'nikov's life which he does not in any way consider to be of secondary importance. He is always concerned about people and, consequently, he devotes much of his strength to public affairs. In Igarka he was a member of the Party's Town Committee, in Yakutsk he was for fourteen years the Communists' choice for the Oblast' Committee, on several occasions the citizens of the Yakut Republic have entrusted to him the title of their Deputy to the Supreme Soviet. The tireless and useful public activities of Professor Mel'nikov, in my opinion, are a continuation of the better traditions of Russian scientists who never did live for the sake of science alone...

...In Yakutsk and Mirnyy I saw tall modern buildings which stood, as if they had legs, on reinforced-concrete piles. There was a space of about half-a-metre between their foundations and the ground, as measured by the naked eye. With a feeling of obvious pride, Mel'nikov was guiding me through the streets of the Yakut capital, was showing these buildings to me, and then stopped for a particularly long time in front of one of them, a two-storey stone structure, which, judging by the signboard, was now housing a school.

"The very first", -- said Mel'nikov. "Year of birth -- 1946".

And he continued with a smile: "How much grief we had with it! There was no end to it!"

The idea was clear: the first thing to do was to sink down into the permafrost layer reinforced-concrete piles which, according to all calculations, would serve as a firm support for the house and would protect it against the treacherous, summer-time shifting of the Yakut ground. But several years went by before Mel'nikov's idea could achieve its material realization in the form of mechanical devices for driving-in the piles -- huge hollow needles which paved the way for piles into the permafrost

/stratum. At

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stratum. At present, the initial phase of putting up a structure looks like this: under high pressure, hot steam is fed down through the hollow pipe -- "the needle" -- into the permafrost layer to, as it were, push it asunder in order to win from it enough room for the pile. Six-metre long piles, weighing three tons each, become, after a certain time, forever frozen solidly into the ground. The structural support is ready. Next, a reinforced-concrete frame is put onto the piles, atop the frame -- a reinforced-concrete cushion which, in winter, keeps the ground cold from penetrating the bottom of the house and the warmth inside the house from thawing the permafrost's upper layer. This is the way houses are built nowadays in the Yakut land. And it occurs to me that in everyone of these houses the name of Professor Mel'nikov should be remembered with gratitude...

I asked him: "Pavel Ivanovich, what do you consider to be the main activity in your life?".

"This is it", -- he pointed at the walls within and the space beyond his private office. "All this, the Institute!"

The transformation of the expedition, headed by Mel'nikov, first into an establishment of permafrost studies, then into a branch of the institute, and, finally, into the Institute could easily be a subject of a separate article. One could describe all the enthusiasm, passion, and the profound understanding of the perspectives of further scientific developments which prompted Mel'nikov to prove the importance of creating this centre in the Yakut Republic. The way he selected his co-workers and his precise definition of the trends in the scientific work of the Institute are also worth writing about. The land of the Yakut is in the process of industrialization; the construction of manufacturing plants, dams, and power stations is in full swing. Thus, the scientific forecasts of permafrost experts are needed, just like a compass by seafarers, by planners and builders who have committed themselves to the transformation of the taiga and the tundra countryside.

The director's working day is filled with tremendous inner tension. Many urgent and important matters demand his attention. It is impossible to fit them all into the Procrustean bed of time, consisting of minutes and hours, and that is why Mel'nikov is so brief in expressing so clearly and simply his thoughts, wishes and instructions. Mel'nikov's young colleagues are eager to learn his style of work, so calm, so businesslike, and so disposed to scientific daring.

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Mel'nikov's name is well known to the world of scientists. He enjoys a particular popularity in Canada, a country where the problem of permafrost is acute not only theoretically but also in actual practice, the same as in the Yakut Republic. His works have been published in many countries of the world...

Fifty-seven years is a fairly advanced age. Mel'nikov is often asked the same question which Professor Slavyanov had put to him long ago:

"Have you not lived long enough in Yakutsk? You have so many times been invited to work in other cities where conditions are better and, above all, where the climate is different. After all, you must think about your health..."

"I still have a lot of work here", Mel'nikov usually replies. And to these words he sometimes adds Blok's famous quotation: "And in the eternal battle we can only dream of resting..." The author of this article was: A. Nezhnyy, Special "Trud" correspondent, Yakutsk.

Trud
17 August 1966
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ECONOMIC DEVELOPMENT

"Green Light" to the Tyumen' Oil!

Regardless of whether the towing vessel "Korolenko" is hurrying with the empties down stream towards the lower reaches of the Ob', or pushing barges pressed deep down into the water by their heavy loads of oil upstream, admiring glances are always cast its way from wharves and passing vessels.

-- Look at her speed! Just like a real express... And it is true! Right from the start of the navigational period this steamer has been showing a surprising speed, unusual for vessels of this type. When going down-stream, it leaves behind over twenty kilometers per hour, instead of the normal sixteen. It exceeds the technical speed by three to four kilometres even when it travels upstream. Several solar days are thus saved literally on every voyage...

The crew of "Korolenko", headed by GRIGORIY NEMTSEV, was the first one on the Ob' to be trusted with the opening of the oil shipping route. And this honour is highly treasured. The May plan for shipping "black gold" extracted in the north of the Tyumen' oblast' has been fulfilled by 105%; the June plan -- by 162%. The July assignment has been overfulfilled just as considerably. Moreover, the crew has over 150 tons of saved-up fuel to its credit.

This body of sailors is outstanding in its enviable diligence. The navigating officers NIKOLAY BUKIN and NIKOLAY FEDOROV did not need much time to become thoroughly acquainted with the sailing directions in these unfamiliar waters and now pilot their vessels through them with full confidence. The sailors ZOYA BELYAYEVA and VALENTINA ANIKINA are fast and precise in carrying out orders of officers of the watch; they keep the vessel clean and in good order. All engines and other mechanisms function perfectly and without interruption because they are maintained in excellent condition by the master mechanical engineer VALERIY DOBROVOL'SKIY, by his aids YURIY KISELEV and VLADIMIR SAL'NIKOV, and by the machinists SERGEY YAGODIN and NIKOLAY TOLMACHEV.

The crews of the towing vessels "Kuzbass", "Dnepr", "Dobrolyubov" and "Simferopol'", captained by GRIGORIY SHET'KO, ALEKSEY POZNAKHAREV, VALENTIN MANAKOV and MIKHAIL TIMOFEYENKO respectively, are also working productively on this great Siberian oil shipping route. Their work is well co-ordinated and accident free; as a rule, they fulfill their monthly quotas ahead of schedule, and save much travelling time. Every crew member is eager to perform his duties as quickly as possible.

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The flow of oil on the great Siberian river is constantly gaining momentum. If only something over thirty thousand tons were shipped in May, in June the total was not less than one hundred and fourteen thousand tons. A certain increase was achieved likewise in July; on the average, every decade does now account for forty-five thousand tons.

But this is not enough. Seemingly, the shipping agency will be unable to make full use of all the possibilities and reserves at its disposal. Actually, they are truly considerable. The presently available tonnage is fully adequate for shipping up to eight or even ninety thousand tons of crude oil every half month from Megion, Belyy Yar, Pimskaya, Sosnino, and from other points. But then this figure will soon be far below the limit because the ship-builers of Tyumen' are replenishing, every now and then, the agency's tanker fleet.

So what precisely is obstructing the intensive growth of the "black gold" shipments? One of the main reasons is the fact that to date the management of the shipping agency has not succeeded to achieve full working efficiency on the part of those who serve the oil shipping line. For example, the crews of such towing vessels as "Nametchik", "Lotsman", "Feodosiya", "Admiral Makarov" and "Geroy Brin'ko", month after month, do not fulfil their assignments. But particularly bad is the performance of the steamer "Tolstoy". It left the creek of refuge at Novosibirsk for the open stretches of river a whole month too late; then it needed an intermediate refit. It was repaired and modernized to such an extent that now, after every trip, it must spend a lot of time in the creek of refuge.

According to the Chief of the Oil Shipping Department, VLADIMIR KUZYAYEV, our technical maintenance of the fleet is organized very poorly. This has been discussed many times at controllers' meetings, good decisions were made, but the whole matter is progressing very slowly...

He is right. The steamer "Profsoyuznik" which is supposed to carry welders, gas-cutters and other repairmen, is still missing in the harbour of Krasnyy Yar where oil carriers call for repairs. The Moryakovsk repair and maintenance depot is responsible for the delay in the steamer's outfitting. As a result, oil carriers have to be dispatched to the creek of refuge at Novosibirsk, a distance of thirty kilometres, in order to have their paddles, levers, stanchions, or some other parts welded. Is it indeed possible that the shipping agency's chief engineer, A. PUCHKOV, does not realize that this situation leads to enormous losses of precious time and causes superfluous expenditures?

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An inspection point has been set up at the wharf in Kolpashevo. The duty of its personnel is to inspect the passing ships and to "OK" them for the rest of their voyage. Unfortunately, this operational function is still lacking the required co-ordination. Despite the fact that captains warn the wharf by radio about their approach ahead of time, the oil carriers must often waste several hours standing idly while waiting for the arrival of inspection teams. Seemingly, it is up to the Chief of the Narymsk Operational Sector, L. ZYRYANOV, to establish a much stricter control over the services at the inspection point.

Bureaucratic quarrels between the Irtysh and the Ob' Shipping Agencies are another serious hindrance to the work of the oil-tanker fleet. These neighbours engaged in the very same business so important to the entire State, seem to be unable to come to an agreement about the supply of fuel oil to the Ob' river vessels in the Surgut area. Furthermore, when the production of oil in Megion was temporarily interrupted, and the vessels of the Ob' Shipping Agency had to come for it to Belyy Yar and Pimskaya, the officials of the Irtysh Shipping Agency did all they could to have the barges of their neighbours filled at the very last turn.

Facts? Let us have this one! At the end of July, the steamer "Admiral Makarov" took on new barges Nos. 1883 and 1884, arrived at Pimskaya and took up its place in the line-up at the loading berth. But it was not its luck to depart on schedule. The steamer was now and again pushed aside by vessels arriving from the Irtysh river. At last it had a chance to bring its barges alongside to the oil-jetty. One barge was filled with oil and then there was a long break. As a result several days were needlessly wasted.

Normal movements of oiler vessels are rendered difficult by the poor state of the navigational situation. The director-captain, KHAMZYA TAKHAUTDINOV, who has travelled from the mouth of the Tom' river to Megion, has found that one hundred and eighteen markers were missing. In complete disregard of his signals and of unavoidable accidents, the executives of the Ob' and Irtysh Basins' Waterway Administrations are not taking any decisive measures to eliminate the defects on this highly important shipping route.

The Novosibirsk Branch of the "Glavneftesnab" (The headoffice of the Transport and Supply of Oil and Petroleum Products) is equally guilty of slowing down oil shipments. It has delayed much too long the construction and equipment of the second jetty at Krasnyy Yar. At first it was supposed to be put into operation on the 25th of May, then on the 1st of June, later on the 10th of July, but even to-day it is far from being ready. Often, one can see five to eight barges standing there idly, waiting to be filled with oil. In one month alone this demurrage has amounted to 126 thousand tonnage-days.

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The chief of the Shipping Agency's "URS" (workers' supply office) P. SOTNIKOV, is extremely irresponsible as far as the personal needs of the oil-transport personnel is concerned. The crews of oiler vessels receive their supplies in Krasnyy Yar and Kolpashevo, but as a rule, the bread they get is old and dry, meat is seldom available, and it is absolutely impossible to obtain dairy products or fresh vegetables.

Vodnyy Transport
6 August 1966
page 1
(Full text)

The Vishera Diamond

PERM'. Twenty-three carats is the weight of the precious crystal lifted yesterday from the bottom of one of the tributaries of the river Vishera by the dredger of the placer "Uralalmaz" (Urals Diamond). Throughout the entire course of the 25-year history of the commercial mining of diamonds in the Urals it happened only once that an even larger crystal -- weighing 24.5 carats -- was found.

Sovetskaya Rossiya
6 August 1966
page 1
(Full text)

Snezhnogorsk: the Builders of the Arctic Hydro-Electric Power Station are Competing

A hydro-electric power station will be built here in the permafrost zone. In the blueprints of this project the new GES (Hydro-electric power station) bears the name of the Arctic river Khantayka. A unique construction site is appearing on deserted shores near the confluence of Khantayka with the mighty Yenisey, at the point where the waters storm through enormous rapids. For the time being, preparatory work here is in full swing on a wide front: the construction of roads and communications. A lumber-made settlement for workers, called Snezhnogorsk, has sprung up; in the future it will grow into a city.

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Hundreds of young enthusiasts have already arrived here in the tundra of the Taymyr National Okrug. They have settled-in and named their streets. Most of them are veteran builders.

Trud
10 August 1966
page 1
(Full text)

The Master Plan of Murmansk

The RSFSR council of Ministers confirmed the master plan of the city of Murmansk as ammended by the "Giprogor" (State Institute of Design and Planning of Cities) and approved by the RSFSR "Gosstroy" (State Construction Committee) and by the Committee for Civil Construction and Architecture at the USSR "Gosstroy". The master plan provides for a number of new town-building projects aimed at the improvement of labour, living and recreation conditions for the city's population.

The construction of high-rise multiple dwellings in the city is to be expanded, the existing centre of city-wide importance is to be developed further, and the creation of social centres in the city's central and residential areas is to be taken under consideration.

Sovetskaya Rossiya
11 August 1966
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(Full text)

Golden Harvest

The old bed of the stream Shumnyy of the "Gor'kiy" gold field has been famous since olden times for its nuggets. This was the very place where a nugget weighing 3,200 grams was found in the forties. It is certainly no accident that the placers in the stream Shumnyy are worked by hydro-elevators during the current panning season.

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To-day, one 1,342-gram nugget, 45 nuggets weighing 150 to 700 grams, and about 50 smaller ones were taken from the hydro-elevator No. 3, operated by the team of Leonid RUBTSOV. Nuggets weighing up to 200 grams are frequently obtained from other hydro-elevators. The gathering of the golden harvest is continuing.

Sovetskaya Rossiya
11 August 1966
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(Full text)

The Siberian Scope

Much attention has always been given by the Soviet State to the development of the Siberian economy. The growth of productive forces in the regions east of the Urals is an uninterrupted process. However, in the immediate future its development will proceed on a new scale. Siberia will become a powerful industrial complex, the greatest citadel of the USSR economy.

The time is ripe for Siberia to assume its great role. Already now its eastern industrial complex has powerful centres of coal, metallurgical, machine-building, construction and chemical industries. In its perspective, Siberia will assume a firm position as the main base of the union-wide production of the most important types of industrial output.

The industrial potential of Siberia will be expanded immeasurably as a result of the exploitation of oil and natural gas deposits. The explored reserves of these most economical thermal energy agents and raw-material resources for the chemical industry are so great that it has become possible to revolutionize the process of re-arranging the fuel and power balance of the Urals and of the Central, Western and North-Western regions of the USSR, as well as to alter the overall structure of fuel consumption.

The main task now is to develop these resources quicker, to create and to add new production capacities to the general funds of the oil and gas industry.

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Unfortunately, nature does not let man have its treasures without a struggle. Enormous energy and intelligent creative efforts, supported by all the latest technical means, are needed for their acquisition. Practically two fifths of the territory in the Tyumen' Oblast's zone with the largest deposits of oil and gas, in the middle reaches of the Ob' river and, particularly, in the northern regions is covered with swamps, taiga and tundra. In order to take possession of nature's riches and to achieve his aims, man has to overcome impassable expanses, permafrost and survive in terrible cold and blizzards.

And here is our problem: how can human effort be made easier, more effective and productive, what should be undertaken in order to prevent dissipation of the greatest wealth -- human effort? This problem gives rise two matters of principle: firstly, concerning the technical, or, more exactly, the technico-economical, and secondly, the social and living conditions.

The solution of the first problem matter lies in the raising of the cultural level of direction and management under northern conditions. All types of labour is priced much higher here. In the first place, therefore, it is necessary to avoid mechanical repetition of the methods of direction and management which have become habitual under the specific natural and economic situation of the Siberian North, and to refrain from using equipment devised for different, more favourable conditions in the centre and the south of our country.

We are, of course, working on the problems of the North. But how? One perceives a certain indifference, slowness, but time is not waiting. The construction of singularly large gas pipelines from the deposits in Tyumen' towards the West will soon be started. What has actually been done in order to supply the gas-works with equipment, implements, fittings and instruments of the co-called "northern design"? Have the frost-proof materials been tested in actual use, etc.? Not so far.

The organizational level of production in these parts of the country is far below that of the non-northern regions. How does it manifest itself? First of all, by the fact that, despite high cost of labour caused by local conditions of nature and economy, the rates of mechanization and automation of production processes do not exceed but, on the contrary, are lower than those in the economically developed "old" oil-producing regions. The absence of permanent means of communication, no matter how primitive, makes itself felt. The delivery of freight and workers to the fields and drilling outfits by aircraft and helicopters is a normal occurence. But in poor weather even these expensive methods of transportation cannot assure an uninterrupted execution of the work of exploitation, drilling and construction.

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The most complex problems are the social and ordinary domestic ones connected with the exploitation of natural resources in the North. The 23rd Congress of the CPSU pointed out the necessity of enhancing the material interest of people sent there to work. And the CPSU approved decision must impel the administrative organizations to change their attitude towards this aspect of the problem.

Well qualified workmen, trades people and specialists have been summoned to the Tyumen' Oblast' from the well-organized towns and settlements of the Bashkir and Tatar republics, from Perm', Baku and Groznyy.

But many specialists who came to Tyumen' have now gone back to their former location. Who will replace them? Locally trained personnel? But it takes time to train them. Consequently, the right policy here should be to secure more permanent employment for well qualified "brought-in" personnel and, at the same time, to expedite technical and in-job training of local workers.

In these northern regions, with their hard working and living conditions, first and most urgent priority must be given to the creation of more comfortable, well furnished living quarters, to the construction of schools, children's homes, medical establishments, clubs and motion-picture theatres. The North must not be known as a sparsely populated island, completely isolated from the life of the entire Soviet Union and from its great culture.

This, of course, gives rise to the scale, or the scope of the whole matter. In many northern regions there is a shortage of rooms in hotels, not enough space for children in nurseries and even schools, there are line-ups in polyclinics, young people have no sports facilities. Why? Some of our administrators have lost the sense of scale, of scope. Our present-day planners are afraid to spend an extra rouble on any non-producing ventures. And then what? To satisfy the demands of living, these public facilities will have to be planned and built after all. The economy factor turns out to be false and brings nothing but losses.

The crux of the matter is the development of unequalled deposits of oil and gas. It would seem that each of the Ministries of Transport Machine-Building, of Motor Transport, of Public Health, and others, bearing in mind the overall interests of the state, and disregarding the departmental interests, should, without a special invitation, find ways and means to participate actively in this tremendous undertaking. But, in actual fact, whenever the matter at hand concerns oil, let the Ministry of Petroleum Industry think about it, or if it concerns gas, -- of Gas Industry. As for all the other ministries on the authority of which depends the construction of roads, of means of communication, of cultural, living and health institutions, they simply stand aside.

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This attitude must not be tolerated when it concerns the richest deposits of raw-material and fuel resources of Siberia. The whole country is investing much capital for their development. And it is the duty of every state authority, which is taking part in the creation of a new strong citadel of our economy in the East, to organize the whole undertaking in such a way as to enable people who transform these means into material wealth to do their work with maximum efficiency. The author of this article was: I. Karyagin, Doctor of Economics.

Sovetskaya Rossiya
14 August 1966
page 2
(Slightly abridged)

Power Station on a Frontier River

The Norwegian firm "Norelectro" has to-day started the construction of the Khevoskoskinsk hydro-electric power station on the frontier river Pas. This is the second station after the one at Borisoglebsk which is being built jointly by the Soviet and Norwegian power experts.

Sovetskaya Rossiya
17 August 1966
page 4
(Full text).

Currency Shop. Report

The gold-field "15 Years VLKSM" of the Bilibinsk Mining Branch of the "Severovostokzoloto" (North-East Gold) Amalgamated was first in the Magadan Oblast' and throughout the Russian Federation to fulfil the annual plan of gold production. The harvesting of gold on the ranges of Vstrechnyy still goes on.

The slogan of gold miners there is: "We have the Plan! Let us get 9% of metal in excess of it!"

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The Party organizer, an experienced miner Mikhail KALINICHENKO, and the section superintendant, mining engineer Vyacheslav SHTAN'KO, were showing us the hydro-elevator in operation. The hydro-gun, handled by Vasiliy KOKHAN, was cutting right through the huge lumps of sandstone with its tremendously powerful jet of water, washing out of it the precious bits of gold.

At a slightly higher level a team of bulldozer-operators, with Vasiliy TARASOV in charge, were taking off the "shirt", i.e. removing the top layer of soil in preparation for next year's season. One must hurry while the miserly northern sun thaws off the permafrost.

Higher still the assembly work on a hydro-elevator is in progress.

"Every minute counts!" -- says Shtan'ko as he looks around him. "if we assemble all the hydro-elevators before winter, we shall save about thirty thousand roubles. Thus, we must hurry. Winter is at our heels..."

The Party organizer takes over, saying: "Despite the fact that gold is lying around under our feet, we must keep track of our money even here in the North. Not long ago we made a calculation and found out that the lumber for props in underground shafts cost us 80 roubles for one cubic metre. It comes from the "continent". Is there no way of organizing the provision of lumber locally, on our own? We dispatched a team of lumber-men to the river Anyuy, and our expenditure for props was reduced 4-fold immediately..."

They certainly know how to count **here**. I became firmly convinced of that when I talked to Vadim SAVCHENKO, the director of the gold-field.

He used to be the first secretary of the Magadan Komsomol's Oblast' Committee. He also brought the first builers into this region. The tents were soon replaced by well-built houses. A club, a dining hall, a store, a school and a kindergarten were soon under construction. The mains of a heating system and of water supply were laid...SAVCHENKO often visited the settlement until, in 1964, soon after the gold-field was put into full operation, he arrived there to stay.

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"Many people are trained here, and this helps us to find ways and means to lower the production costs of gold".

Savchenko takes a pencil, and columns of figures appear on a clean sheet of paper.

"This year", -- says he, "we have cut down the production costs of one gram of gold by 9%. But this is only the beginning. Electric power is much too expensive."

Then I recalled my conversation on the range with bulldozer-operator Yuriy RODIN. His general opinion of the machine built by the Chelyabinsk Tractor Plant was good, but he also thought that it was a bit too weak for the North. It was necessary right from the start to reinforce parts exposed to sand friction. He wrote about it to the Chelyabinsk plant, described the weak points of the machine, but he never received a reply.

"Rodin is absolutely right", -- was Savchenko's opinion. "Additional expenditures on bull dozers, which are supposedly ready for operation, raise the production costs of gold. Those men in Chelyabinsk should take into consideration our comments and design a northern type of their machines".

His Komsomol activities have left their mark on the director. He cannot refrain from talking about people. He was telling me with enthusiasm about what had occurred early in July when the ranges were flooded by rain water. Dams were washed away, and the situation was critical. Some people considered it advisable to stop the operation for three or four days. But the workers made a different decision: bulldozer-operators Vasiliy TARASOV, Vladimir MATENKO, and others, in short, all crews did not leave the range, not even for an hour. Many of them worked two shifts in a row. But they kept the range in operation! The author of this article was: I. Grebtsov.

Sovetskaya Rossiya
20 August 1966
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(Slightly abridged)

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A City Beyond the Clouds

YAKUTSK, 22 August ("Trud" correspondent). A shroud of leaden clouds covers the spurs of the Dzhugdzhur, the mighty mountain range in the Eastern Yakut land. Rain began to beat down on the roofs of houses in the gold fields of "YNYKCHAN". But foul weather almost never comes to the construction site located above...the clouds. A new city in the Far North, named Solnechnyy, is rising atop one of the gigantic ledges of the mountain ridge.

The history of its foundation is very interesting. Prospectors have explored an area of hundreds of square kilometres. And all samples taken from the depth of the permafrost layer contained glistening grains of the "noble metal". Houses on gold foundations?! Well, the builders had to climb above the clouds...

Only a short time ago the chief of the construction bureau M. LEBEDEV, the professional engineer Ye. MALKOV, the carpenter N. TITOV and their comrades were putting up their canvas tents way up in the skies. But to-day, two-storey multiple dwellings stand and the first street stretches out in the city beyond the clouds. A house warming party took place in the sixteen-apartment building. Foundations are now being laid for four and five-storey stone structures which will, for the most part, consist of living quarters. A school, a House of Culture, a motion-picture theatre, a hospital, public-facilities units, a store and a cafe will soon be constructed in Solnechnyy.

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23 August 1966
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TRANSPORT AIR

Wings Over the Arctic

The Day of the Air Fleet of the USSR has now a special significance to the conquerors of the blue heights. Our native land has just entered the first year of the New Five-Year Plan. The Soviet nation is experiencing a great upsurge of labour activities in response to the decisions of the 23rd Congress of the CPSU. To-day one does not merely wish to tell a story about the prosaic side of our daily life but to glance into the future... Actually, it is just on the verge of its beginning.

The years of the Seven-Year Plan were years of swift and impetuous development of civil aviation. The routes of the "Aeroflot" over the fifth ocean have now a total length of about half a million kilometres. One hundred thousand of them are international. It frequently happens that in one day over 200,000 people are being carried by aircraft. This figure urges one to recollect that in 1937 approximately the same number of people were transported by air in our country during the whole year, while last year -- 1965 -- forty-two million have made use of air transport. Aviation has become a reliable and irreplaceable aid to builders, sailors, fishermen, river-transport workers, geologists, polar explorers, oilmen, scientists, agricultural workers... A huge area, still sparsely populated but developing with seven-league strides, has been entrusted to polar aviation. Through this area passes the Northern Sea Route -- an important transport artery connecting the Atlantic and the Pacific oceans, the Arctic seas, and the great Siberian rivers. Gold and diamonds are mined, oil is extracted, new settlements, cities, industrial enterprises, and ports are springing up in that area. Thanks to airmen, the Far North has passenger-line connections with all large centres of our country. Scarcely twelve hours are needed to "step across" from Moscow to Chukotka or vice versa.

Ice reconnaissance, so indispensable to navigation, has been assigned to our airmen. The Northern Sea Route channel demands in summer an uninterrupted observation of the debacles of ice-fields. The air scouts have a single but constant "general" mission: to find the most vavourable passages for ships. Ever since the opening of the current Arctic navigational season much useful work of particular benefit to seafaring has been done by crews commanded by A. KORSHUNOV, S. SKORIK, V. MAL'KOV, P. BARANOV, and V. TSUTSAYEV. Having adopted the methods of those who had developed the basic tactics of ice reconnaissance, the young pilots V. MAZUROV, V. YERMAKOV, Yu. SHNEYDER, Yu. KUTIN and Ye. KUDRYASHOV are doing much skilful work.

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Every spring the stillness of high latitudes of the Arctic ocean is broken by the roar of aircraft engines. Dozens of aircraft and helicopters appear in the Arctic sky. Tent camps of airmen and scientists spring up on drift-ice. The current high-latitude expediton "Sever" (North) commences its operations. Airships transport into the Polar basin hundreds of tons of equipment, implements, foodstuffs, fuel... Planes deliver new replacements of researchers to the drifting scientific stations "Severnyy polyus" (North Pole) and deplane polar explores on the islands.

Flights into the Central Arctic regions are made not only by piston-engine aircraft "Ll-2" and "IL-14" but also by turboprop-engine air ships. The crews of "AN-12" aircraft often take off from shore bases and then confidently land their heavy machines on drifitng ice in high latitudes. One of these planes can deliver in one flight just as much freight as the "IL-14" aircraft could do in six flights. During the last "Sever" expediton the work of crews commanded by M. FILIPOV, V. GERASIMOV, A. MIRSHAVKA, M. STEKOL'SHCHIKOV and by others was done successfully. The itensification of flights is evidenced by the fact that this spring more than four thousand landings were made on drift-ice.

Flying light aircraft "Ll-2" and "AN-2", equipped with skis, airmen see to it that Soviet scientists have all they need to do the work of exploring the Arctic and the Antarctic. Thousands of landings are made by airmen together with oceanographers on the ice-fields of polar seas. They install drifting automatic radio-meteorological stations and radio-rods which transmit information to the mainland on the weather, currents and the shifting of ice.

The presentation of our activities would be far from complete if nothing were said about our participation in the industrial development of the Far North. In winter, under the polar-night and severe-frost conditions, airmen have delivered thousands of tons of important freight to Surgut and Tarka-Sale. The "AN-12" aircraft have transported machine-tools and equipment, tractors and automobiles. Urgently required goods have been brought in to be used by diamond miners, oil-men, and in the gold-fields of Chukotka. In the course of these difficult air operations, high-level efficiency was demonstrated by the crews commanded by A. SUKHOV, A. USHAKOV, F. SKLYAR, S. KHOLODNYAK, B. SHVEDOV and by many others. There is plenty of hustle and bustle in summer, also! Sometimes aircraft have to make up to seven flights a day to the Far North in order to supply the population with tomatoes, apples, grapes, etc. In July alone we have transported five hundred tons of vegetables and fruit, but our predicted total will probably reach two thousand tons. Ahead of us are many more flights which will bring joy to the inhabitants of settlements, towns, and enterprises in far-away border areas of our country.

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This is the situation to-day! And the fact that, in spite of difficult Arctic conditons, all assignments are carried out successfully must be put to the credit of the great collective body of polar aviation personnel. Among those who serve as examples for the young generation we find such airmen as P. MOSKALENKO and B. OSIPOV, who have been awarded the lifty title of "Honoured Pilot of the USSR", A. POLYAKOV, Ya. DMITRIYEV, B. MIN'KOV, N. STEPANOV? V. KUZ'MIN, B. MAYOROV, G. BARDYSHEV, I. BARANOV, N. YURSKIY, L. KLYUYEV, V. PEROV, S. RYZHOV, V. VALEVICH, M. FRENKEL', N. KRIVOSHEYEV, A. KUZNETSOV, I. PARSHIN, et al. Such strongly knit together generations are a good omen for our future which promises to be more brilliant, more interesting and more diversified.

The Civil Air Fleet will soon be replenished by new dependable and comfortable craft. The "TU-104", which has so excellently proved itself, will make way for "TU-154". Three turbo-jet engines in its tail assembly will enable it to develop a speed of up to 900 kilometres per hour. This aircraft has the most up-to-date aero-navigational instruments including automatic landing equipment. We anticipate that, towards the end of the current Five-Year-Plan period, "TU-154" will replace "IL-18" on the flights to Tiksi. Passangers will be whirled away by the "IL-62" which can lift 186 people into the air. The speed of this aircraft amounts to 850 -- 900 kilometres per hour. Its flying range with a maximum supply of fuel and a payload of 10,000 kilograms equals 9,200 kilometres. We hope that this craft will bring the flying between Moscow and Anadyr' down to seven hours.

Polar airmen are also "eyeing" the "Antey" -- the new Soviet transport aircraft. The giant "AN-22" can take aboard eighty tons of freight and transport it over a distance of 5,000 kilometres. With a load of forty-five tons it can fly, without landing en-route, 11,000 kilometres. It goes without saying that the Arctic is in dire need of such a "Hercules". The body of experts, headed by the outstanding Soviet constructor O. ANTONOV, have a great job outlined for them. Their efforts will make it possible in the not too distant future, to reinforce the air fleet of our polar aviation with powerful aircraft. But we do not forget our "oldsters" either! They have made a real name for themselves in the Far North. Their number includes also the "AN-12". We, together with those who designed that craft, are at present testing it on skis.

Firmly determined to improve our services to scientists and sailors, we are interested in new aircraft which are due to replace "IL-14", "AN-2" and "Ll-2". We particularly like the excellent aircraft "YAK-40". It has three jet engines in the tail unit of its fuselage which enable it to develop the speed of up to 600 kilometres per hour. This craft can be usefully employed in ice reconnaissance and on local passenger lines in the Arctic.

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Only a few short years have passed since helicopters became an integral part of the polar aviation's fleet. They have shown themselves in their best light. But we are no longer satisfied with "MI-1" and "MI-4". A new powerful craft, the "MI-2", constructed by the group of designers of M. Mil', is likely to be placed at our disposal. It is capable of lifting a television unit into the air for transmitting directly to the captain's bridge visible data on the condition of ice-fields surrounding his vessel. It is not difficult to realize that the application of television and electronic devices will enable ship captains to avoid the forced stand-stills of their vessels and to guide convoys in any weather.

Vodnyy Transport
18 August 1966
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(Full Text)

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TRANSPORT RAIL

On the New Track of Courage

From early in the morning till late at night, the rumble of excavating machines and the roar of dump trucks fills the air incessantly on all sections of the Tyumen' -- Tobol'sk -- Surgut rail line. Machine-operators, who have acquired their production know-how on the road of courage, Abakan -- Tayshet, are working here.

Neither the mired roads in the spring, nor the frequent rains in July were able to dampen the ardent enthusiasm with which the builders went about their tasks. Low-lying places turned into swamps, motor roads became impassable. But people were determined to reach the target: to finish the subgrade and to lay the rails to the station Tarmana this month, as provided for by the plan. In order to cope with this difficult task, the "Tyumenstroyput'" (Headoffice of the Tyumen' Railroad Construction) engineers defined, with the aid of the network map, the most crucial route, and considered a **contiguous** development of three stations: Voynovka, Promyshlennaya and TETS-Manevrovaya. The machinery and workmen were allocated to the objectives on the crucial route, and concrete tasks were assigned to all teams.

The successive order of construction work was as follows: buildings, subgrade, rail bed, the laying of rails, ballasting. The most difficult job under the bad-roads conditions turned out to be the building of the subgrade. The experience acquired on the Abakan -- Tayshet line helped the chief engineer, Fridrikh Il'ich PASHKO, to appraise the situation in his section correctly, and it helped in the most advantageous disposition of the excavation machinery.

Pashko made a thorough study of the terrain configuration, found a way of reducing the distance over which fill had to be transported for building-up the embankments, and devised the best possible method of using scrapers in earth moving operations. The sunburnt chief engineer, with a paper-case in his hands, visited his mechanized teams several times during every shift. He had organized two shifts for field work and a third for the preventive inspection and repair of equipment. "Our machinery has to last out not only this year but also a good part of the next" -- the machine-operators were saying.

Skilful mastery of their trade on this construction project was achieved by the excavator-operator, comrade RADCHENKO, who fulfils his monthly quotas by 135 - 140%, and the scraper-operator, comrade SEMILEV -- by 120%. The bulldozer-operator, comrade CHERVYAKOV is following their example.

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Aided by the engineer N.A. YEROCHIN, the team of comrade ZELINSKIY developed a semi-automatic section-assembly line. Almost all processes of linking-up track sections are done without manual labour. The hard work of railway builders has been mechanized here. The semi-automatic section-assembly line has been officially approved on the construction project Tyumen' -- Surgut. The significance of such an innovation cannot be evaluated too highly.

The operator Lev AVERBUKH has learned the new method to perfection and became a senior master of the line. There are many such people on this construction project, and their ranks are growing from day to day. Their heroic labours inspire all workers to a mass effort. The author of this article was: Engineer A. IVANOV.

Gudok
9 August 1966
page 1
(Full text)

On the Wild Bank of the Irtysh

... After the October revolution, Western Siberia began to serve entirely different purposes. Our geologists found many extremely valuable deposits of coal and non-ferrous metals there. And after the last war, prospectors began to look for oil. A tall derrick appeared on the outskirts of Berezovo. Its workers had left many empty wells behind them. Suddenly, during a night in 1953, a dreadful rumbling sound was heard at the edge of Berezovo. A huge fountain of water, and gas gushed out from under the derrick. In a moment the diesel power plant was buried, and the lights went out. But the fountain was rising higher and higher. The whole settlement was awakened. Eager to find out what had happened, the inhabitants ran out of their houses into the darkness.

By morning Berezovo was famous. The whole country was told that underneath a huge deposit of gas was discovered for the Urals, which needed fuel so urgently.

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The former Tobol'sk Province, now Tyumen' Oblast', turned out to be fabulously rich in fuel. This discovery was followed by others when open-flow deposits were found in Ust'-Balyk, Surgut and Megion. The map of the Tyumen' Oblast' now shows more than fifty oil and gas springs, and their number is still growing.

The impassability of the taiga is the only obstacle which to-day stands in the way of the development of the fantastically oil - and gas-rich deposits of Tyumen'. Just look at the map: the huge area between the Tyumen'--Omsk rail line and the Kara sea is bespeckled with short horizontal lines which indicate swamps. An endless bog stretches over thousands of kilometres.

Nevertheless, some of the taiga gas is already on its way to Serov in the Urals. The oil pipeline Shaim -- Tyumen' is finished. The builders of new oilmen's enterprises, settlements and towns are ready to extend the oil and gas delivery even further westward, into the centre of our country, and eastward, in the next few years. But to do this they must overcome the incredible difficulties of the impassability of roads.

The builders do their best to have the main bulk of their equipment and supplies brought into the taiga in winter. For example, I had an occasion to see what was being done on the road Tyumen' -- Tobolsk in March of this year.

Strictly speaking, one should not say road. It was rather a trench cut in the snow by bulldozers, barely wide enough for two cars to pass each other. Thousands of trucks were moving northward. With their engines roaring, many "ZIL", "MAZ" and trucks of other makes carried all kind of loads -- pipes, excavators, fuel, reinforced-concrete blocks, structural steel, pre-fabricated huts, machine tools, food stuffs, working clothes, i.e., everything without which the development of a wide uninhabited region is unthinkable.

When the leading vehicles made some progress, and the din of engines died down a bit, a mighty roar would resound in the skies. Hard working helicopters, without which the Tyumen' landscape cannot even be imagined to-day, were flapping their wings up there. From time to time one could hear the roar of an aircraft flying along the road-way to the north.

At that time I was travelling with the secretary of the Tyumen' Oblast Committee, Yeveniy Andreyevich OGORODNOV. Looking at the heavy traffic on the road, he said:

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" It is almost impossible to travel here in summer; the ground is to soggy and there are too many water crossings. As soon as the navigational season opens, we do our best to ship everything by river transport; on the Tura to Tobol, on the Tobol to Irtysh, and from there to ob'. But towards the middle of July the river Tura becomes too shallow, and Tyumen' finds itself again cut off from the north."

OGORODNOV came to Tyumen' as the construction-superintendant of the first thermal station of the region. As soon as the smoke started pouring from its stack at the edge of the town, he was elected to the office of the "Obkom" (Oblast' Committee) secretary in charge of industrial matters. A professional engineer, builder, and economist, he expressed what he had been deeply concerend with for a long time, and which has also been written down among the directives for the Five-Year Plan:

"What is needed is a railway. Without it we cannot get at the oil!".

So, this railway is now under construction.

Last winter, frozen ground had to be blasted in quarries by the explosvies handlers from the mechanized column No. 21 of the "Uralstroymekhanizatsiya" (The Urals Construction Mechanization) trust. Regardless of the cold, the excavator-operators, comrades CHUYAKOV, YEROV, MASHTAKOV, KNATOV, YANUSHKEVICH and SERGEYEV removed many metres thick layers of peat from the future road-bed, and started dumping the first few cubic feet of fill for the sub-grade.

Tyumen' -- Tobol'sk is the first-priority sector. In addition to the leading tran No. 38, the column No. 21 and the bridging train "SMP" (Con-construction and Assembly Train) No. 237 are coming from Tyumen' to meet them. Between them five other columns, the "SMP" No. 269 and the experienced team of the construction foreman, comrade MATVEYNIKOV, are hard at work in their sectors.

The track will be 692 kilometres long. About 46 million cubic metres of fill will be needed for its sub-grade. Forty-four stations and side-track points, 413 man-made structures, including twelve large and eighteen medium-size bridges, will have to be built between Tyumen' and Surgut. By the way, the bridge on the Irtysh river near Tobol'sk will be about one thousand metres long and together with approaches it will measure five kilometres.

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The Five-Year Plan calls for trains to reach Surgut by 1970. By that time this small settlement is bound to grow into a modern city of two hundred thousand inhabitants.

Tyumen' and Tobol'sk have to be joined by a track of steel by the end of next year. A graphic chart of work schedules has been prepared for the project. Train traffic to the station Tarmany is to be opened in August and to the future station Torgili -- in December. The author of this article was: N. Dubinin.

The Line Tyumen' - Tobol'sk - Surgut

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Starter Line Through the Taiga

The builders of the new road of steel, Ivdel' - Ob', set up their temporary camp in 1959, on the bank of the wide river Loz'va. This river was the first barrier on their path. Cold, slanting rain beat on the faces of the bridge-builders, the wind swayed the booms of the pile-driving machines, and the river's level rose from day to day. The bridge-builders, supervised by the Communist CHEVGANOV, had to work around the clock...

Six days later an almost 200 metres long bridge spanned the river. The way to the East was now open to the builders of the Ivdel' --Ob' line.

The construction of that line is now in its seventh year. People have to fight the taiga for every metre of the line. They were not stopped either by 50-below frosts, or by rivers and swamps, or by the hordes of mosquitoes. The new line is being built under difficult climatic and geological conditions. The track must be laid through terrain very similar to that of the Far-Northern regions. There were long stretches where it was nearly impossible to find some earth which could be used as fill for building-up the road-bed, whereas the cuttings had to be led through cavernous terrain. Throughout the entire length of the 370-kilometre line there were practically no inhabited localities.

While fighting against the severe nature of the North, people were hardened, gained in strength and stubbornly forged ahead, towards the next picket. The whole construction community knows well the names of such front-rand construction men as comrades FINASHIN, VERIGIN, CHECHEBA, PUSTOVALOV, DRUZHKOV and many others. These Communists and Komsomols have laid 350 kilometres of steel across the virgin taiga, have erected 24 railway stations and many workers' settlements, have installed communication and power-transmission lines.

Lumber camps, loading sidings, branch lines, motor roads, and the gas pipeline Igirm -- Serov were built at the same time as the main rail line.

Trains run day and night on the new rail-road. Powerful diesels bring train loads of lumber from the Urals and Siberia, to the station where the new line joins the network of the "MPS" (Ministry of Railways), and take away pipes, construction machinery, gas-pipeline materials, and materials for new settlements.

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The first-year plan of the Five-Year period provides for 220 kilometres of the new line to be put into permanent operation during the third quarter. The finishing work is in full swing in the shorter section. The Severodlovsk road is extremely helpful to the builders. Its director is Comrade YEGOROV. He is helping out with well qualified master road-builders, signal-men, and water-supply experts.

On this northern line the body of workers, many thousand-men strong, exert all their strength to complete the finishing work and to make all the arrangements for putting the line into operation exactly on schedule.

Gudok
14 August 1966
page 3
(Full text)

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TRANSPORT ROAD

Road is Under Construction

An asphalt highway, 240 kilometres long, is under construction through the steep mountain slopes and the deep gorges of the Western Sayans into the very heart of Tuva. The new road Abaza -- Ak-Dovurak will soon be the main artery of this Region. Some sections of the road are already open to traffic, but by the eve of the 50th Anniversary of the October revolution the entire highway will be fully operative.

Trud
13 August 1966
page 2
(Full text)

The Highway Murmansk-Leningrad

On that side of the Kola peninsula the builders of the motor highway Murmansk - Leningrad came close to the borders of Karelia. At present the mechanized teams are dumping fill for building up the roadway in the Kandalaksha - Loukhi sector, where they have to lead the track through impassable swamps and across innumerable water barriers.

Blasting experts, bulldozer operators and dump-truck drivers are very busy. A photograph taken in the Kandalaksha - Knyazhaya sector shows the men of the mechanized column No. 101, which is working on the new highway.

Stroitel'naya Gazeta
26 August 1966
page 2
(Full text)

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TRANSPORT WATER

An Important Factor which Ensures that Ships Follow the Most Advantageous Routes in the Arctic Seas

Centuries old experience has convinced seafarers that to follow the shortest possible routes between various points is far from the most advantageous way of getting there. Head winds, currents, rough seas, and poor visibility prolong the time of passage of a ship sailing on the shortest possible course and, besides, are perilous to navigation. Increasing gradually their knowledge of the hydrometeorological characteristics of oceans and seas, sailors began to take advantage of tail winds and fair currents. Guided by the mean data collected in the course of many years on the hydrometeorological phenomena, as well as taking into consideration their seasonal deviations, seafarers have established the most advantageous sea routes between principal ports.

However, the hydrometeorological navigation conditions are changeable. Ships are liable to run into unfavourable hydrometeorological situations whenever they follow the many years old mean course, or the recommended seasonal route. Hence, during recent years, a constantly greater attention is being given the selection of the most advantageous route for each individual ship or for a group of ships. The selection of this route is, of course, impossible without knowing the existing hydrometeorological conditions, or those expected during the voyage.

For a good many years now in the Arctic every convoy, or even single ships have been using routes with the most favourable ice conditons. The choice of the route in the Arctic Seas depends on the quantity and quality of ice on it, and on how closely the ice is packed, how far it is disintegrated, how heavily it is hummocked, how thick it is, and on the size of the area it covers. These are the very elements which also determine the start of navigation in various Arctic regions. Because of the instability of ice conditions in the Arctic seas, the starting times and the routes of navigation differ from year to year. For example, in July, on the northern shore of Chukotka, the navigational route follows mainly the shore line. But in the second half of the navigational period (end of August -- September), in a number of cases, ships can sail more successfully just below the southern shore of the Wrangel island and through the central part of the Long Strait.

Ships can sail along the least dangerous and most favourable routes in Arctic waters only if they are fully aware of the expected hydrometeorological situation. Important factors, on which the safety of their voyage depends, are the short-term (1 to 10 solar days) and long-term (3 to 6 months) ice and meteorological forecasts and the ice air-reconnaissance.

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The long-term ice forecasts for the Arctic seas are prepared in the Arctic and Antarctic Scientific Research Institute and are used in the compilation of the plan for sea-going operations in the Arctic and the fixing of the opening dates for navigation on any section of the Northern Sea Route.

The short-term ice forecasts are indispensable in performing actual operations connected with the piloting of ships. The ice air-reconnaissance is conducted regularly in the navigational area. It supplies information on the distribution and nature of ice. The actual ice situation and its alterations are taken into consideration in the selection of the safest possible and most favourable route for convoys and individual ships. The air-reconnaissance is repeated and additional recommendation are given whenever this is warranted by complex ice conditions. Ships are piloted by aircraft or helicopters while they negotiate the most difficult sectors of the route, heavily obstructed by ice.

The many years of experience in conducting sea-going operations in the Arctic have shown that the existing system of organizing navigation there has fully proven its worth. Naturally, it has been established not all of a sudden but in the course of several decades. Its advantages become particularly obvious when compared with the navigational conditions in the twenties. In those days, ships used to sail the Arctic seas almost blindly, without any knowledge of the ice conditions. And the only choice of the route then was the inshore line. To select the most safe and favourable route was at that time completely out of the question. Quite often voyages ended up by ships remaining ice-logged for the winter. These days dozens of ships ply the Arctic seas in the course of a navigational period. Ships are piloted through route sectors with difficult ice conditions by powerful modern ice-breakers "Lenin", "Moskva" and "Leningrad". This does not relieve the ship-handlers of the necessity to select the most favourable sea routes. In a propitious situation the ice-breakers will bring a convoy into a port faster, but even they cannot overcome the hummocked polar ice obstructing the route. This has been confirmed by the experience gained during the 1965 navigational period. To select a route in ice-fields, a passage through which can be cleared by powerful ice-breakers, remains, therefore, an indispensable precondition to the piloting of ships in a difficult ice situation.

Undoubtedly, even despite a well organized system of providing services to the fleet, errors are liable to occur occasionally in the selection of the most advantageous route. They may be made as a result of insufficiently complete information on the state of ice-fields or of erroneously forecast weather and mistaken ice distribution.

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The methods of short-term ice forecasts are far from perfect. Improvements in the existing and the elaboration of new methods of forecasting ice conditons in the Arctic seas will lower the probability of errors in the selection of the most advantageous routes for ships and convoys through icebound waters. The author of this article was: Yu. GORBUNOV, Senior Scientist of the Arctic and Antarctic Scientific Research Institute).

Morskoy Flot
June 1966
pp. 21-22
(Full text)

The Ob' River Transport Workers are Developing the Shipping of Crude Oil from New Oil-Fields

The directives of the XXIII Congress of the CPSU provide for speeding **up of the economic development** in the West-Siberian lowland and, particularly, for the exploitation of natural resources - the output of oil and gas. A major role in this undertaking belongs to river-transport workers of the Ob' basin whose mission it is to take care of the transportation of cargoes destined for new oil and gas bearing regions and the exportation of crude oil for its transfer by pumping into the main Trans-Siberian pipeline. The tasks entrusted to the entire collective of our shipping agencies call for a sustantial strengthening of their materiel and equipment resources and mobilization of the existing fleet and port facilities.

As a matter of fact, during the last year's navigational period, the shipping agency has increased its freight turnover altogether by 19%; by 11.%5 - on account of the utilization of its internal reserves, and by 7.5% - thanks to the fleet's replenishment. For the first time crude oil was shipped from the Megion deposits in the Tyumen' Oblast' to Novosibirsk, and the deliveries of freight to geological prospectors, oil-industry workers, and builders were almost doubled.

The Ob' river-transport workers and the personnel of the "Glavneftesnab" (Headoffice for the Shipping and Supply of Oil and Petroleum Products) have acquired some experience in the organization of oil shipments using for this purpose, ever since the third quarter of 1965, two steamers of 732 series with four oiler barges of N-459 series of the Ob' Shipping Agency, and three steamers and six barges leased from the Irtysh Shipping Agency.

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First to become fully efficient in the shipping of oil on the river Ob' was the crew of the steamer "Dnepr" commanded by Captain A.I. Poznakharev. Good oil shipping work was performed by the crew of the steamer "Shturval'nyy" of the Irtysh Shipping Agency (Captain M.M. Mironov).

A complex set of measures has been carried out in connection with the operation of oil carriers, the technology of pumping, the loading of oil, and with the completion of documentation.

The shipping agencies's have proven in actual practice the beasibility of maintaining stable and reliable transport connection between the new oil-fields and the largest industrial centres. This transport link turned out to be more effective because it shortens the freight run on the average by 1,000 km and reduces the costs of shipping by almost 40%.

During this year's navigational period, while the construction of the oil peipeline to Omsk is still unfinished, it is advantageous economically to ship crude oil from the Surgut oil-fields (Ust'-Balyk, Belyy Yar, Megion) to Novosibirsk and to transfer it by pumping into the main Trans-Siberian pipeline.

The shipping volume of crude oil, assigned for the first year of the current five-year plan to our shipping agency, has been set at 600 thousand tons, as against 107 thousand tons fulfilled last year. The total freight turnover shall be thus increased by 23.5%, out of which 12% by means of utilizing the fleet's reserve carrying capacity.

A start will be made in the current year in the commercial oil production from the Sovetsko-Sosninsk deposits on the border of the Tomsk and Tyumen' Administrative Regions. According to information of the "Glavtyumenneftegaz" (headoffice of the Tyumen' Oil and Gas Industry), upwards of 60,000 tons shall be shipped from that oil-field. The exportation of oil with the aid of the river fleet from this area may be increased in 1967 to 400,000 tons, in 1968 to 1,000,000 tons, in 1969 to 1,500,000, and in 1970 to 2,000,000 tons.

In this article "The Problems of Tomsk Oil" (in the newspaper "Krasnoye Znamya" /Red Banner/ of 22 March 1966) it was stated that a considerable portion of oil and gas deposits is concentrated in the Tomsk Oblast'. Eleven oil and five gas deposits have been already discovered there, some of which (Sovetsko-Sosninsk, Myl'dzhinsk, Severo-Vasyugansk), judging by their reserves, belong to the large category. The estimated and the known reserves of oil open up vast possibilities for the creation in Siberia of petrochemical complexes. The conversion of Siberian industry to oil and gas will bring about great financial savings and an increased productivity of enterprises.

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In view of this during the current five-year period, the output and the shipping of oil from these districts will grow every year, and this is bound to cause a sharp increase in the deliveries of the required building materials, equipment and other cargoes.

The final review of the 1965 navigational period has revealed a number of shortcomings in the operational handling of crude oil shipments. For example, the oil-transfer pumping station, the construction of which was designed by the Volgograd Planning and Design Bureau of the "Rosglavneftesbyt" (headoffice of the Oil and Petroleum Products Marketing Board of the RSFSR State Planning Committee) was never able to work at its full capacity. From nine to twelve hours had to be spent on pumping out the oil from and on cleansing one 1,700-ton capacity barge. Much time was wasted on the tying up of barges at their moorings and on other preparatory chores.

In the process of making preparations for the next navigational period, a complex set of measures designed to assure the fulfillment of larger assignments has been elaborated and carried out in co-operation with the "Glavneftesnab" (headoffice of the Oil and Petroleum Products Transportation and Supply Agencies).

The most important were: the construction of a second, higher-capacity berth at the oil depot "Krasnyy Yar"; the 30% increase in the capacity of the high-pressure shore pumping station for pumping oil into the feeder pipe of the main pipeline; the allotment of two supplementary 5,000-ton reservoirs for crude-oil storage; the installation of powerful injection pumps on floating pumping stations used for the transfer of crude oil.

These and other organizational and technical measures ensure the availability of berthing capacity in terms of pumping up to 9,000 tons of oil per day (24-hour period).

Currently, documentation is being prepared for the construction of a third oil-pumping berth with the view of putting it into operation in time for the 1967 navigational period.

The collectives of the Novosibirsk, Moryakovsk, and Samus'sk "REB" (Repair and Maintenance Depots) have put the fleet in full readiness for the shipping of oil.

Thirty steamers of 732 series have been equipped with pushing devices and smoke-injection units; seventeen oiler barges and two smoke-injection stations have been made ready for operation.

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During the winter period, the crews of vessels and the shore maintenance personnel have studied special rules governing the shipping of this new type of cargo.

The shipping agency's plan of the operational work provides for the permanent allotment of oil-carrying vessels to the shipping fleet on the line Megion -- Novosibirsk. This line takes care of 75% of all shipments. The rest of the oil will be delivered from the Surgut (Belyy Yar) and the Sovetsko-Sosvinsk oil-fields.

Approval has been given to the most efficient standard train consisting of one pusher tug of 732 series and two barges of N-459 series of 1,850 tons freight-carrying capacity. But, because in the second quarter the shipping agency was short of barges suitable for carrying oil and in order to speed up the turnover of those that were available, we were compelled to lower the shipping capacity and to organize the pushing of single barges. The turnover of trains declined from 16 to about 11 days (24-hour periods) with the result that shipments carried by the same tonnage were increased by 40% as compared with the standard two-barge trains.

The shipping agency has fulfilled the second-quarter plan for the shipping of oil by 105%. However, the profit factor of these shipments has shown a loss of almost 150,000 roubles.

Towards the end of the current navigational period, the shipping agency will have at its disposal 49 barges of N-459 series. This is very little. For this reason we are obliged to put up with such poor utilization of transport equipment and wasteful expenditures. It is essential to assure a speedy replenishment of the fleet's deficiencies, which depends entirely on the operational ability of the Irtysh Shipping Agency to move the required vessels into the Surgut area.

It is the duty of the Chief Directorate of Shipments and Fleet Operation and of the Ministry's Planning and Economy Directorate to examine once more the problem of meeting the needs of the Ob' Shipping Agency in oil-carrying tonnage without allowing it to be used, contrary to its assignment, for shipping diesel-fuel and gasoline on behalf of the Irtysh Shipping Agency.

As far as this is concerned, there are also large fleet reserves tied up in the work of bringing more efficiency into the diesel-fuel and gasoline deliveries to the Surgut area.

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Granted that, due to the lack of a pipeline, the shipping of oil from the Surgut area to Omsk, a distance of 2,200 km, may be justified by the existence in Omsk of a petroleum processing plant, but the shipping of diesel-fuel and gasoline from Omsk to Surgut are, economically speaking, absolutely disadvantageous. It would be considerably more expedient to supply the Surgut area with liquid fuel from the Novosibirsk's oil depot "Krasnyy Yar ", which would entail a ships's run of 1,443 km. It is the duty of the "Glavneftesnabsbyt" (headoffice of the oil and Petroleum Products Supply and Marketing Board) and of the Ministry of River Fleet to decide this matter in favour of releasing a portion of the available tonnage for the purpose of increasing the shipments of crude oil.

These shipments should be carried by tankers of 866 series which shall be loaded with oil for their return voyage. The shipping agency has installed special equipment aboard the steamer "20 let RKKA" (20 years of the Workers' and Peasants' Red Army) for cleansing tankers most thoroughly, to the very last drop of oil in them.

This being the case, the gross productivity of tankers would amount to some 85 t/km per tonnage/day (24-hour period), as against the average of 75 t/km per tonnage/day achieved during the last year's navigational period.

The shipping of ever increasing quantities of oil demands the most urgent construction of powerful hold-cleansing stations, the expansion of the existing refitting facilities, the creation of water areas for riding at anchor and for repairs of the oiler fleet on the Ob' river.

The Novosibirsk Branch of the "Giprorechtrans" (The State Institute for the Planning of River Transport) is engaged in the preparation of documents required for the creatiom of a hold-cleansing complex and for the development of refitting facilities. The principal objective in the solution of these problems is the maximum utilization of the producing capacities of the existing refitting installations, conditioned upon their reconstruction, as well as the building of a joint port and "REB" (Repair and Maintenance Depot) in the town of Kolpashevo.

In our opinion, the hold-cleansing complex should be located in the immediate vicinity of the oil depot "Krasnyy Yar".

At the same time, it is up to the "Rosglavneftesbyt" (headoffice of the Oil and Petroleum Products Marketing Board of the RSFSR State Planning Committee) to allocate funds for the required reconstruction in order to bring, in the course of the current five-year period, the navigational turn-round capacity of this depot's berths up to 2,500,000 -- 3,000,000 tons of oil.

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The Ob' Waterway Administration is faced with great tasks of improving the navigation conditions on the stretch of water between Novosibirsk and the mouth of the river Tom'. This concerns mainly the increase in the guaranteed depth within this sector of up to 2.3 - 2.5 metres, as well as the improvement in the navigational situation on the stretch of water between the village of Aleksandrovo and Surgut. The navigational situation there should be of the same kind as in the upper reaches, a factor which would greatly improve the overall shipping conditions.

It is the duty of the "Glavvodput'" (The Main Waterways Administration) to come to the assistance of the Ob' "BUP" (The Basin's Waterway Administration) by placing at the latter's disposal a sufficient quantity of dredging equipment which would ensure a successful clearing of shoals, restricting the passage of vessels, within the next two years. The author of this article was: V. GASHKOV, Chief of the Ob' Shipping Agency.

Rechnoy Transport
July 1966
pp 3-4
(Full text)

The New Type of Dry-Cargo Motorships for the Lena River

The prototype dry-cargo motorship of 1,000-ton load capacity built by the Zhigalovsk Shipbuilding Yard in accordance with the project 2036 of the Central Planning and Design Office of the Ministry of River Fleet, has been handed over, in 1965, to the Lena Shipping Agency for operation.

The vessel was built as a ship of class "R" of the RSFSR River Registry and is intended for transporting bulk and general cargoes on the river Lena and its tributaries with depths of up to 1.35 m.

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The principal dimensions and specifications of the new motorship are the following:

Rated length	85 m
Rated breadth	12.5 m
Moulded depth	3.4 m
1,000-ton load draught	1.66 m
Passing draught	1.35 m
Number of cargo holds	1
Length of cargo hold	60 m
Width " " "	10 m
Cubic capacity of cargo hold	2,200 m^3
Extent of open deck above cargo hold	97%
Number of crew berths	10
" " emergency berths	1
Ship's stores	for 15 days (24-hour periods)
Horsepower	800
Speed with 1,000-ton cargo	19 km/hr
" without cargo	20.6 km/hr
Dock weight	419 t

The shape of hull in its middle part is flat-bottomed with vertical sides and a curved bilge. The bow is formed by a sloping stem and a frame the dead works of which have an ample flare. The stern has a sledge-like keel which enables the ship to develop good speed and to work at draughts varying from 1.35 to 2.2 m. At 1.66-m draught the vessel has the coefficient of displacement at full load of 0.84.

The hull and the superstructure are of all-welded metal construction. The cargo-hold section of the motorship has double sides and bottom.

The ship's hull is a combination of different systems of framing. Its double bottom, double sides, the fore peak, the engine-room section, as well as the after peak are constructed according to the transverse system of framing, but the deck above the cargo hold -- according to the longitudinal system of framing.

Smooth walls and the absence of partitions in the cargo hold simplify considerably the loading, the unloading, as well as the hold-cleansing operations.

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The engine-room, the superstructure, and the deckhouse are located at the stern of the motorship. The main-deck superstructure houses the crew's living and service quarters. Crew members occupy single and double radio-equipped cabins located on the second floor. This location provides them with good natural lighting, clean air, and living space which is sufficiently distant from any sources of noise.

The wheelhouse is on the superstructure's third floor. Its fore wall is tilted in order to eliminate the reflection of shore lights on the sight glass at night time. Crew members have praised the excellent visibility forward, astern, and sideways from the steering position.

The steering gear consists of two extra strong turning nozzles modelled on the nozzles in use on tankers. This dual control ensures the ship's good manoeuvrability.

Unfortunately, the turning nozzles of this type have certain major faults; on turns exceeding a 10° angle there is much vibration and noise produced by the screws. Moreover, the vessel's steadiness on course cannot be guaranteed if the designed loading capacity is exceeded and the hold is trimmed down by the head. The Central Planning and Design Office and the Lena Shipping Agency, together with the institutes, have mapped out a number of experiments in order to eliminate these faults of the steering gear.

The anchor gear consists of two bow anchors weighing 600 kg each. An electrically driven windlass is used to heave up and stow the anchors.

The motorship's one boat serves both as lifeboat and as all-purpose work boat. It can be lowered by one man in two to three minutes. An electrically operated winch is used for hoisting the boat.

The cargo hold is equipped with telescopic steel hatch covers which ride on bogies and are moved by an electrically operated winch. Time needed to open them: 11 to 12 minutes.

The motorship's main power plant consists of two engines, each developing 400 effective horsepower at 500 rev/min. The control of these engines is remote and automated; their work is controlled from the wheelhouse. This makes it possible to forego the standing watch in the engine-room. The experience gained in operating this vessel during its first navigational period has shown that the crew may consist of nine men.

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While ship stands at berth, its quarters are heated with the aid of an automated water-heating boiler KOAV-68. When on run, the heating is provided by a waste-heat muffler boiler installed on the exhaust pipe of the starboard main engine.

The exhaust pipes of the main and auxiliary engines, as well as the boiler's funnel, pass through two ventilating shafts and protrude above the wheelhouse. This has eliminated smoke interference, ensured good visibility astern from the wheelhouse, and increased the efficiency of the exhaust-ventilation unit in the engine-room. The experience in operating this prototype ship has shown that the use of ventilation shafts for leading the exhaust pipes through them has proved its value.

The ship's power unit with generates 220-volt A.C. consists of one 25-kilovolt diesel-generator and one 25-kilovolt generator driven by a shaft-transmission from the port-side main engine. On serial-production vessels the power of the diesel-generator will be increased to 50 kilovolt because of the contemplated installation of an electric galley range and an electrically heated boiler.

Besides the usual ship's systems, such as fire-fighting, pumping, sanitary, water-supply, etc., this ship has a special tank for collecting water from under the cargo ceiling, as well as a ballast system. The ballast compartments can be used to trim the ship by the stern to improve its speed and manoeuvrability when it sails empty, or to trim it by the head in case of necessity to examine or repair screw propellers on the run.

The motorship has modern, electrically-operated navigation equipment: echo-sounder, radar set, radio-telephone, radio-relay unit, impulse blinkers, searchlights.

The important special features of the new dry-cargo motorship are its single hold without any bulkheads and, nevertheless, a sufficiently strong hull. These features make it possible to load, or unload, a 1,000-ton cargo by one whole layer at a time.

Special static tests of the hull's strength have revealed the posibility of raising the load-carrying capacity of the vessel to 1,500 tons by means of reinforcing to some small extent some of the plates, thus increasing their stability.

Besides giving the vessel its required stability and making the stowage of cargo more convenient, the double bottom and sides assure the ship's unsinkability in case any one of its compartments becomes accidentally inundated. This, of course, assures the cargo's protection against water-damage.

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It has been confirmed by calculations that the use of these dry-cargo motorships of the new type will improve substantially the economic indices of shipping on the river Lena and its tributaries.

During its trials, conducted by a State Commission, the prototype motorship has shown good operational and sailing qualities. The Ministry of River Fleet has passed a resolution to approve serial production of vessels of this type, under class "O" rating, for the Lena Shipping Agency. The building of these vessels for other Siberian rivers is also being considered. The author of this article was: A. DOLGIY.

Rechnoy Transport
July 1966
pp 25-26
(Full text)

The Development of Crude-Oil Shipments in Western Siberia

One of the tasks set by the directives of the 23rd Congress of the CPSU for the five-year economic development plan of the USSR provides for "A powerful national-economic complex to be created on the territory of Western Siberia to utilize the recently discovered oil and gas deposits and the rich forest lands. The output of oil in Western Siberia must be raised to 20 - 25 million tons and that of gas to 16,000 - 26,000 million cubic metres".

The deposits of oil and gas are situated on the territory of the Tyumen' and Tomsk Oblast's, and there is every reason to expect that further commercial reserves will be discovered in the next few years in adjacent Rayons (districts) of the Omsk and Novosibirsk Oblast's.

The forecast reserves of oil on the territory of Western Siberian lowlands are estimated to measure many tens of billion of tons and of gas -- trillions of cubic metres. The overall area of the prospective oil and gas bearing lands in Western Siberia even at this stage may be expressed by the figure of 2,000,000 square kilometres.

Currently, in the Tyumen' and Tomsk Oblast's, a score or two of oil and gas deposits have been discovered on the territories of the Khanty-Mansiyskiy and Yamalo-Nenetskiy National Okrugs which extend far beyond the Polar-Circle boundaries, right up to the shores of the Kara Sea.

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The largest of them are situated within the middle-latitude reaches of the Ob' river, while all others are connected with its basin by means of a system of rivers and channels.

Good permeability of the productive beds, the multi-layer structure of deposits, the low cost-price of oil extracted according to the gushing method of exploitation of high-yield wells, and its excellent quality predetermine the urgency of the most rapid development of the oil and gas extracting and petrochemical industry in Western Siberia.

The relatively shallow depth of bedding of the oil and gas saturated levels which can be very well handled by the modern drilling techniques, the favourable geological conditions which facilitate drilling operations and preclude any serious complications, ensure the high-speed digging of the well and make it possible to utilize the capital investments more effectively by comparison with other regions of the Soviet Union.

The Western Siberian oil potential is so vast that, by 1980, it can bring the extraction of oil up to the volumes which we had in 1965 in respect of all oil-producing regions in our country put together. In the course of one fifteen-year period (1966-1980) alone it will be possible to extract in Western Siberia more than one third of the total quantity of oil obtained during the 100-year history of the oil industry in Russia.

In accordance with the directives of the 23rd Congress of the CPSU, a broad programme of works has been already evolved this year for the development of the oil-extracting industry in Western Siberia at an accelerated rate, from now on till 1970. On the strength of this programme, tasks have been set for stepping up the output of oil and for increasing the reserves in three industrial categories which will, in the nearest future, enable the Western-Siberian oil industry to take its rightful place amongst the leading oil-refineries in our country.

Many of our ministries and departments will be urgently required to devote a fair number of their efforts to the fulfillment of this great and responsible task.

Under severe natural conditions in the northern oil and gas regions, we are faced with the prospects of blazing through vast secular forests of the taiga belt and across innumberable rivers and swamps thousands of kilometres long oil and pipelines, railroads and highways, power transmission and communication lines; of building new towns and cities, plants, power stations, aerodromes, river ports and wharves; of carrying out large-scale dredging operations; and of creating a base for the construction industry and for whole industrial complexes.

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In the course of the five-year plan an industrial foundation will be laid for the development of the Siberian oil and gas extracting industry, the creation of which required large capital investment grants and augmented technical resources; in the first place, transport equipment and road-building machinery.

The development of northern oil and gas regions is inconceivable without reliable transport connections. Hence, over one thousand kilometres of motor roads and the Sotnik-Uray and Tyumen'-Surgut railway lines with a connection to the Trans-Siberian trunk line will have to be built. Permanent aerodromes, capable of receiving heavy aircraft, and mechanized river ports and wharves will be constructed in all oil-bearing regions.

All this raises sharply the role of river transport wihin the overall transport set-up serving the needs of the oil and gas producing regions, particularly during the initial years of their development.

The volume of cargo shipments by the Ob' and Irtysh Shipping Agencies will be increased substantially. The shipments carried by oiler vessels of the Ob' Shipping Agency by the end of the five-year plan are bound to grow more than three-fold in volume, and its dry-cargo shipments -- time and a half; those of the Irtysh Shipping Agency -- by 60% and 70% respectively. The most labour-consuming shipments of such cargoes as cement, reinforced-concrete prefabs, metal constructions, and various kinds of equipment must be increased 2 to 2½ times.

The execution of such voluminous shipments will necessitate a substantial replenishment of the shipping agencies' transport fleets by vessels of increased load-carrying capacity. The Irtysh navigational conditions permit the employment of barges of 3,000 - 3,200 tons load-carrying capacity, instead of 1,850 tons in use at present, for shipping crude oil and dry cargoes. This would also increase the productivity of the type "OT" pusher-motorships owned by the shipping agency. The allotment of 2,000-ton "Belomorskiy" (White-Sea) type cargo motorships is planned for transporting cargoes to the Ob'-Tazovsk gulf.

The fleet of tankers will be substantially replenished with vessels of greater load-carrying capacity.

The shipping agencies' requirements in general-service and auxiliary vessels must also be taken into consideration.

The available general-service vessels are low-powered and virtually antiquated steamers relieved from transport duties because of their low hauling performance. There is a complete lack of self-propelled repair ships and refuelling vessels; the organization of the fleet's shore maintenance services is quite unsatisfactory.

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In addition to the replenishment of shipping agencies' tonnage with modern transport vessels, the Ministry of River Fleet must, at the same time, expand its programme for the construction of general-service motorships and of other auxiliary vessels.

The 600-horsepower pusher-tug of the "Shlyuzovoy" (Lockage) type, which has proven its worth in actual practice, should be accepted as a standard general-service motorship. It is expedient to make provisions for the construction of at least ten repair ships and self-propelled bunker stations.

The replenishment of the Ob' and Irtysh basin's fleet demands the strengthening of shipping agencies' repair-yard facilities. With this purpose in mind, reconstruction is taking place of the repair yards in Tyumen', Tobol'sk, Omsk, Novosibirsk, as well as of the Samus'sk and Moryakovsk RED (Repair and Maintenance Depots). Specialized dockyards for the repair of oil-carrying vessels are under construction on the Irtysh and Ob' rivers.

In the course of the current five-year period, the navigational depths must be increased by means of intensified dredging on the Tura and Tobol -- by 140 cm, on the Irtysh below Omsk -- by 270 cm, on the Ob' through to Novosibirsk -- by 215 cm, and on many branch rivers.

Special attention has been paid to the development of port and wharf facilities. Much work has been already done on the reconstruction of the Omsk port and the construction of a port in Tyumen'; the mechanical installations of the Novosibirsk port have been enlarged; and the Surgut port has been completed in that oil-field area.

In connection with the linking-up of the Tyumen'-Surgut railway line with Tobol'sk, plans have been made for the construction, in 1967, of a port in that city designed to handle transfers of various kinds of freight from rail to river transport, and vice versa, to the total volume of up to 1,500,000 tons per navigational period. During the current five-year period, the construction of a large transshipment port in Tomsk will be completed; the mechanized cargo wharves in the port of Surgut, as well as the second-stage portions of the Omsk and Tyumen' ports will be put into operation.

The capacity of warehouses for indoor storage of cargoes in the Novosibirsk port is being enlarged.

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Upon the completion of the railway line Ivdel' - Ob', a large transshipment port will have to be built in Sergino.

In view of the industrial development in this region, the shipping of Tomsk oil to Novosibirsk was organized for the first time during the current navigational period. The rivers Tym, Vasyugan and Parabel', which flow through this area, have now become highly important because of the transport possibilities they offer, and their full navigational development is an extremely responsible task of the Ob' river-transport authorities.

The development of Tomsk oil shipping will necessitate the construction of mechanically equipped wharves at Kolpashevo, Aleksandrovskoye and Kargasok.

Other ministries will also participate in the great programme of building up the port and wharf facilities in the Ob'-Irtysh basin.

It is the duty of the "Gosplan" (The State Planning Committee) of the USSR to consider the proposals of the Ministry of River Fleet on the accelerated construction of shore installations in the oil-producing regions and on the strengthening of the material and technical basis of river transport in that area.

Huge gas deposits have been discovered in the Tazovsk-gulf and the Yamal-peninsula area which are partially covered by permafrost and where the climatic conditions are extremely unfavourable. The development of these areas and the construction of a gas pipeline in the West will necessitate the delivery of large quantities of equipment and building materials. Further difficulties will arise due to the short navigational period (60 days), the absence of roads, the lack of equipped unloading stations, the insufficiently charted rivers. Therefore, the creation of normal navigational conditions on the rivers Pur, Taz, Nadym, Sos'va must be accompanied by the solution of problems connected with the organization, at the expense of the clientele, of temporary wharves for unloading the arriving cargoes.

Major tasks have been assigned to the personnel of the designing organizations of the Ministry of River Fleet. As a result of the railway lines' Ivdel'-Ob', Tavda-Sotnik, Tyumen'-Surgut and of the oil pipeline's link-up with Omsk, the cargo traffic in the Ob'-Irtysh basin has changed quite noticeably.

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These circumstances should be taken into consideration right now, while the plans for the construction of the Tobol'sk and Surgut ports and of the wharves at Aleksandrovskoye, Kolpashevo and Kargasok are still in the process of elaboration.

The well organized work of the river transport has contributed greatly to the successful development of oil prduction during the final years of the Seven-Year Plan. The development of shipbuilding in Tyumen' and the transfer of vessels from central basins via the Northern Sea Route have solved the problem of the fleet's replenishment. The Shipping Agencies of the Ob'-Irtysh basin have received about 400 different vessels.

As we have remarked upon earlier, much reconstruction and construction work has been completed in ports.

The organizations headed by the Ministries of Gas and Oil Extracting Industry and of Geology have established in Tyumen' large bases which are capable of receiving goods from the railway all year round through the river wharves in Omsk, Novosibirsk and Tyumen' and of shipping them off by water.

The Novosibirsk Branch of the "Giprorechtrans" (The State Institute for the Planning of River Transport) had prepared the plans which were used for the construction in the oil-field areas of temporary wharves for the unloading of ships. About fifty of these wharves are in operation during the current navigational period. The construction of permanent wharves which will form a component part of the future cargo section of the port has been started in Surgut.

The Irtysh and Ob' Shipping Agencies, guided by the plan of this year's operational work, have organized special cargo lines by assigning to them vessels capable of handling the considerably increased first-priority shipments of goods to the oil-field areas.

The distribution of floating crane machinery has been revised with the view of reinforcing the mechanized equipment of unloading station. Taking into account the mechanized equipment owned by the clientele, more than 40 floating cranes of various types are now accumulated in the oil-field areas.

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The Fleet's movement-control system has been changed. The shipping agencies of the Irtysh and Tyumen' lines have set up special controller's offices in charge of the fleet operations and of the movement of cargo motorships; the Ob' Shipping Agency -- an oil-shipping department. A specilized exploitation authority has been set up in Omsk for the direction of the oiler-fleet operations and for the provision of all the required supplies.

All this, together with other organizational measures carried out by the collectives of shipping agencies, was aimed at creating conditions necessary for a successful fulfillment of shipping assignments and of socialist pledges. Unfortunately, the late opening of this year's navigational period on the lower reaches of the Ob' river and the high level of spring waters have produced additional difficulties in the organization of dry-cargo and crude-oil shipments.

The inundation of bases belonging to the Tyumen' Oil and Gas Construction organizations in Novosibirsk as well as the wharves for unloading dry-cargoes and for filling vessels with crude oil in Nizhne-Vartovskoye, Megion, Surgut and Nefteyugansk has completely upset all traffic schedules and, in June and July, vessels were often arriving simultaneously at their loading and unloading stations.

Moreover, it should be noted that, despite these conditions, no adequate measures for speeding up the processing of vessels and intensifying the shipments were undertaken neither by the enterprises of the Ministry of Gas and Oil Extracting Industry, nor by the Irtysh and Ob' Shipping Agencies.

As a result, during the 2nd quarter, vessels were allowed to stand idle for a long time, and the plan for deliveries of cargoes to their destination points had to remain unfulfilled.

The wharf at which vessels take on crude oil in Megion, where the clearance of spring-flooding after effects is proceeding very slowly, is still working quite unsatisfactorily.

The lack of a second wharf for pumping crude oil out of barges at the Omsk petroleum processing plant constitutes a serious obstacle to the intensification of its shipments.

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Although the USSR Ministry of Petroleum-Processing and Petrochemical Industry has agreed, as early as in 1965, with the urgent necessity of constructing such a wharf, nevertheless, to date, this work has not been started.

The task of the Irtysh and Ob' Shipping Agencies' personnel is to make use of the remaining portion of the navigational period in order to seek, in close co-operation with the building and oil-field workers, as well as with prospectors, to overcome the delays and to achieve a complete fulfillment of the shipping plan and of their socialist pledges. The author of this article was: B. MOREV, USSR Ministry of Oil-Extracting Industry and V. IVANENKO, RSFSR Ministry of River Fleet.

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(Full text)

The Way to Develop the Fleet of the Lena Shipping Agency

The basic operative stocks of the Lena Shipping Agency's fleet have increased during the past seven-year period by 67.8%. The quality of the transport fleet's stocks has changed: dumb wooden vessels have been replaced completely by metal ones; individually built steamers have been taken out of service; the steamers of 732 series have been adapted to liquid fuel and, in 1967, they will fully be equipped with complex automatic systems.

In the course of seven years, from 1958 to 1965, the fleet of the Lena Shipping Agency was being intensively replenished by large dumb lighters and barges, dry-cargo and tank motorships. The tanker fleet tonnage has multiplied during the seven-year period 4.7 times, while the shipments of petroleum products in tank vessels have grown from 39 to 62% of their total freight turnover.

During the same period the tonnage of dry-cargo motorships has multiplied 19.6 times, and the freight turnover, accomplished by this group of vessels in 1965, amounted to 45.5% of the total dry-cargo transportations. The decisive development of domestic shipbuilding dates from the years 1960-1965. By that time the shipbuilding yards in Kachuga, Zhigalovo and Osetrovo had become, both technically and organizationally, firmly established. Above all, a wide perspective had opened up for keeping these shipbuilding enterprises fully occupied even in the more distant future. This made a particularly beneficial contribution to the rate of development of the yard at Zhigalovo which at the time of its transfer from the "Lenzolotoflot" (The Lena Gold-fields Fleet) was at the brink of being closed down.

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At the present time the share of diesel fleet has grown to 88.2% of the shipping agency's total tonnage, and the average cargo carrying capacity of motorships has multiplied 1.9 times.

The boost given to the shipping agency's material and technical basis has made a postive contribution to the fulfillment of the seven-year plan's principal tasks. The volume of shipments during that period has become 2.1 times larger, and the freight turnover -- 2.24 times. The combining of trades, the progressive methods of semi-sectional train navigation, the shipping of general packed cargo in containers, on stands, and in packets have been widely developed. This made it posssible to raise the productivity of shipping labour, during the Seven-Year period, by 97.3% and to lower the self-costs by 36.5%. The shipping operations have become 1.5 times more profitable.

The decisive factor in the achievement of positive results was the technical rearmament of the fleet. Early in the sixties, the the Shipping Agency had to face the problem: what kind of vessels should be built? Should one continue, as before, to build towing and dumb vessels, or is it better to choose another direction, i.e., to provide the fleet with additional cargo motorships? The "TSNIIEVT" (The Central Scientific Research Institute of Economics and Exploitation of Water Transport) at the time recommended for the Lena basin new types of tankers and dry-cargo motorships of 600 and 250 tons freight carrying capacity (TSNIIEVT issue XVII 1959). These recommendations were incorporated into the projects 765 and 866. Having obtained these ships, the shipping agency, however, became convinced that they cannot be regarded as the principal type of vessels. The 1.8 - 1.9 - metre draught was not satisfactory. During the mean-level period, the utilization coefficient of the load carrying capacity did not exceed 0.5 - 0-6.

How many of these vessels are needed for shipping one million tons of general cargoes?

The available list did not offer any other choices. This is the reason why the agency was forced to use at first the dry-cargo motorship of 600 tons load carrying capacity, with the 1.5-metre draught, designed by the Dnepr Shipping Agency. This design, improved quite substantially, is still in use to-day. Nevertheless, energetic measures were taken to substantiate the requirement in shallow-draught motorships of not less than 1,000 tons load carrying capacity.

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As early as 1958, the management of the Shipping Agency made a proposal to review the types of vessels on the available list, giving first priority to those suitable for the free rivers of our country's North-East. About four years have passed until the matter was finally decided. The possibility of using large-tonnage ships on the river Lena had to be not only supported by figures but proven in actual practice. In 1962, the collective of the Alekseyevo "REB" (Repair and Maintenance Depot) converted a dumb lighter into the dry-cargo motorship "Lena" of 2,500 tons load carrying capacity, the putting into service of which has inaugurated a "through" traffic route from the part of Osetrovo to Nizhne-Yansk.

Unfortunately, this fact did not arouse the interest of the Technical Directorate of the "MRF" (Ministry of River Fleet) or of the scientific research institutes. Ever since 1962, the Shipping Agency has been trying to obtain permission to design and build shallow-draught dry-cargo and tanker motorships of 2,000 - 2,500 tons load carrying capacity basing its proposals on the concrete results of the actual operation of large-tonnage vessels.

In 1965, the motorship "Lena" has completed 33.6 millions ton-kilometres. Its maintenace costs amounted to 83,700 roubles. The operational self-cost proved to be the very lowest: 2.49 roubles per 1,000 physical ton-kilometres. This, in contrast to vessels recommended by the "TSNIIVET", the operational self-cost of which amouts to 3.35 (project 476T) and up to 4.68 roubles (project 932). The indices for the productivity of labour are in much the same relation.

At present, the most economical vessels among those belonging to our Shipping Agency are the motorship "Lena", the 1,000-ton tankers, and the dry-cargo motorships (projects 1754, 414-N, 272, 2036). But time goes on...

The navigational conditions have been improved considerably during the Seven-Year Plan period. For example, this year the depth of 1.8 metres is guaranteed throughout the limited-passability sector Osetrovo - Vitim; and, by 1970, the waterway engineers are determined to clear the route to the depth of 2.1 metres.

Consequently, it is up to us to be ready for it and to win over the appropriate scientific and construction organizations.

And how are these organizations helping the Lena Shipping Agency to resolve the sore matter of its fleet?

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In January of this year, the Novosibirsk Branch of the "Giprorechtrans" (The State Institute for the Planning of River Transport) made an announcement to the effect that the agency's request for designing shallow-draught motorships of 2,000 tons load carrying capacity with 2.4 metre draught is unfounded (?). Vessels of the project 781 of 2,000-ton capacity and 3.3-metre draught are available, so is there really a need for new motorships to serve the route from Osetrovo to Indigirka?

The second institute -- "LIVT" (The Leningrad Institute of Water Transport) -- replied in the form of a verbose conclusion the gist of which comes to the allegation that the type of dry-cargo vessels, proposed by the Shipping Agency, would be less effective than the existing motorship of Czech construction (project 2188) with 2.8-metre draught, or the above-mentioned project 781 motorship. At the same time, "LIVT" has expressed a positive opinion about the proposed tanker project.

In April of this year, guided by the research conducted by "Giprorechtrans", "TSTKB" (The Central Technical-Construction Bureau), and by "LIVT", as well as by its own studies, "TSNIIEVT" arrived at the conclusion that it would be inexpedient to construct special dry-cargo and tanker vessels for the river Lena to operate as far as the mouth of the river Yana and, possibly, up to Indigirka. The "TSNIIEVT"'s, recommendations advocate the use of the project 2188 vessels (which have been withheld for the last 3 to 4 years from the Shipping Agency), of self-propelled lighters of project 932 type, of 500-ton tankers of the Lena Shipping Agency's project 01, as well as of 1,000-ton river tankers.

It is, however, difficult to reject proposals prompted by life itself. In substantiating its choice of the most profitable vessel for the transportation of cargoes to Yana, "TSNIIEVT" has not considered the most obvious type of 2,000-ton shallow-draught tankers. Their construction costs have been overestimated. The project 1754 class "O" tanker, proposed by "TSNIIEVT" for the route Osetrovo - Tiksi, has as yet not been built, and the Shipping Agency has not been given permission to complete work on this project. The project 1754 river tankers cannot be put into operation on this route.

Making use of some of the initial data supplied by "TSNIIEVT", the Shipping Agency has produced an estimate of technical and economic indices covering the shipping of petroleum products from Lena to Yana. The comparison of the above-mentioned expenditures for the delivery of petroleum products from Osetrovo to Nizhne-Yansk shows clearly that the tanker of 2,000 tons load carrying capacity, proposed by the Shipping Agency, will have considerable advantages by comparison with other types of tankers.

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The time is ripe for making a concrete decision on the choice of new-type vessels and for cleaning up the existing network of vessel types, leaving enough free space for more economical ships suitable for individual basins. The currently available variety of the types of vessels does not meet the needs of the Lena Shipping Agency alone; it is equally unsuitable for other basins with limited depths.

In May of this year, the Technical Directorate made a good decision on the preparation of proposals of the Board concerning the reinforcement of the Lena Shipping Agency's fleet to enable it to cope with the ever increasing shipments and to raise the rate of deliveries of cargoes into the North-East regions of Siberia via the Osetrovo port.

Guided by the growth of shipments in 1970, as compared with 1965, by 42%, or by 82.5% in respect of liquid cargoes, the Lena Shipping Agency has submitted to the PEU (The planning and Economy Directorate) a draft ship-building programme which embraced also the requisition of the Kolyma-Indigirka Shipping Agency.

The trend is in favour of building large-tonnage, shallow-draught cargo fleet. This protects river-transport workers against the whims of nature and enables them to transport cargoes under any hydrological conditions. It has been figured out that it costs 68% more to ship goods in dumb barges than in cargo vessels. The replacement of steamers by cargo motorships has resulted in three times higher productivity of labour.

Thus, which are the new types of vessels needed by the Lena Shipping Agency? First of all, it is imperative to improve, without disturbing the production rhythm or losing the advantages of large-scale serial construction, the already developed types of vessels, i.e., the project 1754, 1,000-ton capacity tankers and the project R-25, 1,000-ton dry-cargo motorships.

The qualitative improvement of tankers can be achieved by raising their load carrying capacity to 1,500 tons and giving them a higher navigational rating, while the improved dry-cargo motorships would have to have the capacity of their cargo holds increased by building up their coamings. These measures can be carried out in 1967.

Secondly, there is a need for a new design of shallow-draught tankers and dry-cargo motorships of 2,000-2,500 tons load carrying capacity to serve on the route Osetrovo--Nizhne-Yansk. This would call for a digression from the established correlations of main specifications of river vessels and for achieving draught reduction by increasing their relative breadth.

The experience gained in the operation of "SP-800" motorships shows that broad vessels are affected by shallow waters considerably less than the ordinary ones; not to mention the more effective utilization of their load carrying capacity.

The Ministry of River Fleet is building 2,000-ton motorships with a 2.8-3.3-metre draught, but Lena needs the same tonnage motorships with a 2.2-2.4- metre draught.

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Table 1

Type of vessel	HP	Load capacity, tons	Project No.	Class	Draught	Prototype's year	Enterprise
Tanker	800	1500	1754B	"O"	2.25	1967	Shipyard at Kachuga
Dry-cargo motorship	800	1500	R-25A	"O"	2.25	1968	Shipyard at Zhigalovo
Towing motorship	450	—	911A	"R"	0.95	1966	"REB" at Alekseyevo
Towing motorship	600	—	R-33A	"R"	1.30	1968	As above
Tanker	1320	2000	—	"M"	2.40	1969	Shipyard at Osetrovo
Dry-cargo motorship	1320	2000	—	"M"	2.40	1970	As above

Table 2

Project No.	Load capacity, t	Class	Draught, metres	Speed, km/hr	Production, mlns phys. t/km	Self-cost, 1000 phys. t/km	Capital investments per 100 phys. t/km, roubles
1. EXISTING TANKERS							
01	500	"M"	2.3	14.5—17.4	6.6	4.88	17.6
866	600	"O"	1.9	15.8—18.0	7.8	5.51	—
414-N	600	"O"	1.5	15.2—17.5	11.2	2.88	13.2
1754	1000	"R"	1.7	17.5—20.2	18.8	2.91	16.5
576T	2800	"O"	3.3	17.5—19.1	27.0	3.35	—
TANKER PROJECTS PLANNED FOR 1966—1970							
1754B	1500	"O"	2.25	18—20	25.5	2.42	13.7
TM-2000	2000	"M"	2.4	19—21	32	2.80	15.6
2. EXISTING DRY-CARGO MOTORSHIPS							
765	600	"O"	1.9	17—20	10.4	3.67	—
414	600	"O"	1.5	14.2—17	9.9	4.20	—
2725	800	"R"	1.45	19—20.5	15.4	2.92	13.0
GT-900	900	"M"	2.3	15.8—18	11.1	4.68	20.9
2036	1000	"R"	1.7	19—20.6	21	2.77	15.4
573A	1000	"O"	2.3	20.9—22.6	22.6	3.04	—
"Lena"	2500	"M"	2.8	15.5—20	33.6	2.49	16.3
MOTORSHIPS UNDER CONSTRUCTION AND PLANNED FOR 1966-1970							
R-40	800	"O"	1.5	19—20.5	15.4	2.93	14.5
R-25	1000	"O"	1.7	18—20.6	21	2.80	16.2
R-25A	1500	"O"	2.25	18—20.6	26.6	2.22	13.2
STM-2000	2000	"M"	2.4	19—21.0	31	2.80	17.7

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In the third place, the growth of the large-tonnage fleet, the practice of winter loading of ships in the port of Osetrovo and the severe climatic conditions have raised the problem of replacing the general-service fleet by more powerful and durable vessels. This conerns the replacement of type "BT-150" and "BTT-300" motorships by 450-600 - horsepower motorships.

The Shipping Agency will build, in 1966, 450-horsepower tugs in accordance with the project 911A. Screw tugs of 600 horsepower are needed for the harbour of Osetrovo, for the Krasnoarmeysk "SRZ" (Ship-Repair Yard), the Alekseyevo "REB" (Repair and Maintenance Depot), for the tying up and, especially, moving vessels out of back-waters after the spring break-up. The project R-33 tugs are best suited for these purposes and for the subsequent replacement of steamers. The Shipping Agency insists on the construction of the prototype motorship.

The production of new-type vessels by the enterprises of the Lena Shipping Agency may be accomplished by the times shown in table 1.

The Shipping Agency is in possession of all the required production facilities for the construction of the new economical fleet. The production capacity will be raised substantially as soon as the new shops at the Osetrovo Shipyard will be put into operation. This, of course, evokes the question: is it necessary to wait until ships, which are in good technical condition but not economical to operate, become physically worn out, or is it advisable to replace them? Guided by the considerations of economy, the Shipping Agency considers it expedient to refrain from major repairs on 500-ton tankers of project 01 and to replace them with 2,000-ton tankers. This would be very promising to the reduction of self-costs and to the increase in the productivity of labour. The same results may be achieved by the replacement of project 732 steamers with diesel tugs (project R-33). The author of this article was: I. DMITRIYEV, Chief Engineer of the Lena Shipping Agency.

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Everything in Our Power Must be Done to Fulfil the Assignments for the First Year of the Five-Year Plan

The directives of the 23rd Congress of the CPSU for the five-year economic development plan of the USSR for 1966-1970 provide for the river fleet to develop its ability to handle in full all freight available in the vicinity of inland waterways. The river-transport workers of the Ob'-Irtysh basin have the most responsible tasks before them. The freight turnover of the Ob' Shipping Agency will be increased by 23% this year, and the oil shipments alone will be 3.2 times greater. The freight turnover of the Irtysh Shipping Agency will be increased by 11%. It is the duty of these Shipping Agencies to transport about 1.5 million tons of crude oil to Omsk and Novosibirsk from the new deposits in the Tyumen' Oblast' and deliver almost 700,000 tons more than last year of all types of freight to the oil-field regions.

The most important task of the river fleet in the third quarter is the organization of freight transportation in the North.

In the Ob'-Irtysh basin it is imperative to assure the delivery of all materials to their destination points in the Ob' and Taz gulfs for the enterprises of geological exploration and of gas industry, to speed up the transportation of freight for the oil and gas industry in the Tyumen' and Tomsk Regions.

The Yenisey river-transport personnel have much work in store for them. Their mission is to take complete care of the transport requirements of the metallurgical combine at Noril'sk.

The Ministry has made the decision to allot an additional fleet of vessels to the Yenisey Shipping Agency. Ships will be dispatched in a loaded condition via the Northern Sea Route. The organization of the pilotage of these vessels is a serious and responsible task of the "Glavflot" (Headoffice of Shipping and Movements of the Fleet) and of the Dispatch Office of Special Sea Piloting.

In the Lena basin much freight will have to be delivered to Indigirka, Yana and Tiksi. The duty of the Lena river-transport workers is to make certain that all cargoes are shipped there on time. For the first time during this navigational season dry cargoes will be shipped on dumb lighters by direct routes to Indigirka as far as Chekurdakh. From the port at Osetrovo ships will travel a difficult route on the Lena river, on the Laptev and on the East-Siberian Seas. Pending the arrival of sea-going vessels at the port Kray Lesov, the Kolyma-Indigirka Shipping Agency must assemble the required number of lighters for taking aboard their cargoes and delivering them to their destination points.

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The Shipment of Tyumen' oil continues to be a matter of the utmost importance to the river-transport workers. It is the responsibility of Irtysh Shipping Agency's personnel to liquidate the backlog which has been allowed to accumulate there. Unfortunately, the employment of oil-tanker vessels in the Ob'-Irtysh basin leaves much to be desired. First of all, the wasteful inactivity of vessels while waiting to be unloaded must be drastically curtailed. A well founded regularization of the joint operation of the oil-tanker tonnage by the Irtysh and Ob' Shipping Agencies must be accepted as the basis for all their activities. Moreover, permanent control should be established over the employment of the fleet and the regulation of its movements. The author of this article was: S. KUCHKIN, Minister of River Fleet.

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2 August 1966
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(Extracts)

Cape Chelyuskin was Left Behind

This year the navigation conditions in the north-eastern part of the Kara sea and in the Vil'nitskiy Straits turned out to be very difficult. Landfast ice covers dozens and dozens of kilometres. There are long ridges of hummocks in some places. The sea is often covered with a blanket of thick fog. All this stood in the way of the first convoy which left Dikson on the 30th of July and took the eastward course in order to reach the Laptev Sea via the Vil'kitskiy Straits.

The fight against the elements was taken up by the crews of the new icebreaker "Kiev", of the diesel-electric motorships "Lena", "Tsimlyanskges" and of the motorship "Stanislavskiy". Polar airmen came to the assitance of seamen. They conducted an uninterrupted air reconnaissance.

The ice-breaker "Kiev", commanded by Captain V. GOLOKHVASTOV, used its full power to crush the ice barriers in order to clear a channel through the landfast ice. Many a time "Kiev" and "Lena" had to take all other vessels in tow and to lead them forward. Yesterday our correspondent was informed by the Headoffice of Navigation that the first convoy sailed on the 7th of August past cape Chelyuskin, the northermost point of Eurasia. A few more dozens of miles were left to be negotiated before the area of open pack-ice is reached.

On the 7th of August, a second convoy guided by the ice-breaker "Krasin" said good-by to Dikson.

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Among the Seamen of the Arctic

The state flag of the USSR was hoisted at the end of June in Rostock on the motorship "Severodvinsk". This new ship belongs to the type of vessels called "Povenets", but its rigging is more up-to-date.

The "Severodvinsk" completed its first voyage from Rostock to Leningrad where it took on a cargo for the Norwegian port Strand.

With great enthusiasm the entire crew began to learn all about the new equipment. Under the direction of machinists, comrades SEREBRYAKOV, BOGDANOV and POZHENSKIY, all sailors studied in their spare time the layout diagrams and the working principles of individual units and practiced the stripping of mechanisms.

After a short stay in the base port of Murmansk, the motorship "Severodvinsk" took the course towards the Arctic. The members of its crew prepared themselves thoroughly for navigation in polar waters. All seamen promised to do all in their power and skill to fulfil successfully their responsible mission.

The Best in the Region

The participants in the recent seminar of secretaries of local Party organizations of the Murmansk enterprises were now the guests of the Murmansk commercial sea port decorated with the order of the "Labour Red Banner". They were getting acquainted with the practical work of the Party Committee and with its activists, as well as with the activities of Party groups on the vessels of the port-service fleet.

Having attended with great interest several lessons, the participants in the seminar visited the port's Room of Political Enlightenment. It is in the care of the chief of the capital-construction department, Izabella Yanovna BUSHTRUK, who considers this to be her social obligation. She expertly selects the literature for lecturers, agitators and propagandists, and helps many of these with her advice. The Room is colourfully arranged. A wide use is made of visual **aids technical means of propaganda.** documentary and popular-science illustrations, colour-slides. The Party Oblast' Committee, having inspected the Rooms of Political Englightment maintained as a social duty, pronounced the Room of the Murmansk port to be the best of all.

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Wharves are Under Construction

With every passing year the wharves in the Murmansk commercial port are getting wider and acquire new equipment. The reconstruction of the 16th wharf in the second sector was completed just recently. Prior to the opening of the Arctic navigational season, two gantry-cranes with extra long booms were installed there. Coal-carrying vessels can now be processed much faster.

The most significant undertaking was the inauguration of the transformer sub-station. The absolute necessity that the assembly and the setting-up of the equipment had to be done without interrupting the functioning of mechanisms presented the main difficulty. The electricians, comrades NIKANOROV, SHARPAOV and others completed their work seven days ahead of schedule.

The construction of a new wharf is now in full swing; it is scheduled to be ready for operation towards the end of this year. The personnel of the "Lenmorniiproyekt" (The Leningrad Scientific Research Institute of Sea Projects) are engaged in experimental work on the pneumatic transportation of the apatite concentrates.

Without Entering the Dock

Most unusual work had to be done recently by a team of fitters of the floating workshop of the Arctic and Ice-Breaker Fleet Administration. Repairs on the screw propeller are normally done in a dock. But the limited time allowed for the diesel-electric motorship "Rionges" to stay in port and its scheduled important voyage to the Arctic made it necessary to do the difficult job while the ship was afloat. A new blade had to be made in a very short time and all the other blades had to be overhauled. The work was done in three shifts. Under the direction of master-mechanics, comrades POSPELOV and NEKIPELOV, the fitters, comrades KUZNETSOV, VARNIKOV, OVCHINNIKOV, PEREBEYNOS and others, aided by the ship's sailors, took off the blades, unscrewed the old stud bolts, screwed-in new ones, and re-assembled the propeller.

Now the diesel-electric motorship "Rionges" is ready for the voyage and is loading the cargoes for the Arctic.

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With an "Experimental" Catch

The commercial refrigerator ship **"Zelnoborsk"** has returned to its home wharf from a far-away voyage to the George's Banks. Its crew has tested a new fishing device -- the forty-metre trawl net. The experiment turned out to be successful. Having adopted and used the unaccustomed fishing implement with good results, the fishermen mastered its use and immediately exploited their newly acquired skills. Their "experimental" catch contained over 2,700 tons of hake, haddock, burbot and herring. Their quota, assigned for that voyage, was greatly exceeded. The excess profit for the second quarter amounted to 966,000 roubles.

In the course of fishing operations the crews of a large number of trawlers requested assistance from their "lucky" neighbours. The captain-director of "Zelenoborsk", A. CHISTYAKOV, was more than willing to advise his comrades and to help them out with fishing equipment.

The next voyage of the fisherman on the polar ship "Zelnoborsk" will take them into the Tropics, to new fishing grounds near the shores of Uruguay. The author of this article was: L. KRIVENKO, L. LPACHEVA, and R. SALYAYEV.

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9 August 1966
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(Full text)

On the Vaygach Island

The motorship SB-103 has left Amderma and is on the way to the Yugorskiy Shar straits. We bid barewell to the Kara Sea and speed forward to meet the Barents sea... The first vessels of the special sea-faring expedition of the Ministry of River Fleet are standing in the Varnek Bay on the Vaygach Island. At last we meet. I proceed on board the OTA-897. Captain A. MEL'NIKOV introduces me to the detachment commander A. YELUFER'YEV. Three diesel-electric dredgers, two bucket dredgers, three suction dredgers and the motorship "Belomorskiy" arrived here recently from Arkhangel'sk. In their wake came the main convoy of the expedition with its **permanent** director, F. NAYANOV, in charge. Their future course - to the rivers of Siberia.

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During their stay on the Vaygach Island, the river-transport people visited local hunters, reindeer breeders and fishermen of the Nenetsk collective farm "Druzhba Narodov" (Peoples' Friendship). As soon as the guests found out that their hosts need help to repair the generator which supplies power to the settlement, they formed two teams of electricians. Repairs were completed successfully. While they were about it, the guests also replaced the old electric wiring in the store and at the medical post. The foreman of the Nenetsk collective farm members, V. PAVLOVSKIY, warmly thanked the river-transport workers on behalf of his comrades.

Our motorship SB-103 continues its cruise in the waters of the Barents Sea. Next stop -- the polar station on cape Belyy Nos. In the harbour -- the motorships "turinsk". With the aid of a small launch, our sailors put ashore on a scow provisions and other freight. Having provided the required services to seven stations of the Amderma radio and meteorology centre, the vessel steered off on the return course. The author of this article was: V. KNIPPER.

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30 August 1966
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(Full text)

Above the Centre of a Subterranean Ocean

The borders of this ocean have not as yet been accurately established. Hidden in the bowels of the earth, in the great calm and eternal silence, at the depth of two kilometres, it overflows an immeasurable space beneath the Western Siberian expanses. And above that ocean are the majectic rivers Ob' and Irtysh, thousands of lakes and streams, and the wilderness of the taiga. And yet, even now it can be said that the geographic centre of the oil ocean is right beneath the point of confluence of the Irtysh and Ob', where the taiga towns and settlements Surgut, Alöchka, Belyy Yar, Pimskaya, Nefteyugansk, Nizhne-Vartovskiy, etc., stand on the yellow sandy slopes.

The most important among them is Surgut. All roads lead to it, all man-power and equipment are concentrated here for the exploration and extraction of crude oil. There are many indications that in the near future the names of these localities will be pronounced with honour and respect. By the end of the current Five-Year Plan period the total volume of oil extracted in Western Siberia will be equal to that produced at present at the renowned oil-fields of Azerbaijan. And this means that in five to six years the production of oil will fully cover the needs of Siberia and that a substantial quantity of it will be shipped to the European part of our country. One can bravely say that we have acquired a "third Baku", and that the quantities and productivity of oil derricks will be infinitely increased in the remotest depths of the taiga.

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Last year alone seven new oil and four gas deposits were discovered. The explored reserves of crude oil have been doubled...

Just as in any development of a new industrial region, the extraction of West-Siberian oil has brought to the fore a number of truly enormous problems. Under the most difficult conditions, when the snow-storms fell trees in winter and when the intense heat seems to melt the currents of air in summer, it will be necessary to lay oil and gas pipelines, to build ports, wharves, railway trunk lines, to erect administrative, housing, club, hospital and many other structures.

The main problem so far is transport. On it at present depends to a large extent the subjugation of the Surgut taiga. The funds have been appropriated, the blueprints are ready, but the actual construction of railways, motor highways, river wharves, etc., is not a quick job. Meanwhile, oil is flowing faster and faster, all lines must function more vigorously, and the loss of time might turn out to be a loss of millions of roubles.

...The deputy harbour-master in the port of Surgut, Yu. MELIKHOV, was showing us the list of undertakings signed by the representatives of four ministries -- of Gas Industry, of Oil-Extracting Industry, of Geology and of River Fleet.

"Here, have a look!" said he, -- "these ministries have accepted the responsibility for putting into operation a number of wharves on the Ob' river. But, unfortunately, as far as the first three ministries are concerned, all their assurances simply remain on paper..."

This lack of responsibility hits the affairs at the port of Surgut very hard. Clearly, the specific nature of the operations in a port and at its wharves calls for constant contact with the clients' wharves. Poor conditions of wharves, or their complete absence, shortage of loading and unloading equipment cause prolonged stand-stills of vessels.

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...We were sailing on the Ob' river to Belyy Yar. The master of a section of the Surgut port. A. VASIL'YEV, was with us. He told us where it was planned to build wharves as he pointed to the banks covered with tall grass which was firmly rooted in the sandy soil.

"Wharves are to be built here...and here. But when will it happen?"

Belyy Yar. Pipes, beams, sheet iron are being unloaded. The floating crane works only when a truck comes to be loaded. There is no wharf, no shore equipment of any kind. Thus, the operations are limited to the "direct method": crane -- truck. This system makes it impossible to avoid stand-stills, and these are regarded here as a necessary evil...

As a result of the disorderly state of affairs in the construction of wharves, a colossal burden is placed on the shoulders of the Surgut port which, incidentally, are still fairly weak.

We are saying: "the port of Surgut". But, on the whole, this is still, to some extent, a very relative concept. The port in its conventional sense, as we know it, does not as yet exist. There are several administrative huts standing on a steep sandy slope. There are a few cranes which throw the freight direct unto the shore. The mechanization park and the equipment are still at the stage of complementation.

The port of Surgut is young. It is in its second year of operation. But even this short period of time the port has managed to increase its tempo. Last year's assignment was overfulfilled. The plan for this navigational season is almost double in scope. But the initial months have already shown that the work is proceeding at an excellent rate, and everybody is convinced that port personnel will be able to deal with the new plan just as successfully.

The work of construction should be given a boost and the whole project needs to be put on a firm basis, but everything somehow rests on the "Giprorechtrans" (State Institute for the Design and Planning of River Transport). We are still waiting for the technical documentation because the planners are behind in their work.

The port is in dire need of repair workshops and of other technical facilities. The building of a REB (Repair and Maintenance Depot) is now on the agenda.

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"Without it, we are just like without hands", -- say our dockers. "We have more and more vessels, and the problem of repairs is now a matter of first priority.

The plan provides for the construction of a mooring wall as first priority and of auxiliary installations, etc., as second priority. But life suggests **correction** to these provisions. It is obvious that the constructions of the mooring wall and of auxiliary installations should be conducted concurrently, as one undertaking, because the second-priority is at present, no matter how paradoxically it may seem more important than the first priority. It is most urgent now to think about shipping building materials and sheet piling to Chernyy Mys. The navigational season on the lower Ob' does not last too long, and if the river freezes over, it would become necessary to wait till next year regardless of whether the port receives the blueprints or not.

There was a time when Surgut was of very little importance. Just a village of wooden huts inhabited by trappers and hunters. These days, however, Surgut is having a revival. Its dusty streets, so dream-like and quiet in the past, are awakened by rumbling "MAZ" and "Ural" trucks and agile cross-country vehicles.

The population is constantly growing. The office of the port administration is often visited by new arrivals seeking employment. Among them are skippers, machinists, crane operators, etc. They come from various parts of the country, and many of them settle down in Surgut and become its permanent inhabitants.

The town is growing, too. There is a shortage of housing. All new arrivals -- labourers, drillers, teachers, artists, doctors... -- all have the same problem: living quarters. The town needs houses, but not houses alone. It needs also motion-picture theatres, clubs, shops, hospitals, schools, kindergartens... Some building has been started, but its tempo is rather slow. One must see the admiring looks cast at the first five-storey apartment building standing on the high banks of the Ob' river! But beside it still stand rows upon rows of tents and wooden huts. Streets are not paved and their names are written in chalk of the walls of log houses.

Nevertheless, river-transport workers, oilmen, builders, etc., come to Surgut by boat, and the land which lies above the centre of a subterranean ocean is now full of sound, movement, and hard, courageous, determined labour. After all, the ocean of crude oil can be subjugated by strong men only. The author of this article was: M. SAVEL'YEV.

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11 August 1966
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(Slightly abridged)

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"Vityaz'" on the Kuril Islands

The scientific-research ship "Vityaz'" has been ploughing the expanses of the north-western part of the Pacific Ocean for a whole month. The principal working area of this expedition is the Kuril -- Kamchatka deepsea depression which, by the way, was explored for the first time about fifteen years ago and recorded on the map by expeditons aboard the very same "Vityaz'".

The expedition's plan of scientific activities is being successfully implemented; new data have been obtained on the distribution of the primary biological production and of the plankton throughout all the strata of ocean water down to the eight-kilometre depths.

Sovetskaya Sibir'
11 August 1966
page 1
(Full text).

Petrochemical Shipments. Why are they Lying Idle?

During the three-month navigational period of the first year of the current Five-Year Plan, the Omsk port workers have dispatched about two hundred and fifty thousand tons of various kinds of freight for the petrochemical industry. Bricks, pipes, drilling equipment, house prefabs, structural steel, automobiles, foodstuffs are in a never ending stream. Every day two hundred and more freight cars arrive at the wharves. Dockers know how to unload them quickly. The following figures can serve as an example. In June of last year about two thousand freight cars with various kinds of goods were processed in the Lenin section of the port. Now it handles three thousand five hundred. In July 1965 a little over two thousand freight cars were taken care of, but now -- over four thousand. Omsk dockers used to spend over fourteen hours unloading one car; nowadays they can do it in five to six hours.

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The port at Omsk is working today faster and better. And yet, one cannot declare that everything is going well as far as the movement of petrochemical shipments is concerned. Tens of thousands of tons of all kinds of freight have accumulated in the Lenin section. Pipes, ruberoid, equipment, bricks, house prefabs, beds, and many other things, so anxiously awaited in Surugut, Megion and Nefteyugansk, are just lying there despite the fact that much of it had arrived there one or even two months ago. Everything was stacked up on the rear platforms and in such a way that now it is quite impossible to get at it. For instance, no one knows how much longer four car loads of beds will have to lie here, which have been her since May! They are in the very centre of the platform and can be removed only by a helicopter. Big shipments of equipment for the "Glavtyumen'neftegazstroy" (headoffice of the Tyumen' Oil and Gas Construction) have been lying here since the 9th of June. A drilling outfit has been awaiting its turn to be dispatched since the middle of July.

Meanwhile, a steady stream of new freight cars is arriving at the port daily. Dockers are eager to process them at once. Hence, the piles on the loading platform are slow in going but fast in growing.

A legitimate question arises: what is the reason and who is responsible for the petrochemical industry's shipments overstaying all reasonable time limits on the wharves of the Tyumen' and Omsk ports? There appear to be several culprits.

Comrade PAVEL'YEV, the port's director said: "The Shipping Agency never gives us the tonnage we need and, as a rule, the schedules are disregarded.

Unfortunately, this is a fact! Comrade MAKSAKOV, the port's chief superintendent gives documentary evidence: the tonnage which actually came into the port during the first ten days of July was short ten thousand tons, during the second -- twelve, and during the third -- seventeen thousand. It is true, the port has managed to fulfill its consignment plan. However, it was not the transit cargo for the petrochemical industry but barges full of sand that were dispatched to cover all the defficiencies. Meanwhile, four thousand tons of coal and ten thousand tons of other freight, including six and a half thousand tons of minerals and building materials, scheduled to be dispatched in July, continued to lie on the wharves.

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The ten-day assignment does not correspond with the dispatch plan, although both documents are sent to the port by the Shipping Agency. The assignment calls for 519 thousand to be dispatched monthly but, according to plan, only 456 thousand tons. It appears that this sort of planning takes into account all probable irregularities and delays in the provision of tonnage and even the violations of schedules.

For example, let us look at the month of August! According to schedule, the barge MP-1490 was due to come up for loading on the 3rd. But as late as the 6th it was still in Cherlak. The dumb lighter "Chukotka" was also due to be loaded on the 3rd, but it did not arrive until the 5th and then two days were needed to unload it. The boat "Nyda" was scheduled to be loaded on the 2nd, but it arrived on the 4th and had to be taken directly to the repair yard where it had to stay several days.

In general, the ship-repairmen very often put spokes into the dockers' wheels. According to Comrade MAKSAKOV, the motorships ST-143 and ST-160 were kept in the yard's creek of refuge for over a week; the bottom framing of the barge 1601 was a bit loose and could have been repaired in one shift, but the yard kept the barge for three days; the dumb lighter MT-41 was kept in repair yard for almost a whole month...

Dock workers do not fail to make their "contributions" to the backlog of shipments. The handling of packaged and piece-goods at the Lenin section is poor, and dry-cargo motorships stand idle there in excess of the norm. Dock workers have as yet not learned how to load dumb barges with bricks, bitumen, and equipment on schedule.

"There is one more season," -- says Comrade SERPENINOV, the section's deputy master -- "We are short of dock hands. We have eleven cranes but only fifteen men per shift to handle them, i.e. one half of the required personnel.

Our customers detain the fleet at their jetties. It was their fault that in July the overall demurrage in excess of the norm amounted to 430 thousand tonnage days. This figure includes 130 thousand tonnage-days in Surgut and 197 thousand in Megion (days mean 24-hour periods). Comrade VTORUSHIN, the chief superintendent of the Shipping Agency, gives the following striking examples:

The dumb lighter LK-934 has lost almost ten days at the jetty of the Surgut's SMU-9 (SMU = Construction and Assembly Bureau). The barge MP-1582, through the fault of SU-14(SU = Construction Bureau), was detained at the same jetty for unloading from the 14th to the 26th of July, and LK-956 -- even longer, Particularly slow in the processing of vessels are the organizations of the "Tyumen'neftegazstroy" (The Tyumen' Oil and Gas Construction).

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This is a closed circle: the Irtysh Shipping Agency is short of tonnage, while its fleet is standing in excess of the norm at customers' jetties, in repair yards, and in ports at the loading wharves. Only the joint efforts of river-transport workers and of customers can help us to break out of that vicious circle. And the sooner the better! The author of this article was: L. SHUSTOVA.

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16 August 1966
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(Full text)

A Day on the Ice Route

The hydrologists and weather forecasters, who work by night at the headquarters of maritime operations in the eastern Arctic region, were marking on the map the latest data on the disposition of tracts of ice and on the weather. Their recommendations were broadcast to skippers. In reply radio waves were transmitting short reports about the activities on the Northern Sea Route channel. First two vessels arrived at Tiksi from the Kara sea. They were the diesel-electric motorships "Tsimlyanskges" and "Lena" which have broken their way through the ice tracts of the Vil'kitskiy Straits. The "Lena" is being unloaded but the "Tsimlyanskges" took the course towards the New-Siberia islands. The motorship "Stanislavskiy", which has brought a cargo for Khatanga, dropped anchor at the cape Kosistyy. Piloted by the ice-breaker "Leningrad", the ships of the second convoy passed through the Vil'kitskiy Straits and were heading for the ports of the Eastern Siberian sea. "Leningrad" is now on the way to meet ships coming from the Kara Sea.

The Far-Eastern motorship "Bureyales", which was first to make its way from the east to Tiksi, came back to Pevek. Sailors brought coal from Lena. Pevek's dock workers quickly unloaded the ship and it went back again to Tiksi. The director of martime operations N. NEMCHINOV reported that sailors were honouring the navigational season of the New Five-Year Plan's first year with their tenacious efforts. All deliveries of cargoes to the ports of the eastern Arctic region were being made ahead of schedule. Uppermost attention is reveted on shipments of coal and timber from Tiksi to the Kolyma and Pevek.

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Right now the diesel-electric motorship "Angara" and the motorship "Sungari" are being processed in the harbour of Indigirka. Sailors are handing over their cargoes to the vessels of the Kolyma-Indigirka River Shipping Agency. The crews of three small oil-tankers "Baskunchak", "Temryuk", and "Ekimchan" are pumping over under difficult meteorological conditions, tens of thousands of tons of oil from large-capacity tankers arriving at the bar of the river Kolyma. The author of this article was: V. KNIPPER.

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16 August 1966
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(Full text)

A Start Has Been Made, What Next?

By the end of the Five-Year Plan, the Irtysh Shipping Agency will have transported 1.7 times more cargoes than in 1965 and double the quantity of crude oil. The freight turnover will be increased more than 1.5 times. The growth of the volume of shipments will be achieved not so much due to the reinforcement of the fleet but more by raising the effectiveness and productivity of labour, the introduction of new equipment and of modern methods.

The start of this great effort has been made. In a short period of time, several portal, one gantry and a number of floating diesel-electric cranes, as well as many automatic and electric lift trucks, have been put into operation in ports and on wharves. The use of new equipment, its proper distribution and operation made it possible in the very first year of the Five-Year Plan to raise the level of the mechanization of loading up to 81%.

The up-to-date methods of processing and transporting goods on trays, in containers, and in packages have been adapted. Over 96 thousand tons of freight have been processed in this way. But this figure could have been much higher if all the possibilities were utilized. Masses of containers are in poor technical condition, the turnover of trays is inadequate, and, what is worse, their making is very slow. Out of thirty thousand planned to be in stock at the opening of the navigational season, only one half of that quantity has been delivered to ports. The Tyumen' ship-repair yard, for example, did not produce a single tray, although it was supposed to deliver one thousand. The need for organizing in ports and on wharves special teams for the repair of containers and trays is most urgent.

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Every river-transport worker knows very well the tremendous advantages derived from the operation of crew-less barges. And it is a good thing that at present 258 barges, i.e. more than half of our shipping agency's dumb-vessel fleet, are working according to the new methods. About five hundred workers were released, and over 150 thousand roubles saved. Unfortunately, the introduction of this up-to-date method is not free of shortcomings. At variouspoints the jobs of harbour skippers are still in the hands of badly qualified staff; there is a shortage of spare parts at main-repair depots; and vessels spend too much time standing idle awaiting maintenance service. There are no special harbour installations where vessels could be processsed quickly without casting the anchor. Generally speaking, installations of this kind are not even planned and, apparently, it is up to the Ministry's Technical Directorate to say something about this matter.

To make the fleet ready for the navigational season, the industrial enterprises of the Irtysh Shipping Agency have equipped a number of vessels with complex automatic systems. The staff has been reduced, and the crews have adopted the principle of combined trades. But there are occasions when the automation fails.

During the last few years, much modern equipment and new technological processes have made their appearance at the enterprises of the Shipping Agency. Use is being made of the automatic and semi-automatic welding with powdered wire, welding in the carbonic-acid medium, and of the kapron casting.

Nevertheless, the level of labour mechanization reached by the Shipping Agency's industrial enterprises at the beginning of the Five-Year Plan amounts to 35.6% only. This is obviously inadequate, considering the modern equipment and techniques. One could compare the levels of mechanization of machine-tool and assembly, of pipe-laying and carpenters' work. They differ radically from each other. For example, at the Omsk ship-repair yard, the machine-tool shop has been 58.3% mechanized, but the metal assembly shop -- only 11%. The hull-welding work is the most labour consuming process and, on the average, amounts to one quarter of the overall labour expenditure. But this is where there is absolutely no use for mechanization. And this can be attributed not to the passive attitude of the engineers but to the lack of efficient mechanization adaptable to the repair work. We will never solve this problem without the assistance of the planning and scientific organizations of the Ministry of River Fleet.

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It is bad when the enterprises are slow in introducing and utilizing new equipment. A steel-plating unit has been assembled at the Omsk yard. Over a year has passed, but it is yet to be put into operation. What kind of losses is the yard incurring? Four hundred and eighty roubles a month plus the fact that the unit is taking up more than 80 square meters of otherwise productive area. There just is no explanation for the fact that in the Omsk port there is an LSD-2 disinfection unit which stands absolutely idle although it costs over 700 roubles. The author of this article was: Chief of the Technical Department of the Irtysh Shipping Agency.

Vodnyy Transport
20 August 1966
page 1
(Full text)

The Siberian Catamarans

The Eastern-Siberian Shipping Agency has received at various times over ten motorships of projects 522 and 794 types for its operations on the Selenga and Angara rivers, as well as on the Angara's tributaries. Their sufficiently powerful engines, moderate dimensions, and relatively shallow draught made it possible to employ them extensively for towing dumb barges.

In the course of their operation, however, it became quite clear that they have an excessive tendency to list. A number of restrictions had to be introduced for this type of vessels. Soon some of these motorships were transferred to the category of auxiliary fleet performing the functions of general-service, tender, port-service and manoeuvre craft. Some were taken out of service altogether. And ships which were still used for transporting 600-ton barges, loaded with gravel and sand, worked extremely unproductively. The Director-Captain of the Shipping Agency, A. NAUMOV and the captain A. KARNAUKHOV proposed to use project-794 motorships for making catamaran-type pusher tugs. Members of the public construction bureau, in close co-operation with the authors, have prepared a plan for the joining-up of ships, and the staff of the Irkutsk repair and maintenance depot has built the first catamaran.

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Here are some of its operational and technical specifications: speed -- 14.4 km/hr, speed when pushing a fully loaded 600-ton barge -- 11.28 km/hr, traction effort on berthing hawsers -- 3400 kg. Automatic coupling R-20 MP and two bow buffers were installed on the motorship to enable it to do the pusher-method work.

Tests with a catamaran acting as a pusher tug in transporting gravel and sand loaded 600 and 1000-ton barges, as well as in the capacity of harbour-service craft, have confirmed its good navigational and highly economical qualities. The conversion of motorships into catamarans will pay for itself in the course of one navigational season. In comparison with projects 522 and 794 vessels, the productivity of labour is increased 2.5 times; the overall productivity -- by 60%, while the self-cost of shipments is reduced 2.2 times.

Three catamarans of the Shipping Agency are in service at present. The author of this article was: M. BORZOV, Acting Chief Economist of the Eastern-Siberian Shipping Agency.

Vodnyy Transport
20 August 1966
page 4
(Full text)

The Anxieties of a Small Wharf

Cargoes... They arrive here, in Lensk, from all corners of the country. They arrive by aircraft (fewer) and by water transport (for the most part). Moreover, from year to year, the latter kind is constantly growing in quantity. Here are a few figures for the sake of a comparison.

In 1954, the wharf's freight turnover amounted to 161 thousand tons. In 1959, it was already 274 thousand, whereas in the last year of the Seven-Year period - one million and 14 thousand tons.

"This substantial growth is not accidental", - says Mikhail Alekseyevich POLEV, the harbour-master of Lensk. The reason for that is the diamond deposits discovered in our region in 1958 and their subsequently developed commercial exploitation. We, the river-transport workers, do all in our power and capability to assist in the development of these splendid deposits which represent the true wealth in diamonds of our country. As a matter of fact, our staff has fulfilled last year's plan quite successfully by accumulating 58 thousand roubles worth of additional savings. Neither are we slowing down our tempos during the first navigational season of the current Five-Year Plan. We have fulfilled the assignment for the first half of the year by 107.3% in tons and by 109% in ton/kilometers. We are slightly behind with the plan for passenger traffic only."

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"You may ask", - continues Polev, "why have we not fulfilled the half-year plan for passenger traffic and for the revenues from it? Your question can be given a brief answer: because we had nothing to carry passengers on, and because the service was at an extremely low cultural level. But why was it so and who was to blame, -- that is a different story..."

"Three landing-stages are supposed to be attached to the wharf. Two of them for passengers and one for general service. The passenger stages were spending the winter in the backwater of the fleet base at Peleduy. They were also repaired there. Unfortunately, the job was done so carelessly that, for instance, when the time came to open the shop, the electric wiring had to be first installed by our own people. The fact that these ancient "structures" lack even the simplest washing-up facilities speaks very loudly about their "shining" suitability for the highly cultured service to passengers."

"Now, what is wrong with me, why do I refer to them in plural? Surely, it is high time I mention that one of them, which stood in Vitim, had been staved-in and sank. A puny little barge had to be used instead. These landing-stages are long overdue for replacement, but innumerable requests and applications, sent by Lensk officials to the management of the shipping agency, have so far remained unanswered."

"Well, it is not quite so, - we did hear from them once..."

"The motorship "Berkut" is transporting passengers, mail and often freight on the Lena river, from Vitim to Turukhta. It has been doing so for a few years and it is kept busy. But the trouble is that, during the first period of the current navigational season, it stood idle longer than it worked. The wharf rents this vessel from the "REB (Repair and Maintenance Depot) at Peleduy. As for the quality of repair work there, it has already been described."

"And so, the Lena's "water-taxi" was on the go one day and then stood immobilized for three days."

"Complaints were dispatched in all directions, and the whole matter came to a really disastrous end. The "Berkut" finally had to fold up its wings in Peleduy. and its passengers continued their journey aboard the cargo motorship ST-624. This time the requests had reached the ears of the shipping agency, and the ship's engine was replaced. But what about the plan for passenger traffic? Well, in the first half-year we were able to fulfil only 70% of it."

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The troubles and anxieties of a small wharf. Every hour, nay, every minute these spring up in masses! For example, vessels were supposed to be refuelled in Lensk. The bunker depot No. 8 was planned to be used for the job. But it broke down while it was standing at Peleduy, which is already quite well known to the reader, and it had to be towed to the "Krasnoarmeiyskiy" (Red-Army) plant in Kirensk and put up on the slipway there. The bunker depot No. 6 had to be used instead, which, of course, left the Vitim sector "bloodless".

The state of harbour towing capabilities is poor. At times there is not a thing that could be used for forming up a convoy or for moving dumb vessels to the unloading points. The Lensk wharf authorities are renting their fleet from the very same "REB" at Peleduy. And, one must repeat, its condition is quite deplorable. Let us take, for example, just this one day - the 12th of July. Out of three motorships, two - "Koshevoy" and "Otliv" - were standing by in Peleduy for repairs. Only one ship, the "Aleksandr Matrosov" was moving about the harbour, but by day only. It was found that by night it could not be operated because it had no signal or search lights. Meanwhile, the Lensk port of the "Yakutalmaz" (The Yakut Diamond Project) is working around the clock, and the same is expected of river-transport perssonel.

River-transport personnel at the Lensk wharf is barely 100-men strong, but the port has a least one thousand workers. The wharf has only one floating crane which, by the way, is rented by the diamond mine, while the port has a reinforced-concrete berthing wall, 14 cranes, two of which are portal, automatic lift trucks, transporters, and all kinds of other equipment. Moreover, they expect their facilities to be even further expanded. The wall is supposed to be extended by 150 metres; 8 portal cranes (one even of 100 tons capacity), as well as storehouses will appear on it. All that the wharf's officials have to do is to had over the ship's cargo as per its documentation. The dockers then do the rest.

It is not surprising that the river-transport people begin to wonder who is the real boss on the river? The author of this article was: Ye SREDNEV.

Vodnyy Transport
23 August 1966
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(Slightly abridged)

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Vessels are Ploughing Through Polar Seas

Normally, the most favourable time for navigation along the Northern Sea route and or the work in Arctic ports are the months of August and September. But during the current navigational season difficult ice conditions were still prevalent in the western region of the Arctic and, particularly, in the entire Kara Sea. At the present time, the ice-breakers "Kiev", "Leningrad", "Krasin", "Kapitan Belousov" and "Kapitan Melekhov" are guiding convoys through the ice in the north-eastern part of the Kara Sea. The crew of the ice-breaker "Kapitan Voronin" looks after the ships on the route from the Novaya-Zemlya Straits to Dikson and to the Yenisey gulf. The sailors of all ice-breakers are taking all possible measures to speed up the polotage of vessels going from the West through the Vil'kitskiy Straits into the Laptev and East-Siberia Seas.

During this year's navigational season the break-up of the stationary winter ice in the north-eastern part of the Kara Sea and in the Vil'kitskiy Straits occurred very late. Only the first two convoys managed to make their way through the channel cleared by ice-breakers in the Matisen and Vil'kitskiy Straits. Soon after the break-up of the landfast ice, its shifting, debacles, and shrinkage became a frequent occurence. Despite these condtions, the powerful ice-breakers "Kiev" and "Leningrad" were compelled to guide a third convoy, which was heading for the ports of the East-Siberia Sea, through the Vil'kitskiy Straits.

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Having piloted the vessels as far as the Laptev sea, both ice-breakers steered off on a westward course and approached near the Mikhaylov peninsula the fourth convoy made up of motorships "Khel'termaa", "Vyru", "Biryuza", "Yanales", "Ladogales", "Nevales", "Sayanyles", tanker "Belgorod" and diesel-electric motorship "Rionges". They were all on the way to Tiksi, Zelenyy Mys and Pevek. The channel cleared by "Kiev" and "Leningrad" did not stay open but was again closing up in their wake. Vessels often became stuck in the ice. The ice-breakers had to come back, break the ice around the vessels and tow them one by one through formidable ice obstacles.

This continued right to the very entrance into the Matisen straits. The motorship "Povenets" joined the convoy in the Nordenshel'd archipelago. The ice-breakers "Leningrad" and "Krasin" stayed on their eastward course, but "Kiev" took on the job of guiding the motorships "Novovoronezh", "Olenegorsk" and "Sheksnales" north of Mon's islands. In the Matisen straits the crew of "Kiev" handed over its convoy to the ice-breaker "Kapitan Belousov" and returned to the West.

Near the Vel'kitskiy straits these vessels caught up with those piloted by the "Leningrad" and "Krasin". After that the convoy consisted of thirteen transport vessels and three ice-breakers. As they entered the straits, the situation changed radically for worse. Fresh north winds began to blow, head-drift of ice became stronger, and severe ice shrinking set in. Fog and snow storms made it difficult to find the way.

When the convoy reached the cape Chelyuskin, the ice situation became so bad that even "Leningrad", with all its eight diesels in full operation, could no longer advance. All vessels had to heave to pending a change in the wind and ice conditions. Only in the morning of the 2nd of August the fourth convoy finally managed to get out of the Vil'kitskiy straits and to reach the Laptev sea.

At the same time, north-east of Mon's island, the crew of "Kiev" began to pilot the fifth convoy consisting of four vessels. At present their voyage continues in eastery direction. North wind is blowing, ice is shrinking. The ice-breaker often has to break up the ice all around the immobilized vessels and to tow them one by one.

However, the navigation in polar waters is in progress. The author of this article was: L. ROZANOV.

Vodnyy Transport
30 August 1966
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(Full text)

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A Voyage to the North

On the fifth of September, the motorship "Vatslav Vorovskiy", with tourists on board, will depart on an Arctic voyage. The route of its cruise is: Arkhangel'sk - Solovetsk islands - Dickson - Dudinka - Igarka - Arkhangel'sk - Murmansk. The cruise is scheduled to last twenty days. In all of these ports tourists will have the opportunity to do sightseeing. This is the first cruise of its kind, and its organizers will do their best to make it interesting and facinating.

"Vatslav Vorovskiy" is an excellent vessel, and its crew consists of the "Communist-Labour" sailors. Comfortable two and four-berth cabins, music room library, games room, two restaurants and a bar are at the disposal of all passengers. Feature films will be shown during the voyage.

The vessel will be skippered by the young captain V. PETROV. The author of this article was: S. BYKODOROV, the navigator.

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30 August 1966
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MISCELLANEOUS

The Riddles of "Northern Sphinx"

"The 'Northern sphinx' is apt to remind of itself whenever people seem to forget about."

With these words Igor Nekrasov, a research worker from the Institute for Permafrost Studies, the Siberian branch of the USSR Academy of Sciences, took a heap of photos out of drawer in his writing table. They showed staring window apertures without frames, cracked walls, decrepit balconies...

Quite a few pages in the history of mankind are devoted to the struggle against the vile forces of the "Northern sphinx" - this is how permafrost is respectfully called in popular science literature. The Americans in an attempt to protect one of their northern highways against permafrost used 50 flame throwers to fight icing. About 50 million gold roubles were spent before the October Revolution by the administration of the Transbaikal railroad to defeat the treacherous enemy.

Permafrost is one of the mysterious phenomena of nature. One can hardly believe that the green expanses of taiga, the fertile fields, the mighty northern rivers, finally, the coastal waters of the Arctic Ocean all rest on frozen ground. Nonetheless it is a fact, that is as indisputable as that nearly half of our country lies in the permafrost area.

True, permafrost is often treacherous and merciless. But to brand it for this reason as a human enemy would be erroneous. Frozen grounds are noted for highly interesting properties. Not infrequently are they so strong as to be able to hold the weight of huge structures, to serve as a reliable roof in mine workings. They are water-tight. It has been proposed recently even to use frozen ground rather than concrete as a core in one of the northern dams.

...I had a chance recently to visit the establishment where the strategy and tactics for permafrost "harnessing" are being worked out. This institution known as the Institute for Permafrost Studies, the Siberian branch of the USSR Academy of Sciences, lies in a picturesque suburb of Yakutsk.

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The Institute is very young, as well as the science of permafrost itself. Its initiators were Academician V.A. OBRUCHEV, Professor M.I. SUMGIN and the now active N.A. TSYTOVICH, Corresponding Member of the USSR Academy of Sciences. It owes its birth to practice, to mass construction in the country's North, to a search for solutions of purely practical problems, for instance, how buildings should be erected on frozen ground and pipelines laid in it.

The riddles of permafrost are so numberous that their solution is impossible unless by a joint effort of the scientists in different specialities, thermal physicists among them. Nikolai IVANOV is one of them. The most curious thing in his small and cosy study seems to be an ordinary blackboard. It is IVANOV's habit to draw schemes and formulae as illustration to his words. How numberous are the problems put before thermal physicists by permafrost! For instance, we know that water converts to ice at a zero temperature. But in frozen grounds, water may remain liquid even though the temperature has fallen down to 20° below zero.

Nearby the Institute's main building a hillock was pushed out of the ground by some gigantic force. It is the so-called phenomenon of "swelling". Permafrost is capable of squeezing out of the ground piles and columns. Houses would then collapse and engineering structures put out of action.

A good deal of problems, each being ultimately related to practice. In the given case one must correctly compute the thermal conditions of the frozen ground beneath a residential building, industrial structure dam, water reservoir or hydro-electric power station. A most powerful weapon, viz. the scientifically-valid guiding principle, is made available to both designers and builders.

Nikolay IVANOV is in his early forties. He has been living in Yakutsk for over a quarter of a century. Here at the Institute he obtained his Master's degree and has prepared a D.Sc. thesis. His enthusiasm is inspiring for the staff of the laboratory, mainly young men.

Young people are everywhere - at the "clever" electro-integrators, at the numerous highly complicated instruments. One of the young men is Leonid CHISTOTINOV, the laboratory's senior engineer. He shows us the country's unique setup for physical modelling of the processes taking place in the thick of frozen ground. A special trough can be used to reproduce a part of a river or a lake, a building or a dam for a hydro-power station.

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Working hand in hand with thermal physicists are specialists in mechanical physics. They are most directly concerned with building practice. Incidentally, they are the ones who have sunk deepest into frozen ground. At a 15 metre depth below the surface in a spacious chamber where the floor walls and ceiling are sparkling with icy crystals both in winter and summer I interviewed Andrei ZHYGULSKY, a senior engineer at the laboratory of frozen ground mechanics, a specialist in pile foundations.

The staff of "mechanics" headed by the thirty-year old Stanislav GRECHISHECHEV, (M.Sc.), is studying such probelms as strength, creep and compressibility of frozen grounds, as well as working out a rational system for dealing with such grounds in pits and mine workings.

The new piles have produced a revolution in the country's northern and eastern areas. The Yakutsk practice is to drive piles into the earth after the frozen ground has been steam-treated. In Norilsk holes are first drilled for them. A cheap and strong foundation! According to Professor P.I. Melnikov, head of the Institute, it is one of the major achievements of the permafrost scientists.

Only quite recently the first multi-storeyed building in Yakutsk was put by the constructors on the "hen's feet", on thin reinforced-concrete piles. Today scores of beautiful up-to-date buildings -- all on piles -- have lined up along the capital's main street, the Lenin Avenue.

In the silence of the ice-clad underground chamber the scientists are testing the piles for the so-called carrying capacity. The results are just stunning. The inferences drawn from experiments and computations have already enabled millions of roubles to be saved for the country. The lack of knowledge in the past accounted for huge foundations installed at maximum depth. It was later proved that the load on the frozen ground can be safely increased 2 - 2.5 times. Another storey was added to the houses in Yakutsk. The projects were revised.

If the knowledge of permafrost were represented in the form of a pyramid, the laboratory headed by Nikolai GRAVE, D.Sc., would be at the top. This smart man with an appearance of a sportsman has spent half his life in expeditions, gouging glaciers, drilling holes in the desert high-altitude ridges of Chukotka and Yakutia, and floating along the Lower Tunguska River.

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The general permafrost laboratory is combining the results of all the laboratories to turn out complex "products". Several monographs on separate permafrost areas with a detailed account of permafrost phenomena have been recently published. Practical men turn to them for charts as well as recommendations.

Recently another expedition headed by I. NEKRASOV returned from Transbaikalia, where the Udokan copper deposits are going to be developed in this five-year period. Serious corrections have been made available to the designers.

In the past 10-15 years plants and multi-storey buildings, railroads and airfields were erected by Soviet man in the kingdom of "northern sphinx". The permafrost scientists rightly claim that some credit for what has been achieved is due to them. Recently one of the Yakutia's newspapers carried a triumphant heading: "Northern Sphinx is in Harness !".

Pravda
14 July 1966
(Full text)

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Seven Kilometres Deep Into the Earth

A location has been selected on the Kola Peninsula for a unique well: after reaching the depth of seven kilometres, the auger will enter the earth's upper mantle the composition and the physical properties of which are unknown to the researchers. The Scientific Secretary of the Geological Institute at the Kola Branch of the USSR Academy of Sciences, V. TYUREMNOV, has declared that on the Kola Peninsula, unlike anywhere else, the basaltine layer is close to the earth's surface, a factor which makes it possible to carry out super-deep drilling. The Arctic is just the place where, besides the exploration of the upper mantle, the auger will help to determine the natural laws and possibilities of new discoveries of minerals on the Kola Peninsula.

Trud
3 August 1966
page 4
(Full text)

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The Town of Health

Ever wider and higher grows the Arctic city of Vorkuta. Its streets make their way ever farther into the tundra. The buildings of the town of health are rising in one of the outskirts.

There is day-light now round the clock in the Arctic -- the most advantageous time for builders. And they certainly take full advantage of it. The rhythm of work is at full swing day and night on the construction grounds.

"The workers of the 12th Construction Department are preparing an excellent gift for the residents of Vorkuta" -- states the chief surgeon of the Central Hospital, I.N. CHUMAK. In time for the 50th anniversary of the Soviet Rule the main structures will be ready for service. In full operation will be the central polyclinic, the childrens' hospital, the maternity hospital, and the antitubercular dispensary.

The Vorkuta Medical Centre occupies an area of several tens of hectares. The author of this article was: S. OSIPOV.

Stroitel'naya Gazeta
21 August 1966
page 3
(Full text)

A Class of Future Geologists

The Ministry of Education, The Yakut Branch of the Siberian Section of the USSR Academy of Sciences, and the Geological Administration of the republic have made the decision to organize classes for future geologists in one of the Yakutsk schools.

Experienced specialists and university teachers will lecture for two years, first the ninth-grade and later the tenth-grade students, on mineralogy, field geology, petrography, and paleontology. Students will learn the polishing skills and the technical photography in the laboratories of scientific organizations and of the university. In summer, they will take part in expeditons into the field.

Young men will be hardened, will become intimately familiar with nature, and will be enthusiastic about their work before they join the geological faculty. They will make excellent explorers of mineral resources. And those who will not immediately enroll in a university will be readily employed as preparers and collectors by geological institutions.

Izvestiya
27 August 1966
page 4
(Full text)

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JOINT INTELLIGENCE BUREAU
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THE VERY NORTHERNMOST

STATE PUBLISHING OF GEOGRAPHICAL LITERATURE

MOSCOW 1960

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Chapter 4 - (18 pages)

The Fires of a Great City;

Still another Norilsk;

After 7 years;

Palms in the Tundra;

Television beyond the 69th parallel;

About those who made the city famous;

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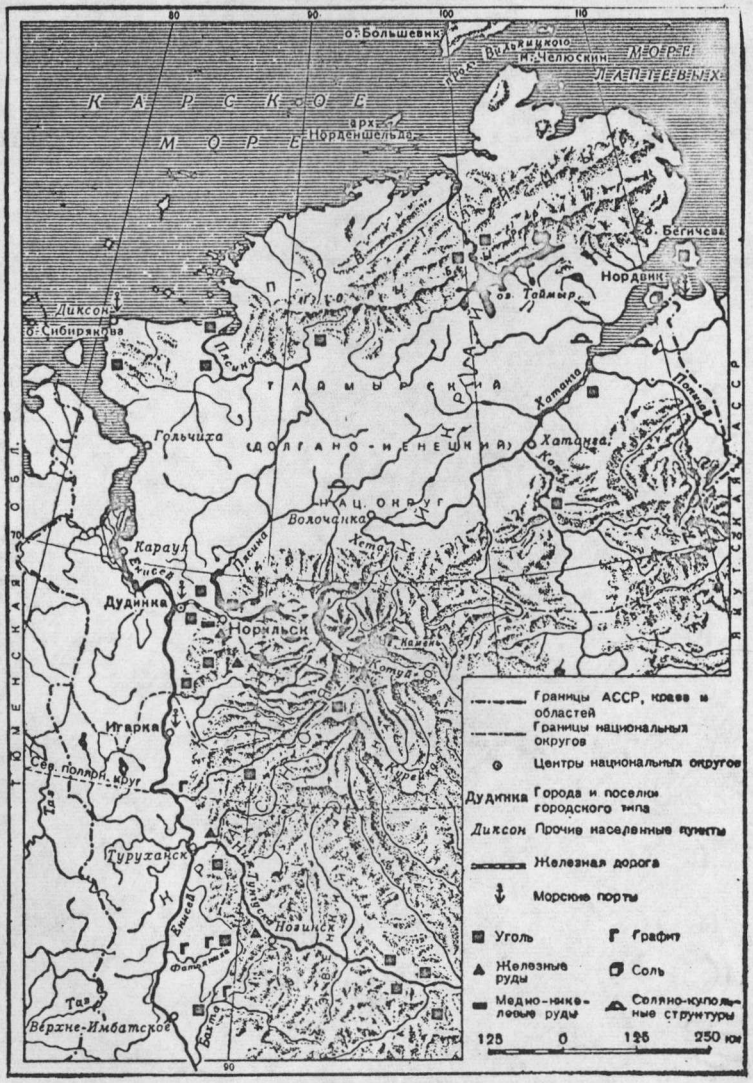
INTRODUCTION

Norilsk lies beyond the 69th parallel, 12 hrs flight by "IL-14" from Moscow. In the future, this time will be reduced to 6 hrs. by the "IL-18" aircraft.

There are 2 flights per day to Moscow.



Географическое положение Норильска

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Map: Geographic Location of Norilsk.

Scale: 3/4" = 250 km.

Legend:

- Boudaries of ASSR's Kray's, Oblast's.
- Boundaries of National Okrugs
- National Okrug Centres
- Railroad
- Seaports
- Coal
- Iron ores
- Copper-Nickel ores
- Graphite
- Salt
- Salt-Cupola Formations

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THE VERY NORTHERNMOST

Selected passages summarized or extracted.

The famous northern seaway explorer Admiral Makarov wrote in 1898: "The coal deposits within 100 versts of the settlement at Dudinka are an important resource available to the sea route on the Yenisey. Dudinka coal is of the best. In 1894, the Naval Ministry commissioned the trader Sotnikov to mine and deliver 20,000 puds of the coal to Dudinka. Sotnikov employed five men at the coal mine, while the coal itself was hauled into Dudinka on reindeer. According to Colonel Vil'kitskiy, Dudinka coal compares with the best of Cardiff coal in quality".

The foregoing passage was taken from Vice-Admiral Makarov's account of his inspection, in the summer of 1897, of seaway along the Ob' and Yenisey rivers spb., 1898, pages 68-79.

In 1919, the young mining engineer N. Urvantsev with two topographers and three workers carried out a survey of the Taymyr Peninsula in search of coal. After a lengthy search the party finally reached the cone-shaped, white-capped volcanoes.

There should be coal in the Norilsk mountains. In 10 short days the vastness of the coal deposit was established.

A larger party returned in 1920 and this time Urvantsev discovered, besides the large coal deposits, an even more remarkable deposit of copper-nickel ore. It was not clear now why the copper smelted by Sotnikov appeared "pale". The copper ore also contained nickel.

In the course of a detailed survey of the area names were given to various localities and topographic features. In this manner "Medvezhiy Ruchey", "Ugol'nyy Rouchey" and others got their names. Seated at the campfire, the geologist Urvantsev would tell his party of the geological history of the Kray.

"The Sredne-Siberskoye Plaskogorye, said the geologist, takes up an enormous area. It stretches from the Yenisey to the Lena river and from Angara to the Arctic Ocean. Approximately a billion years ago a mountainous country formed as the result of folding of the earth's crust. The mountains gradually deteriorated, while fluid masses of magma from the depths of the earth cemented an extensive area of the earth's crust and made it so rigid, so hard, that further underground movements caused only slight undulations. We geologists call such areas "platforms".

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On the edges of the platforms, for this reason, where the rivers deposited a mass of eroded material from the deteriorating mountains, the earth's crust was depressed and new deposits were formed. Mountain ridges rose from the bottom of the ocean on the edges of the platform. The area in which we are working, here in the Norilsk raion, continued Urvantsev, is located in the northwestern corner of the Siberian platform, there, where the Yenisey zone of folding began.

At the dawn of organic life, which was approximately 500 million years ago, the plain between the Yenisey and the Lena was subjected to slow lowering and it was flooded by a shallow sea. Thus, you and I, my friends, are at the bottom of a shallow sea, the geologist said with a smile. For millions of years various limestones, dolomites, marls, sandstones and slates were formed on its bottom. Evaporation took place in shallow lagoons, the precipitates settling out contained gypsum and rock salts.

Due to the formation of mountains on the edges of the platform it began to warp and rise, and the sea gradually left it. The central part of the platform became drier, while extensive low-lying swampy plains formed on its edges. This was in the geological period we know as the Permian epoch, when vegetation moved for the first time out of the ocean on to the dry land.

Ferns similar to trees, gigantic horsetails, great trees with sparse large leaves up to a meter in length, formed the dense forest of that time, thicker than the most impassable present day taiga. Having fallen on the bottom of the swamp, the trees lay there without access to air.

In this way the beds of fossil coal which we see at the foot of the mountains were formed. The enormous Tunguskiy hard coal basin was formed on the site of the Siberian platform. Our Taymyr coal is part of this endless basin.

Do you know why the coal which we are burning contains so much ash? Urvantsev asked. This question is also answered by geological history.

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Gigantic active volcanoes rose above the dense forests. They emitted ash, lava and clouds of water vapor from their craters. Falling on the swamps, the ash littered these and mixed with the trees lying therein. It is for this reason that the Taymyr coal differs from Donetz and Kusnetz coal by its high ash content.

The number of volcanoes grew steadily and their activity increased. In the south of the Siberian platform the extensive streams of basalt lava flowed through the cracks. On encountering the coal beds, its high temperature and gas content acted on them. In a number of places the coal was converted into graphite. The graphite deposits in the Yenisey-Lenskaya Oblast' are the greatest in the world.

However, the flowing magma, rich in oxides of magnesium, calcium and iron, found it difficult to penetrate the thick platform and it colled without reaching the surface. On the edges of the platform, in such localities as our Norilsk raion, it was easier for the magma to make its way through, and for this reason industrial deposits of ores accumulated here.

The sulphur and sulphide compounds of metals, dissolved in the magma, began to separate out in the form of the tiniest of droplets. These combined into larger drops and gradually cooled, forming veins and lodes. Such is the rich vein collection which we found on Rudnaya mountain.

The magma cooling in the upper layers of the earth's crust formed deposits of impregnated copper-nickel ores. It is difficult to evaluate the reserves, since, you see, we have only begun the explorations, but it would appear, and the geological history supports the view, that we are dealing with a large, rich and promising deposit.

The history would be incomplete, Urvantsev continued, if we do not recall still another episode which changed the present aspect of this place. Approximately half a million years ago all of the north Yenisey-Lenskaya Oblast right down to the lower Nizhnaya Tunguska river was buried beneath a gigantic glacier. It was about a kilometer thick in the Norilsk region.

These glaciers account for the lakes in the area as well as for the variety of clays and sands, gravels and boulders found at every step throughout the area.

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Rich as the treasures of the Norilsk mountains may be, ended the geologist, they comprise only a small part of the natural riches of Tâymyr, which can be truthfully called "the peninsula of treasures". Coal and graphite, copper-nickel and nepheline ores, fuel gas, mica and rock salts is what we already know of the Taymyr riches. Its geological history makes it possible to predict that oil will also be found here". The foregoing passage was taken from "the explorations of N.N. Urvantsev 1919 to 1921". The geology of this Kray has been studied by such famous Soviet geologists as Vorontosov, Kotul'skiy, Rozkov, Sobolev, Gregorev, Rozanov, Domarev, Smirnov, Rogover, Moor, Dominikovskiy and others. In his quest for a water route into the Norilsk area, Urvantsev and a couple of his co-workers, in 1922, set out down the Norilsk river across Lake Pyasino, along Pyasino river down to the Kara Sea. This route proved navigable all the way and, incidentally, in the course of their travels along the coast to Dikson they found some papers left behind by Amundsen's expedition. These were the papers which Tessen and Knutsen were supposed to have delivered. In all, Urvantsev's party traversed 1,350 versts by fishing boat. The ore samples from Norilsk were assayed in laboratories and they were found to be as rich as the copper-nickel ores of Sudbury in Canada and Bushveldt in South Africa. For this reason Norilsk was long known as the "Soviet Sudbury". The analysis showed that the nickel and platinum group metals of the Norilsk ores are closer to the South African, and even exceed these, the South African ores are much richer in nickel than is the Sudbury ore. The Sudbury ore has a negligible amount of platinum, while the Norilsk ore is rich in platinum. In 1925 detailed prospecting of the Norilsk area was going full blast. The building of the Norilsk mining and metallurgical Kombinat began in 1935.

It was built under extremely adverse conditions. In 1936 a narrow-gauge railway was built from Valek on the Pyasino water route to Norilsk. The builders of this railroad called it "their window on Europe".

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CHAPTER 2

On the Rim of the World

The coordinates of Norilsk are 69° 19 min. north latitude, 88° 8 min. east longitude. Two thousand kilometers of swampy tundra separate it from the Siberian trunk railway. It is much nearer the North Pole than it is to the Kray center of Krasnoyarsk.

The Norilsk river flows into Lake Pyasino. Its bed was originally formed by glaciers. The river is 35 kilometers long. The town is situated on the left bank of the valley.

The industrial area and the settlement, which were the beginnings of Norilsk, are located directly at the foot of the mountain range on the Norilsk plateau, while the town itself is somewhat further north, down in the valley. Three ranges approach it from the south, on the west is Schmidt Mountain, in the center is the Rudnaya Mountain range and on the east is the Barernaya Mountain range including Mount Gudchikhaya, rising 500 meters above the Norilsk bench and itself is 100 meters above sea level.

The Putoran Mountains are visible to the east. Only on the west and northwest of Norilsk is it open, here the endless level tundra stretches out to the Arctic ocean.

The climate here is raw and changeable. The lengthy winter with its severe frosts, winds and snow storms alternates with a short rainy summer of frequent fogs, abrupt changes in the weather and fluctuations in atmospheric pressure. When the Noril'chans are asked about the climate they answer "we have, in all, twelve months of winter, the rest of the time is nothing but summer".

This jest has a serious basis. The snow melts at the beginning of June, and by the end of September it has again covered the ground. Last winter's snow frequently stays through to the next fall on the steep mountains and in the ravines. Frost occurs during 8½ months of the year, and approximately one quarter of this time has frost up to -30°, the temperature frequently drops to -40° and even to -45° and -48°. Mercury thermometers are not of much use because mercury freezes at -39°. The average temperature of the coldest month of the year, which is January, is -25°; in Moscow the corresponding temperature is -10.8° and at Krasnoyarsk it is -18.2°. Even though the warmest month of the year, which is July, has temperatures of +14° and as high as +30°, the summer is short and the average yearly temperature is -9.3°.

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They not only have night during the day in Norilsk, but day at night. The so-called white nights occur in the spring and in the fall.

Beginning with the night of the 19th to the 20th of May, the sun does not go below the horizon. It maintains this sentry round for 68 days. Due to the refraction of the sun's rays, the polar night is three weeks shorter than the polar day. The sun sets again on the 25th of July and the white nights begin anew. Cooling and frost normally begin at the end of August. By the end of September the mountains have donned their snow caps, and ice covers the lakes and rivers.

In January of 1957 a two-day hurricane hit Norilsk. The wind velocity during this period remained above 34 meters per second, and at times reached 40 to 45 meters per second. The air temperature was from 16 to 22° below zero, and the atmospheric pressure stood at 686 millimeters. A similar hurricane, or as they say here, "a black blizzard", had not occurred since 1938.

Strong winds are not a rare thing in Norilsk. These blow for several says at a time. The yearly average wind velocity here is about 6 meters per second. Strong winds still hamper the work of builders, railroaders and miners.

Winds above 15 meters per second make movement by man in the open very difficult.

The effect of the climate on a man's health is determined by a special coefficient: "chill factor". Each degree of frost is equated to 1 weighted point of "chill factor"; and every unit of wind velocity (meter per second) is equated to 2 points. With a "chill factor" of 45 points and above all outside work ceases. From October through to May outside work ceases due to weather on an average of once per week, and in the open pits even more frequently. Weather with winds of 30 points occurs throughout half of the winter. In December of 1955 a record "chill factor" of 94.8 points was noted, this occurred with frost of 26.8° and a wind velocity of 34 meters per second.

Outside work is not permitted at temperatures of -40°, irrespective of the wind, and at a wind velocity of 22 meters per second, whatever may be the temperature.

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The micro-climate of the twon is generally noticeably different from the micro-climate of the Norilsk plateau. In the valley where the town is situated, the cold air accumulates during the winter. In summer, the air in the valley becomes warmer because it is better sheltered from the winds. For this reason the temperature in the city is normally lower during the winter than it is in the mountain regions and higher in the summer. The snow cover normally stays a few days longer on the mountainside and in the vicinity of the mines than it does in the town. Yearly average precipitation in the Norilsk valley is 359 millimeters, this is half as much as, for example, in Tomsk. Nearly two-thirds of all precipitation is in the form of summer rain. The snow cover does not amount to 1 meter. However, snow storms sweep-off the level sectors and build up snowdrifts on the railroads and highways, around various buildings and in the streets.

At the end of the war, railroad engineer M.G. Potapov came up with a clever idea. Since the wind builts up snowdrifts, then let it clear them away. Potapov built snow fences on the "active principle". They differ from the conventional snow fences in that the lower two meters are bare, and, having stopped the snow, they permit the air current to continue on and sweep clear the railroad or highway. These 5.5 meter high panels are sufficiently strong to withstand the pressure of winds up to 40 meters per second in velocity. They have become the main type of snow fence in Norilsk. Besides these fences, use is made of portable panels, lattice fences, trenches in the snow and covered galleries.

The combined length of snow protection devices in Norilsk amounts to 310 kilometers, this is exactly the distance from Norilsk to the Arctic Circle. The permafrost begins at the town of Turukhansk; at Igarka the permafrost layer is 20 meters, in the vicinity of Norilsk it is from 200 to 250 meters.

In the vicinity of Norilsk, the temperature of the permafrost is stable, it is 4° below zero.

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Navigation on the lower waters of the Yenisey lasts only four months. Seagoing ships can come through the Kara Sea only three months of the year. The ice normally begins to clear away at Dudinka on the 3rd to 5th of June. Its earliest clearing was noted on the 26th of May 1943, and its latest was on the 26th May 1943, and its latest was on the 26th of May 1943, and its latest was on the 16th of June 1916. The earliest freeze-over at Dudinka was observed on the 15th of October 1912, and the latest freeze-over was observed on the 4th of November 1947.

The ice-free period is extremely variable on the Pyasino river, and in 1963 a convoy of boats hauling freight up this river from the Kara Sea was frozen in and its freight was delivered in the following year.

The Norilsk river is only 57 kilometers long. Two other rivers flow near Norilsk, these are the Rybnaya and the Talaya. Due to their swift current, these two streams never freeze over. The rivers and lakes around Norilsk are full of fish. There is a plenitude of nelma, pike, sturgeon, grayling, muksun, taimen, whitefish and char among others.

This is a hunter's paradise as well. There is a full bag of the following, among other game: buzzards, merlin falcon, long-billed snipe, hazel and wood grouse, sandpiper, eagle, a multitude of geese and ducks, swan and willow grouse. The fox and muskrat are the pride of this area. They produce a beautiful pelt. Incidentally, the musktrat was brought in here 10 years ago and has acclimatized remarkably well. Among other wild animals are the wolverine, rabbit, wild reindeer and the wolf, which the dolgan called "irichi" or bush-tail, and bear, which is respectfully called "amaka" i.e., grandfather.

In spite of the thick layer of permafrost, the boundary of the forest extends farther north here than it does anywhere else in the world. It reaches beyond Lake Pyasino and stretches to the northeast towards Khtanga. Norilsk is situated on the boundary of the tundra and the forest tundra.

Among the trees growing here are the larch and spruce, which reach heights of 15 to 20 meters. Other trees are birch and willow, red currant, sweet briar, occasionally there are raspberries and spreading juniper. The first settlers in the area cut down the forest and its replacement is very slow growing. It takes approximately 100 to 200 years for a tree to grow to a diameter of 40 to 45 centimeters.

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Grassy vegetation grow here for about 2½ to 3 months. The grass grows at a rate of tens of centimeters per day. Leaf develops from the bud stage to its normal size in about a week and a half, and if the spring warm-up sets in abruptly without a gradual warming trend then the leaves reach full development in three days.

There is a frightful scourge of mosquitos here in the summertime. They are particularly numerous out in the open tundra. The first builders here had to work under mosquito netting continually.

The effect of the sun's radiation during the summer, and mainly the ultraviolet radiation, is favorable to the human organism, it increases the metabolism and increases the power of the muscles. During the polar night there is a deficiency of ultraviolet radiation. At the present time there is widespread use of artificial ultravilet radiation, but in the first years of construction out here, the workers suffered from this deficiency in ultraviolet rays.

The initial period in Norilsk is very difficult while the organism is adapting itself to the climate. Towards spring even the healthiest people appeared tired, and lethargy is evident. The extreme fluctuations in atmospheric pressure are detrimental to heart conditions.

In 1937, coal mining began at the first pit on Schmidt mountain, a limestone quarry was also found. Norilsk ores differ in composition from all other deposits of sulphurous copper-nickel ores. It was necessary to develop their own peculiar technology for extracting the polymetal.

In the winter of 1941 an "air bridge" was established between Norilsk and the "mainland". Soon, nickel plate was the freight going out on aircraft.

Prior to 1939, a temporary electric power station was in operation at Norilsk, producing 6000 kilowatts. In 1939 construction was begun on a thermal power station. It was built on the side of the cliff. The station was put into operation in 1942, producing 25,000 kilowatts of powr

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CHAPTER 3

The Very Northernmost in the World

Six cubic meter shovels load the ore. This ore contains 25 elements of Mendaleev's Table. These are nickel, copper, cobalt, platinum, palladium, ruthenium, iridium, rodium, osmium, titanium, selenium, iron, gold, silver, sulphur and others.

This kombinat is not only the most northerly, but is one of the largest in the country.

Open pit mining is done in the ravines between the Schmidt, Rudnaya and Barernaya mountains.

The quarry "Medvezhniy Ruchey", is the largest undertaking in Norilsk. It is one of the newest amongst the mines, it was opened up at the beginning of the war and has already become the main source of raw materials. During the 7-year period ending in 1965 the extraction of ores here will have been doubled. The "Medvezhniy Ruchey" will daily produce hundreds of trainloads of ore mass. Trains will leave its slopes every five minutes. It is planned to work the quarry until 1988.

By the way, these periods are relative. When the "Ugol'nyy Ruchey" (quarry) was opened in 1940, it was estimated that it could be worked until 1957. But it was still producing a considerable amount of ore even at that time.

One more hazard has been added to the underground work in the mines, this is the presence of methane gas. The miners are now approaching the lowest and richest ores, these strata are most heavily impregnated with methane gas. A method of removing the gas has already been worked out. In this method the gas is not discarded but is used in burners, being converted into gas heating.

The surveyed and estimated geological reserves of only one deposit, that of Norilsk-I (Rudnaya mountain) ensure the kombinat's operation for approximately 90 years. Ore extraction in the seven-year plan will increase by more than three-fold, but then the surveyed reserves are increasing also. Besides the deposits under development, there are others, such as Norilsk-II, Chernaya mountain and Zub mountain. Exploration continues and the size of the reserves has not yet been determined. Geologists in the Norilsk raion have established the presence of ore at 31 places (Norilsk plateau, Syverma, Lake Lama and Karaelak mountains).

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Not far from the quarries is the multi-storey concentration plant. It was not possible to locate all of the shops here. The initial heavy crushing takes place at another site. In Norilsk, this factory is called the BOF (Great Concentrating Factory). It is large indeed and is one of the greatest in the country.

The smelting process in use up to this time resulted in a great loss of metals in the slag. Since 1959, nickel is being smelted in the elctro-thermal furnaces. This will result in an economy of tens of millions of roubles, and will free many qualified workers who are required in the other shops of kombinat; extraction of nickel will increase by 4% and that of cobalt by 10%. It will no longer be necessary to mine coals and produce coke, which will improve health conditions in the plant. One large electric furnace is already in operation, it is the first built by our own industry. Two more such furnaces will be installed. This will make it possible for Norilsk to produce 30% more nickel in 1965 than was produced in 1958.

Copper smelting is ten years younger. A real giant of metallurgy grew up in Norilsk in 1952 to replace the small copper plant. The discharge gases of the establishment are processed for sulphuric acid, which is necessary for metallurgical processes.

The development of technology for extracting cobalt from the side products of nickel production is a great achievement of the Norilsk engineers. Opened up in 1945, the plant continues to give a considerable amount of the All-Russia production of cobalt, a greyish white metal of great value in metallurgy, it is an outstanding blue color additive for glass. In the 7-year period its production will increase by 52%. There will be increases in the production of other metals as well.

The electric power plant is the heart and soul of the kombinat and of the city.

The 40°. water from this power station is dumped into Lake Dolgoye and for this reason the lake never freezes over. In winter particularly, the lake is covered with a pall of fog.

The size of the thermal power station will be increased by one and one-half times during the current 7-year plan. Several new high pressure boilers and two turbines will be added.

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There is an interesting project to build an electric power station on Lake Khantayaskoye, within 120 kilometers of this city, by the year 1970. It is estimated that this station could produce 400,000 kilowatts of power at a cost of 1.3 kopek per kilowatt hour.

Thermal power stations require much fuel. More than 50 fossil coal deposits have already been found in the Norilsk raion. Their reserves have not been sufficiently accurately estimated but it is a guess that these will fall within the hundreds of billions of tons. The Norilsk basin compares with the Donetz basin. The thickness of the beds in Norilsk exceeds one meter as a rule, and in places reaches 15 to 20 meters. Anthracite and lean coals occur in the west of the raion, while on the east there are coke coals and steam coals. Only two deposits are being worked at the present time, these are the Norilskoye (66 million tons) and the Kayerkanskoye, which is located 20 kilometers to the west (500 million tons).

The rail line from Dudinsk to Norilsk was replaced by a wide gauge track in 1953. The amount of freight carried exceeds that of 1937 by 70 times. The 7-year plan includes complete electrification of this rail line.

The airlines now carry more than 40,000 passengers out of Norilsk per year. There are regular flights to Krasnoyarsk, Igarka and Dudinka.

Work under these conditions has demanded great inventiveness on the part of all concerned. The chief mechanic in pit No. 18, Ivan Obydennov, was the first to solve the problem of grounding cable in the mines in the polar regions.

Because of the absence of sprinkling, it was not possible to use the combine "Donbass" in the thick beds of coal. The Norilsk workers constructed new coal-loading machine, they created a clever adaptation for local sprinkling in the drift, where the dust is likely to explode like powder. Remote control apparatus and automatic loaders are now in use in the Norilsk mine.

Radioactive tracer atoms are being used in the laboratory.

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More than 300 engineers are working on masters theses, while thousands of workers engaged in studies at the technical schools. Technical thought does not lag in this far northern town. Shops for new technology have been established in the metallurgical plants. These are engaged mainly in developing methods of automation. During the seven years from 1959 to 1965, is intended to fully mechanize and automate the thermal power station and the metallurgical plants. It is planned to decrease the number of workers at the concentration plant to 1/3 the present number. It is planned to make the metallurgical plant the leading mechanized and automated establishment in the country, at which several thousand fewer workers will be employed than there are at the present. It is estimated that this will result in an economy of 350 million roubles per year. At present, the cost per worker in the polar regions is three times greater than comparable costs on the "mainland".

It is planned to process the slags in Norilsk, since from 1/3 to ½ of their weight is made up of iron, as well as a considerable amount of left-over nickel.

A task for the future is the extraction of large quantities of titanium, vanadium and gallium from the tailings at the concentration plant.

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CHAPTER 4

The Fires of a Great City

In 1939, the Norilsk population was less than 17,000 residents, in 1944 it was 20,000 residents and today (1960) it is about 108,000 persons.

In the permafrost, buildings cannot be set up on ordinary foundations, because the permafrost would soon thaw and the building would collapse. In Norilsk, the foundations are in the form of pillars which are buried to 5 and more meters, instead of an underground basement. This technique creates "conservatories" of permafrost which prevent its thawing in the summer. It has been established that such a foundation can support a 20-storey building. Experiments showed that it was unncecessary to implant the foundation much deeper than 5 meters. This has resulted in an economy of 400,000 roubles per apartment building.

Scientists have also established that it is possible to increase the load per square centimeter on permafrost from 4 kilograms to 8 and 10 kilograms per square centimeter.

However it is not possible to always prevent the thawing of frozen ground. Should water from the supply lines into the building somehow get into the ground, then thawing sets in. The ice which has kept the ground in a solid condition becomes converted into water, undermining the building. These conditions are combatted in a number of ways. One technique is to force cold air down underground shafts. This results in re-freezing of the ground, however, there is no guarantee that it will not thaw again. Another method is to fill the thawed areas with cold concrete.

The concrete method has a great future. Introduction of concrete in place of thawed ice will make it possible to completely avoid the digging of trenches for laying foundations.

In 1958, the technique of drilling a cylindrical hole and placing reinforced concrete pilings in these holes was introduced. In winter these pilings freeze to the ground so securely that the load is distributed throughout the ground and not only on the pilings themselves. This method has resulted in an economy of hundreds of roubles per cubic meter of living space.

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New building material, such as slag-concrete blocks, fiber-cement plates, etc., are being turned out. In the period 1956 to 1958, 111,000 cubic meters of living space were built up.

At the present time, 350,000 cubic meters of living space are under construction in Norilsk, and from 1959 to 1965 it is planned to build an additional 400,000 cubic meters of living space. Besides, this is expected to be accompanied by a reduction in population numbers.

Fruit is brought in by aircraft, fish are obtained from the fish plant on the Val'ka, and milk and vegetables are raised locally. Five thousand square meters of hothouses are taken up with tomatoes, an nearly as much with cucumbers. The yield is no less than that of the best hothouses in Moscow and Leningrad. They have even introduced bees, and hives stand in the hothouses.

Experiments have shown that it is necessary to use both incandescent and luminescent lighting for proper maturation of the plants, particularly tomatoes.

Vegetables are also grown in the open fields. 25 hectares of cabbage gave a very good yield. The extremely long days and 24-hour sunlight make it possible to grow even tomatoes in the outdoors. Oats, barley and many perenial grasses provide a variety of fodder for dairy stock.

Each foraging cow produces 3570 kilograms of milk.

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Communist Economic and Military Aid

Activities in the Less Developed Countries

December 1966

PART I - Economic Aid

General

Western Aid to the Less Developed Countries

1. According to statistics supplied by the Organization for Economic Cooperation and Development (OECD) the member countries of the OECD Development Assistance Committee (DAC)* provided an outflow of $10.15 billion to the less developed countries in 1965 compared with $9.8 billion the preceding year. The less developed countries rely on DAC countries for about 90 per cent of their external financing requirements. Private investors supplied 38 per cent of these funds in 1965 and official or government sources provided the rest in the form of grants and loans, distributed bilaterally and through international institutions such as the European Investment Bank and the World Bank. The US supplied more than half of all funds followed by France with 13 per cent, the United Kingdom with 9 per cent and West Germany with 7 per cent. (UNCLASSIFIED)

DAC Capital Flow to the Less Developed Countries in 1965 (Mill. US$)

Country	Government	Private	Total
Belgium	121.0	119.5	240.5
France	756.7	561.9	1,318.6
W.Germany	427.1	278.2	705.3
Italy	65.9	183.8	249.7
Netherlands	60.0	164.3	224.3
EEC Total	1,430.7	3,869.5	2,738.4
UK	479.8	443.3	923.1
US	2,766.0	1,747.8	5,513.8
Other	604.0	370.7	974.7
Total DAC*	6,280.5	3,869.5	10,150.0

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Soviet Trade with the Less Developed Countries

2. In a report to a Party Congress, Prime Minister Kosygin reaffirmed the Soviet Union's interest in economic relations with the less developed countries and his statement on the future of Soviet trade with these countries implied a continued moderate growth in trade over the next five years but no great change in the pattern of Soviet trade with the less developed countries. The volume of Soviet non-military exports to the less developed areas is largely related to Soviet deliveries under the economic aid programmes and these deliveries have been relatively stable in recent years. In his report, Kosygin also stated that there would be a considerable increase in the volume of Soviet deliveries of complete plants and equipment, most of which is purchased under long-term credits. Kosygin also indicated that the exports of spare parts and other materials should also grow along with the increased deliveries of machinery and equipment. In the past the rate of machinery and equipment exports has greatly exceeded that of any category of Soviet exports. (CONFIDENTIAL)

3. Soviet imports from the less developed countries are also expected to show a moderate growth and Kosygin specifically mentioned increased purchases of many traditional Soviet imports from these countries such as wool, cotton, hides, foodstuffs and non-ferrous metals. Soviet imports will increasingly reflect repayments in goods by the less developed countries. These repayments may rise as high as $300-$400 million by 1970. (SECRET)

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