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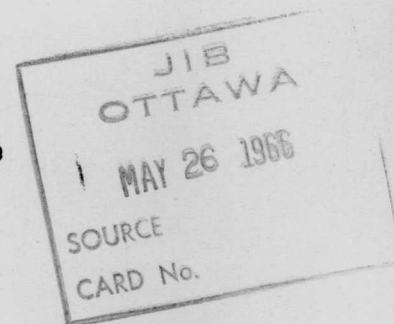
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GLOSSARY

ASSR	Autonomous Soviet Socialist Republic
CPSU	Communist Party of the Soviet Union
Kolkhoz	Collective Farm (Enterprise)
Kray	Administrative Region
Oblast'	Administrative Region
Rayon	Administrative Territorial Subdivision
RSFSR	Russian Soviet Federated Socialist Republic



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KAMCHATSKAYA OBLAST'

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Supplement 1

AGRICULTURE & FISHERIES

Drift Station in the White Sea

Soviet biologists have established a scientific station on a drifting ice floe in the White Sea in order to study the habits of the Greenland seals. The call sign of the station is UY-3.

Two helicopters delivered the six man team to its destination.

Expedition Chief	-	L.A. Popov
Scientists	-	Yu. I. Nazarenko and M. Ya. Yakovenko
Technicians	-	L. Kovnat, L. Sennikov and V. Kuroptev

Izvestiya  
12 March 1966  
Page 4 (Abridged)



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ANTARCTIC

Fuel Supplies for the Antarctic

The tanker Fridrikh Engel's delivered diesel fuel and aviation gasoline from the Black Sea area to station Molodezhnaya in the Alasheyev Bay and to the Mirnyy Observatory. The oil products were pumped directly from the tanker into metal tanks that have been built in the vicinity of the above locations.

Vodnyy Transport

24 March 1966

Page 1 (Slightly abridged).

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## ARCTIC

### The Arctic Dictates

The question has been asked why the Arctic fleet has been reduced to the state of a unique work-correction colony "Forge of Crews". Firstly, work in the Arctic requires that a man be fed on a higher ration than under normal climatic conditions, whereas, in actual fact, more money is spent on the diet for those crossing the Equator than for those going beyond the Arctic circle. The best answer obtained to this question was that it has been so directed from above. Secondly, although the crews on icebreakers are under an almost continuous physical and nervous strain, in the material sense they are worse off than other sailors. Thirdly, the Arctic sailors practically never see summer. They depart in early spring and return in late fall. However, they hardly ever get fresh vegetables and even more rarely do they get fresh fruit.

A few years ago there were thirty six pilots with specialized Arctic training, whereas now there are only five. There is a very large turn-over of crews. Last year, the icebreaker "Moskva" had 80% of the supervisory staff in its engine-room crew replaced, as well as 30% of the deck crew. The same situation is the same on other ships.

The comparatively mild conditions in the Arctic during the past few years has resulted in complacency among personnel of the Far East Steamer Agency. This has resulted in a certain amount of carelessness in the selection of both crews and ships for the Arctic convoys. Suffice it to say that about 70% of the total number of ships sailing in the Arctic this year suffered some amount of damage.

It is felt that three main problems must be solved in the future: increase the material incentives to sailors sailing regularly in the Arctic, increase the size of the Arctic fleet and decisively review the state of shipping in the basin.

Vodnyy Transport  
23 December 1965  
Page 2 (Summary)

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## CONSTRUCTION

### New Building Material in the Arctic

Island Dikson, 28 February. Construction workers of the Diksonstroy trust have started work on two multi-storey buildings. These are not being built of brick which has to be flown in from the mainland but, of arbolite, a local material. The latter is suitable for building various facilities for Kolkhozes and Sovkhozes.

Izvestiya  
1 March 1966  
Page 5 (Abridged)

### Heat Radiating Panels

The Arctic settlement Provideniya is acquiring the appearance of a town. Soon new buildings will appear which will have an unusual heating system. The first such building has been started. This sixty apartment bloc will be heated from the usual central distributing point. The heat will be channelled into a radiator which in turn will force hot air through special ducts in walls and floors. Thus the hollow floor panels will serve to radiate heat throughout the building.

Sovetskaya Rossiya  
2 March 1966  
Page 2 (Abridged)

### Pre-fabricated Houses for Northern Oil Areas

Oil producing areas of the north are being rapidly developed. New houses are built in Megion, Surgut and Nefteyugansk.

The personnel of the Moryakovskaya repair and operations base have despatched the various components of 87 pre-fabricated buildings of 8 apartments each. An additional 15 such buildings will be sent in 1966.

Vodnyy Transport  
17 March 1966  
Page 4 (Full text)

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Experimental Dwelling for the North

A new three room house for northern regions has been developed by the Krasnoyarsk Promstroyproyekt Institute. The house is made of plywood with foam plastic insulation. The house has modern in-built lockers, coolers etc., and the temperature may be regulated individually, in every room.

Izvestiya  
22 March 1966  
Page 6 (Abridged)



## ECONOMIC DEVELOPMENT

### The Natural Resources of Siberia should be developed more rapidly

It is believed that the Western Siberian Lowland has the world's greatest concentration of oil and gas. It is anticipated that in the future an unlimited amount of gas and oil will be extracted from this region.

The largest fields discovered are in the Tyumen' Oblast'. The Tomsk field is next in size and prospecting is continuing in the Krasnoyarsk Kray and in the Omsk Oblast'.

The size of the reserves is indicated by the fact that a number of oil and gas regions now in operation are comparable to or greater in size than the oil fields of Bashkir, Northern Caucasus and other fields.

Ten large oil and gas fields are known in the Western Siberian Lowland at this time, of these eight are in the Tyumen' Oblast'. Further discovery of six or seven regions is anticipated for the future and these are expected to be of the Oblast'. At the present time communications with the oil fields are very poorly organized or non-existent and opinions are being expressed to the effect that the situation must be rectified. It is recommended that each oil field be connected with the industrial centers of Western Siberia and European USSR by railroad, oil and gas pipelines, air routes and water routes. Large scale urban and industrial development is recommended for the region. Very large-scale drainage and flood control program for the Ob' river watershed is recommended.

In answer to critics who say that this program will take many score years and be extremely costly to the country, it is pointed out that in 1953, the first gas well was brought in at Berezhova, and seven years later the first one was brought in at Shaim. Paradoxically the per-meter costs for deep drilling and cost per ton of fuel produced has proven to be lower than for the RSFSR as a whole. Estimates show that the cost per ton of Tyumen' oil, including the costs due to the difficult natural conditions and the lack of ready bases for operations and raw materials, will not be any more expensive than the average for the country. After roads have been run through and the area is drained, the cost of oil will become very low.

Naturally, additional artificial obstacles should not be created. The construction of the dam at Salekhard is of doubtful value. Instead of draining, it will inundate entire oil and gas regions. The builders of roads, oil and gas pipelines and towns must even now take into account the boundaries of the future Ob water reservoir. The problem of development of the Tyumen' oil and gas fields is being studied by more than forty scientific-research and design institutes. Most of these institutes are situated in such cities as Leningrad, Moscow and Kiev. Oddly enough, only two of

/them are

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them are situated in the Tyumen' itself. Besides, the efforts of these institutes are not coordinated by any central organization. It is felt that their work should be coordinated.

Sovetskaya Rossiya  
25 November 1965  
Page 2 (Summary)

#### Drillers Pace the Tundra

The Bol'shezemel'skaya Tundra is alive with drilling teams even in mid-winter. Forty two drilling teams are carrying on round-the clock search for coal deposits. The results of their work is measured in both meters of depth drilled and millions of tons of coal discovered. For example, the largest Pechora basin deposit at Vorgashorsk has shown 280 million tons. The deposit at the Northern end of the basin, in the vicinity of Dal'mer-Yu, has shown 20.5 million tons of coal. Prospecting for energy coal is continuing in the Seydensk and Inta fields.

Sovetskaya Rossiya  
12 December 1965  
Page 1 (Summarized)

#### A Marvel in the Arctic

Six years ago a geodesist drove in the first stake at the foot of the Khibiny Mountains. He envisaged the day when a great ore-dressing plant would be erected on that spot, and the inaccessible Rasvumchorr Plateau would yield up its riches. Today, a first class ore-dressing complex stands on that spot, and it already produces a flood of concentrate required by the national economy. By the end of 1970 the apatite-nepheline dressing plant No. 2 belonging to the "Apatit" Combine named after S.M. Kirov will provide 3/4 of all the country's requirements in new material for production of phosphor fertilizers.

Stroitel'naya Gazeta  
26 December 1965  
Page 1 (Summarized)

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### Tyumen': Development Problems

The estimated reserves of oil in the Tyumen' Oblast' make up a significant part of the Nation's reserve. Twenty-seven oil and twenty-five gas fields have been discovered here. The explored reserves indicate that gas and oil can be taken from this area in greater quantities than from all the other oil fields in the country put together.

The natural gas fields are situated in the Northern part of the Oblast', in the Kondinsk, Berezovsk, Tazovsk, Purovsk, and Yamal'sk rayons. The gas horizons are situated at a comparatively shallow depth and the output of wells amounts to 25 million cubic meters per day.

More than a million tons of oil has been despatched to the oil refineries of the country. The 426 kilometer oil pipeline from Shaim to Tyumen' has been completed. The natural conditions in this area make work very difficult. Specific capital investments are comparatively low in this area because of the rich resources. The cost of one meter of exploratory drill-hole in Tyumen' is 20 rubles less than the average for the Soviet Union. It is worth noting that the distances for delivery of gas from the Northern regions of the Oblast' to the Urals, the Central and North-western regions of the country, are a thousand kilometers shorter than from Central Asia.

In addition, other branches of the economy have scope for development. The process of drilling for oil has uncovered many mineral riches, including seven coal fields. The forestry industry can be expanded from the approximately 8 million cubic meters yearly output to 50,000 million cubic meters per year. In addition, the entire harvest of timber could be processed locally. The Tyumen' is a great supplier of the country's fish products and there is room for expansion in this branch of the economy. Increased scale of railroad and highway construction and additional capital investment in this utility could be justified only by additional industrial development. The construction of well-built and permanent workers' settlements would also encourage industry. Docking facilities on all the rivers joining oil fields and gas fields will be rebuilt or expanded or new ones put in. At Ura and Surgut, each organization is building its own oil storage facilities.

Izvestiya  
30 December 1965  
Page 2 (Summary)

## Soviet Oil

"The oil workers of the Soviet Union fulfilled the seven-year oil extraction programme ahead of schedule in the second half of November. During the period, from 1959 to 1965, they gave the country more than 1,300 million tons of liquid fuel. This is an average of 186 million tons a year.

What has been introduced in the oil extraction industry in the past seven years, and how will it develop in the next five year? These questions put by Novosti Press Agency (APN) correspondent Nikolai Pantelyeve were answered by Valentin Shashin, Minister of the Oil Extraction Industry of the USSR.

The oil extraction industry appeared in Russia a little over one hundred years ago. In half a century the annual oil output was ten million tons, and during the next fifty years it was brought up to 243 million. It increased during the last seven years by 130 million tons, i.e. more than doubled. Nearly as much oil was extracted in the USSR in the present seven-year period as during the previous 100 years (1,369 million tons).

What called forth such a rapid development in the oil industry? In the first place, a wide scope of geological-prospecting work. Baku, the capital of Azerbaijan, was the country's chief oil centre for many decades. Until quite recently it produced approximately 80 per cent of the country's oil output. At the end of the thirties a new powerful oil base appeared between the Volga and the Urals. But the war against Hitlerite Germany slowed down its development. The exploitation of the large oil deposits discovered in the eastern part of the country, including the Tatar and Bashkir Autonomous Soviet Republics, Kuibyshev, Orenburg and Perm regions, actually began after the war. Today the Volga-Ural basin, which the Soviet people call "Second Baku," already produces 72 percent of all the oil extracted in the country.

The geography of the exploited liquid fuel deposits expands from year to year. Great quantities of oil are now being extracted in the Far East, in Kazakhstan, in the republics of Central Asia, in the very cold Pechora territory--the Komi Autonomous Republic, and in the Ukraine. Oil was discovered in Byelorussia recently.

The Soviet geologists' universally recognized success is the opening of oil and gas deposits, (unique for their reserves) in the West Siberian lowlands and in the north of Novosibirsk Region. The West Siberian lowlands became the country's new big oil and gas fields.

More than 350 oil deposits were opened during the past seven years in the USSR in new districts, and hundreds in previously prospected areas.



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The Soviet Union has the world's biggest potential resources of mineral fuel, including liquid, which is more effective, and cheaper than coal. The oil and gas bearing areas and promising regions of sedimentary deposits, which usually contain oil and gas, amount to millions of square kilometres, which is several times more than in the USA. The Soviet oil extraction industry today is developing incomparably faster than the American. In oil output the USSR occupies second place in the world. In the future the prospecting and exploitation of new oil and gas regions will develop on a greater scale.

A policy for priority development of oil and gas is being carried out in the USSR, and they are being used as raw material for chemical production on a growing scale.

A wide application of the latest achievements in science and engineering played an important role in the growth of oil extraction. New methods of prospecting are being used: seismic surveying, electro- and radio-metric, gravimetric, magnetometric, and others. Important changes have taken place in boring. Improved machines and equipment, including turbo-drills and electrodrills, are used to accelerate drilling work. Mobile drill derricks are an invention.

The methods used in exploiting oil deposits have changed radically in recent years. This, in the first place, is the wide application of perimeter and contour floodings, which greatly increase the coefficient of the oil flow of the bed. The purpose of these methods is to artificially create an active water drive in the beds. This is done by injecting water into the bed through the wells in quantities necessary to maintain pressure at a high level, ensuring a natural flow of the wells. The water forces the oil out of the beds. The flooding of the beds decreases the number of wells five to ten times, and consequently the volume of drilling cuts the cost of oil, economises means, equipment, and pipes.

The further growth in oil extraction, just as in gas, is impossible without expanding the volume and increasing the speed of drilling and raising drilling efficiency. Soviet scientists and designers have made reliable small bits, thus making it possible to simplify the design of the wells, to decrease the expenditure of materials and make drilling cheaper. Diamond bits were also made for drilling through the lower zones of deep wells. They helped to revive and increase oil extraction in such old regions as Baku, Daghestan, Grozny, and a number of others. Drillers working these regions have begun to exploit oil deposits adapted to the Mesozoic deposits, where the wells are up to 5,000 metres deep. Seven-kilometre wells are now being drilled in Baku and the Caspian region.

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Wide perspectives will open up before the oil workers in the forthcoming five-year period. It is planned in 1966 to bring oil output up to 21 million tons as compared with this year. This record increase alone will be more than double the total output of tsarist Russia for the whole of 1913.

In 1970 it is planned to extract 355 million tons of oil, and during the five year period more than 1,500 million tons. The increase in oil output will be an average of 22-23 million tons per year during the five years.

The Ministry of the Oil Extraction Industry of the USSR was established after the September Plenary Meeting of the CPSU Central Committee. Its most important task is a rapid development of oil output in West Siberia. Of the 32 oil deposits opened here, four have been prepared for exploitation: Tryokhozernoye, Megionsk, Ust-Balyk and West and North Surgut. Already this year they will produce a million tons of oil.

In 1961 the first powerful oil fountain gushed forth in West Kazakhstan on Mangyshlak Peninsula, which falls into the Caspian Sea. Several hundred million tons of oil have been prospected in the southern part of this peninsula, covered with scorching sands. This is a multibed deposit. They occur, like layer cake, at a depth of 1,400 to 3,500 metres. A test exploitation of the Uzen multibed deposit began on Mangyshlak in the second half of 1965, from which about half a million tons of oil have already been extracted. Industrial exploitation will start next year.

The new deposits will give the country in 1966-1970 approximately 80 per cent of the total increase of the oil output. Not less than 75 per cent of the oil will be extracted by the end of the five-year period with the help of perimeter and contour floodings.

The author of this article was  
Valentin Shashin, Minister of the  
Oil Extraction Industry of the USSR

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January 6, 1966

### The Northern "Magnitka"

Cherepovets today is a large modern city, with straight streets and boulevards and broad squares. It already has a population of 160,000. Old-timers hardly constitute 10 per cent, all the others being new settlers. Yet, Cherepovets is an ancient town. No wonder its coat of arms consisted of a bear, fishes and a river boat's steering wheel. In times gone by the local inhabitants engaged in hunting and fishing, and ships sailed from here along the Mariinsk water system. The latter has now been superseded by the Volga-Baltic Sea system.

Everything has changed in the city, and continues to change still.

This is because Cherepovets has become a big centre of the metallurgical industry.

Let us take a look at the map. Here is Leningrad, Vologda, Arkhangelsk, Petrozavodsk. They form a huge quadrangle, large enough to accommodate several European countries, constituting the North-Western industrial region of the USSR. Economically it is closely connected with the Baltic republics and Komi ASSR. Until quite recently this vast region had no metal industry of its own.

Even before the war a raw materials base was discovered for it, although at a rather considerable distance away. Large deposits of iron ore were found on the Kola Peninsula, with millions of tons at the Olenegorsk field alone. Fine coking coals of almost any grade were discovered in the Pechora Basin.

The question arose, where should the steel works be built? On the Kola Peninsula? But the Pechora coal is too far away. At Pechora? The ore is too far removed.

Technical and economic estimates drawn up by a group of scientists under the late Academician I.P. Bardin showed that the best place to build the steel plant was mid-ways between the ore and the coal. And Cherepovets proved to be a point lying just about midway between Pechora and Olenegorsk.

In those days it was feared by some that shipping costs would reduce to nought all the efforts of the future steel plant and that it would become a millstone on the country's neck. But this fear has been dispelled by the facts of life.

The first Cherepovets blast furnace was put into operation in August 1955, and the next a year later. Then the open hearth "cigars" began to belch smoke. The best craftsmen of the "fiery" trade came to work at the Cherepovets plant.

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The three most experienced schools of Soviet metallurgists--those of the Kuzbas, the Urals and the Ukraine--pooled their know-how at Cherepovets. Taking over from one another everything that was best and most up-to-date, they carried out a veritable technical revolution in metal production. They used high pressure gas, hot blast, fluxed agglomerate and natural gas and oxygen in the blast furnaces, automatic heat control together with natural gas in steel smelting, and high speed methods in rolling.

But much as they had achieved, production costs remained high. All the technical and economic indices had to be sharply improved. The works officials insisted on a revision of the project, with a more than three-fold increase of the volume of output.

This was an ambitious scheme, but it rested on a sound foundation. And this was the general direction adopted in the expansion of the north-western steel centre, the Northern Magnitka, as it has come to be popularly known.

Time has shown that the people of Cherepovets are not in the habit of wasting their breath. Within a few years of launching the first units of the works they not only reached the production standards of the foremost steel plants of the country, but in some ways even exceeded them.

The Cherepovets blast furnace operators are already ahead of those of Magnitogorsk and Kuznetsk. They have steadily improved the volumetric efficiency of the furnaces--from 0.500 two years ago to 0.480 last year. The furnace run by A. Gutorov has lately been operating with an efficiency of 0.458, bettering the average efficiency for the country by more than a third.

No other blast furnace in the world can boast of such a high coefficient of efficiency. The last, and very powerful, blast furnace launched in 1963, has been exceeding its plan from the very first months of operation.

The blast furnace operators have been constantly intensifying the technological process. K. Tsimbalov, who works on the third furnace, made a very interesting test. He enriched the blast air by almost a third of oxygen and experimented with it for a week and a half. As a result the output of the furnace jumped by 600, sometimes even 800, tons a day. The test proved successful and has been applied at one more furnace, again with full success.

Works chief engineer V. Vanchikov has estimated that application of this method at most of the blast furnaces will give the country several million tons of extra iron and coke a year.

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The coke chemists too are working well, improving their efficiency standards and cutting production costs from year to year. The cost of a ton of coke last year was 21 rubles 11 kopeks, compared with 24 rubles at the beginning of the seven-year plan. The cost of the chemical products too has been going down.

The steel smelters were less "lucky" for a long time. Although new open hearths were put into operation each year and the basic production assets grew, the technical and economic showing remained the same, even going down at times.

What did the steelmakers do then? They began to use a better filler--fluospar--and devised means of saving ferromanganese and other expensive materials. They also changed their work methods. In the past, for instance, each smelting was watched by the engineer on duty or the section chief. At present the team leader is directly responsible for the job, giving the engineers and section chiefs more time to attend to other matters. The Cherepovets steelmen have shown themselves to be excellent technicians and to have a good understanding of production economics.

When the results were summed up they surprised not only their mates but even the veterans of Kuznetsk and Magnitogorsk. Many of the teams began to produce as much as 9.64 or even 10.24 tons of steel per square metre of furnace floor.

Last year they made a still better showing, producing 11.01 tons per sq. m. of furnace floor, and even as much as 11.5 tons in the last quarter of the year. This was the best showing made by any open hearth furnace in the country operating without oxygen!

Cherepovets has one of the largest rolling mills in the country. The designed capacities have been achieved by sheet-rolling mill "2800-1700," the light-section mill "250" and the cold-rolling mill, the pride of Cherepovets. The blooming mill last year exceeded its designed capacity by 200,000 tons, thereby beating the Kuznetsk blooming mill, which had up to then ranked first in the country.

The blooming mill is now undergoing certain readjustments, following which its yearly output is expected to grow by several hundred thousand tons.

Among the major tasks facing the Cherepovets steel works is a reduction of the raw and other materials used per unit of output, all of which travel long distances before reaching the works, and this is being successfully accomplished. The blast furnace men, for instance, have reduced the amount of coke used to produce a ton of iron to 453 kilogrammes; the same has been done by the steel smelters with regard to the charge, and by the rolling mill operators in respect to the amount of metal used to produce a ton of rolled steel. This resulted in an economy of more than eight million rubles in 1965 in the rolling mills alone.

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The introduction of technically sound quotas has yielded good results. Shop staffs have been reduced by 800 men, who have been given other employment. Railway shipping costs have been cut by nearly three rubles per 1,000 tons.

Thus gradually, step by step, by improving their technologies, reducing production costs, economising on materials and rationalizing traffic, the Cherepovets steel works first approached the point of profitability and then moved beyond it.

Production costs have been cut by an average of six per cent a year.

As a result, the works began to operate at a profit. Small at first, limited to some tens of thousands of rubles, the profit grew to hundreds of thousands, and in 1964 reached 20 million rubles, with a further gain recorded last year. The total profit made by the Cherepovets works under the seven-year plan was 72 million rubles.

"Already last year we fully returned the state subsidies received by us during 1951-61," works director Anatoly Borodulin told us.

He came to work at Cherepovets at the beginning of 1962. Extensive experience at the Kuznetsk steel works helped him to get his bearings in the new circumstances.

There is every reason to believe that the tasks set before the Cherepovets steelworks under the new five-year plan will be successfully fulfilled. This belief is reinforced by the steady improvement of the economic showing made by the plant. Over the past seven years productivity has been pushed up by 41 per cent. Last year the output per worker in the blast furnace department was more than seven tons, and in the open hearth furnace department three and a half tons.

In the future productivity should grow even faster, and there are good reasons for it. The latest and most up-to-date technological processes are being introduced at the plant. Last December an experimental double-bath hearth furnace was launched, and it has functioned with a high degree of efficiency ever since, producing far better results than the old type of open hearth furnaces. For the first time in the country, a commercial dry coke slaking installation has been tested here. A totally new tap-sealing method has been introduced, and the design of some of the elements of the larger type of open hearth furnaces, as well as the blast heater jets and burners, has been improved.

The "Northern Magnitka" management devotes much attention to mastering new lines of output. In 1963-64, for instance, production of steel for large-bore gas pipelines was started. The new steel recipe was worked out at the plant. Manufacture of stainless steel is being mastered. Cold-rolled sheet metal made from it will be used to build automobiles. Extra-durable section steel and several other novel products have begun to be manufactured.

The Cherepovets works gets concentrates from ores containing elements which give the iron produced some very valuable properties. The steel made from it is also of excellent quality. No wonder Cherepovets metal is in big demand both at home and abroad. Last year losses from spoilage were reduced to 0.38 per cent, the lowest in the country.

The steel producers strive to improve their skill and understanding of the economics of their trade. More than 4,500 workers of the plant attend evening and correspondence schools and colleges and schools for young workers. As a result, almost half the plant employees have a secondary or college education.

And everybody was overjoyed, of course, at the news that the Cherepovets works had been awarded the Order of Lenin. This brought home to them the wonderful changes their immense plant has gone through since its early days when it was only learning to stand on its own feet. Today it favourably compares even with some of the most advanced steel plants of the country. The Kuznetsk and Nizhni-Tagil works are already behind it in rolled steel output. These advances have been accomplished in the main under the seven-year plan, when the output of iron increased 2.7 times and of steel 4.9 times.

The Cherepovets steel workers have decided to turn out, during the first year of the five-year plan, 25,000 tons of iron, 30,000 tons of steel and 25,000 tons of rolled metal above plan, and to launch a number of new mills--mill "1150," medium section mill "350", wire mill "280", the first section of an iron wire department, and a dry coke slaking installation--reaching capacity output by the end of the year.

The labours of men standing at the sources of the fiery rivers thus create mighty streams of iron.

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Ekonomicheskaya Gazeta  
No. 7, February 1966  
(Abridged)

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### Tebuk is Expanding

The West Tebuk oil deposit in the Komi ASSR was discovered during the period of the Seven Year Plan. The development of new areas progressed at a rapid pace. At present oil is carried over a 70 kilometer pipeline to be refined in Ukhta.

The Settlement Nizhniy Odes with its numerous multi-storey buildings is located in the vicinity of the oil deposits.

Ekonomicheskaya Gazeta  
No. 10, March 1966  
Page 33 (Abridged)

### The Mica Mine Lugokva

The settlement Mama is located at the junction point of two Siberian rivers, the Vitim and the Mama. This is the site of a mica mine which was first discovered some 275 years ago. A photograph shows the sector Otkrytyy of the Lugokva mine.

Sovetskaya Rossiya  
15 March 1966  
Page 1 (Abridged)

### How to Create an Industrial Centre

#### On the All-Round Development of the West Siberian Economy

The extensive bowl of the Ob River basin and its tributaries, covering thousands of square kilometres, is one of those regions of the Russian Federation which offer the brightest prospects of development. It occupies a key position in the solution of the tasks set by the Draft Directives of the 23rd Party Congress on the next five-year plan. Why is this so?

West Siberia is one of the most highly developed economic region on the other side of the Urals. It accounts for about half the population of the eastern regions. Over the past quarter of a century the industrial output of West Siberia has increased 13-fold, almost twice the average for the RSFSR as a whole. This was fully in keeping with the effective distribution of the productive forces in the country.



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The natural and economic conditions of the region are such as to give priority development to the coal, metallurgical, engineering and chemical industries and grain production, as specialized branches of industry. Many facts bespeak the high efficiency of these industries. The cost of production of a ton of Kuzbas coal, a tons of Kuznetsk steel or a ton of Kemerovo nitric acid is between 30 and 35 per cent lower than the average for the USSR.

More recently the leading industries determining the specialization of the entire region have been joined by another industry which may be destined to assume, perhaps, first place among them, namely, the oil and gas industry.

Various auxiliary industries too have been created in West Siberia. Some of them cater for the needs of the basic industries, others supply the population with consumer goods. They are necessary for the all-round development of the national economy, one of the principal conditions of proper territorial organization of production.

What are the tasks facing the West Siberian economy in this sphere?

The leading industries of the region supply the needs of customers most of whom are to be found outside its boundaries. The "internal" demands of West Siberia are met by them in a small degree only. This kind of "export-import" operations involves the cross-hauling of many types of products and unnecessary transport expenses.

This is most glaringly seen in the case of engineering products. More than 80 per cent of the West Siberian engineering output is sold outside the region, while more than 70 per cent of its own demand for machines and equipment is supplied by other parts of the country. Its basic exchanges are with the Urals and the regions lying further west.

The conclusion naturally suggests itself that it is necessary to change the specialization of some of the West Siberian industries so as to satisfy local demand and the demand of the other eastern regions of the Russian Federation. It is already possible now partly to revise the output of the local engineering plants with capacity reserves. There is good reason that the Kuznetsk Steel Works meet more the demands of the East; even the commissioning in the current five-year plan period of the first section of the West Siberian Steel Works, while improving the supply of rolled metal to the Asian part of the country, will not put an end to the unjustified cross-hauling of this product. New factories too should be built to meet, in the main, the needs of the eastern parts of the Federation.

Perfection of West Siberian specialization depends entirely on the further development of the local fuel and power industries. In the first place preparations should be made for the extensive development of the Itat coal fields.

The development of the oil and gas resources of the West Siberian lowland poses the urgent problem of expanding the petrochemical and of setting up a gas-chemical industry in the region. Even capacity operation of the Omsk petrochemical combine will mark only the beginning of this work. New chemical plants will have to be built along the routes of the future oil and gas pipelines running along the Ob River.

Nor should we forget the need of developing the auxiliary industries in West Siberia--electric power, building materials, timber, light and food industries, and suburban farming. Their present level is far behind the needs of the region or the local natural and manpower potential.

The percentage of able-bodied people not employed in social production is about 50 per cent higher in West Siberia than in the RSFSR as a whole. Most of them are women. Yet there is a chronic shortage of manpower at the local factories and construction sites and the local labour resources are constantly being replenished by an influx from outside. Most of the labour reserves are concentrated in the centres of heavy industry, where the opportunities for female employment are limited, and in the small and medium-sized towns.

It is there that auxiliary industries should be set up, other economic factors (proximity of raw materials, fuel, transport facilities, water, etc.) being taken into consideration, of course. In the Kuzbas, for instance, the light industry should be developed on the basis of local chemical materials and Central Asian cotton, as well as the engineering, chemical and building materials industries.

The Draft Directives of the 23rd Party Congress say that "in order to provide favourable living and working conditions for the people and to establish permanent contingents of workers in the eastern and northern areas, housing and communal and public buildings shall be erected at rates higher than those obtaining on the average for the country." This fully applies to West Siberia, where the auxiliary industries are not yet sufficiently developed and do not meet the demands of the population.

The building of the Central Siberian trunk railway creates favourable conditions for siting industrial projects at points of intersection between it and the Ob and Irtysh rivers, namely, Suzun, Kamen-na-Obi and Irtyshskoye. In future they may rival Novosibirsk and Omsk, whose industrial development has been largely due to their transport and geographical position as points of intersection between the Main Siberian trunk railway and the largest rivers of the region.

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For West Siberia to develop successfully, the various parts of the region should be themselves precisely specialized. It is intended to create here a large economic complex based upon the local oil, gas and timber resources. The creation of such a complex over a vast area with varying natural conditions requires a careful approach to the delineation of its borders. It seems expedient to us to single out within the Ob-Irtysh basin an extensive economic area consisting of the Tyumen, Tomsk, Omsk and, possible also, Kurgan regions.

Another large economic area should comprise the Kemerovo and Novosibirsk regions and the Altai Territory, the specialization of which ought to be determined by coal, steel, engineering, chemicals and grain. Such regioning should make for the most effective development of the productive forces of the Ob-Irtysh basin.

Not all the stages of this work can be completed during the current five-year plan period, of course. Much will have to be done later. But the foundations for it should be laid now, so as to make sure that this very rich region will be properly and effectively developed in the years to come.

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Sovetskaya Rossiya  
16 March 1966  
(Abridged)

#### Transportation of Oil in Western Siberia

Western Siberia extends from the Urals to the Yenisey and from the Arctic Ocean to the Steppes of Kazakhstan. This region which abounds in natural resources has been providing the country with timber, coal, peat, iron ore etc. Recently, gas and oil have been discovered in vast quantities. Today, this huge oil region is of major concern to geologists, construction workers, research scientists and.....river transport personnel.

The development of this region rich in oil and gas represents one of the major tasks of the new Five Year Plan. The aim is to establish an important economic complex on the territory of Western Siberia. The directive of the XXIII Party Congress relative to the new five year plan, prescribes an increase in the output of oil and gas to reach 20/25 million tons and 16/26 billion cubic meters respectively.

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The oil industry of Siberia has attracted thousands of people in various trades and professions, including river transport personnel. Convoys of vessels loaded with equipment and material ply the Ob' and Irtysh from early spring to late autumn. On return journeys these vessels carry oil from the new deposit areas. During the last shipping season, the amount of cargo in destination of the "Siberian Baku" has increased 1.5 times and 840,000 tons of oil have been shipped out.

Due to the cooperation of vessel crews and port workers, the Ob' and Irtysh shipping agencies were able to transport 1140,000 tons of oil in excess of the plan.

Although the results achieved today cannot be ignored, the Ob' and Irtysh shipping agencies have to improve their services in the forthcoming five year period. Nearly 1.5 million tons of oil will have to be moved in the first year. The shipments of supplies to oil producing areas will have to be doubled. Both shipping agencies have the capability to bring about the required improvements in this respect.

The last shipping season has shown that the problem of vessels having to stand idle while waiting for loading/unloading, has not been solved. Oil carriers of the Ob' and Irtysh shipping agencies have wasted thousands of ton/hours in idle waiting time at anchor, through poor wharf facilities and excessively long overhauls.

The main administration of the 'Tyumen' oil and gas industry (Glavtyumen'neftegaz) has failed to provide adequate wharf facilities at Pimskaya and Belyy Yar for the start of the shipping season. This resulted in an accumulation at the end of May of dozens of barges and tugs in the middle reaches of the Ob'.

Vessels of the 'Tyumen' shipping agency alone lost about 300,000 ton/days through delays in loading. Most of these losses occurred at Pimskaya, Ust'-Balyk and Bogras.

Delays also occurred through frequent breakdowns of pumping equipment, which was inadequate even when in perfect order. In Megion, for instance, the pumps were supposed to have a capacity of 300 tons per hour whereas in fact they were able to average only 246 tons. Thus there was a daily shortage of 1300 tons of oil.

In many cases, the river transport personnel was at fault. During the busy season, the Irtysh shipping agency was never capable of supplying a sufficient number of oil carriers as prescribed by the plan. In the quest for a large number of ton-kilometers, arbitrary changes were made to shipping schedules. As a result vessels jammed certain wharves while others were empty. This disorganized river traffic had an adverse effect on operations at the oil production sites.

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Award to the Ukhta Combine

Decree of the Praesidium of the Supreme Soviet USSR.

Award of the Order Labour Red Banner to the Ukhta Combine of the Ministry of the oil Industry USSR.

This order was awarded to the combine for completing the seven year plan ahead of schedule and for the success achieved in developing new oil deposits in the harsh conditions of the North.

The decree was signed by N. Podgorny and M. Georgadze and dated 16 March 1966.

Izvestiya  
18 March 1966  
Page 1 (Full text)

Oil From Siberia

Oilmen of the Tyumen' Oblast' have overfulfilled the plan by 15,000 tons since 1 January 1966.

The oil is carried by pipeline from Shaim to Tyumen'.

Gudok  
18 March 1966  
Page 1 (Extracts)

Development Projects in the Tyumen' Oblast'

The Tyumen' Oblast is one of the largest and richest oil and gas regions of the country. Oil and gas producing centres have been established in a relatively short time at various remote points in the taiga. These centres are located in areas with a harsh climate and far removed from railway transportation. Over 50,000 people of various trades and professions related to the gas/oil industry are employed throughout the oblast'.

Todate, the Tyumen' Oblast' has yielded over one million tons of oil. Oil started flowing through the pipeline Shaim-Tyumen' and the gasline Igrim-Serov carries natural gas to the Urals. Construction work is nearing completion on the railway lines Ivdel'-Ob' and Tavda-Sotnik. Work has been started on the rail link between Tyumen' and Surgut, the centre of the near-Ob' (Priobskiy) oil area. Work is in progress on the oil pipeline Ust'-Balyk-Omsk.

All this is but the beginning of a large scale project to develop the incalculable resources of this vast territory.

The draft resolution of the XXIII party Congress foresees the establishment of a major industrial complex in Western Siberia which will be based on oil, gas and timber resources. It is planned to increase oil and gas production so that it would reach 20/25 million tons and 16/26 billion cubic metres respectively by the end of the five year plan period. Construction of railway lines and pipelines must be completed. Modern towns and settlements, airfields and river ports will be built in the vicinity of the new deposit areas. The oblast' will be criss-crossed by highways and power transmission lines.

The work involved in this project is of unprecedented magnitude. This may be seen from the capital investments involved and which will total over 4 billion roubles over 5 years.

Many problems will have to be solved prior to the start of this large scale construction project. Some of these are discussed below.

Building materials and pre-fabricated components for new projects at oil producing sites are shipped in large quantities from areas in the Soviet Union which are thousands of kilometres away. This material is off-loaded in Tyumen' and Omsk, transported to river ports for the onward journey north by barge. As the rivers are navigable for a period of four months only, air and land transport have to be used to haul this material during the remaining months of the year.

The transportation costs exceed by far the value of the material carried. It has been estimated that the cost of 100 bricks reaches 89 roubles, not counting the losses that occur during transportation. One cubic metre of a sand/gravel mixture amounts to 12-15 roubles. The same applies to all other materials. The amount of new

/construction

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construction contemplated for the current year and subsequently is on a scale that renders it impractical to rely on "imported" materials exclusively. Therefore, it is imperative to establish highly productive facilities for the local production of building materials.

In Surgut alone the following projects will be undertaken during the five year plan:

- (a) Plants to manufacture building materials with the following yearly output:
  - (i) Blocs.....140,000 cubic metres
  - (ii) Ferro-concrete components.....190,000 cubic metres
- (b) Factories to manufacture keramzit, keramzit-concrete panels, bricks, ceramic blocks, arbolite, agloporite and concrete as such.
- (c) Factories to manufacture electrical and plumbing supplies.
- (d) Sawmill and wood processing combine.
- (e) Repair shops and other auxiliary enterprises.

The construction of all these facilities will take several years yet their production is required now. There are two ways in which this problem may be solved. Firstly, construction could be started as soon as possible and maintained at a rapid pace. The other solution would be to establish temporary production facilities (pionernyye basy) with the understanding that these would become part of the final plant or factory. In other words, the construction should be phased.

In actual fact the Ministry of the Gas Industry USSR as yet has not considered the establishment of production facilities (basy). Funds allotted for the current year will barely suffice to cover the completion of temporary facilities, repair shops and concrete mixing premises. Permanent factories, plants are still in the "discussion stage".

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Let us consider the facts. In 1965 the Giprostroyaterialy Institute has produced technical and economic data for the development of a building materials industry in the Tyumen' Oblast'. The Ministries of the gas and oil industries have not considered these plans to this day. Consequently, of all available projects, only one has been approved. This concerns the construction of a factory for the production of arbolite goods. Although approval was given, no funds were allotted for its construction.

The ministry is not in a hurry to consider the plans for the construction of a major building materials combine in Surgut and, of bases in Chaim, Ust'-Balyk and Megion.

Time is pressing. All available data should be processed as a priority task and work should be started without delay at construction sites.

Even now local materials could be used. Yet, those in charge of construction are still being oriented towards "importing" the necessary materials from afar. Matters have reached a ludicrous stage. Sand and gravel deposits have been found in the area of Surgut but, the plan prescribes the shipment of these materials from.....Semipalatinsk! The distance from Surgut to Semipalatinsk is nearly 3,000 kilometres. The reason may be found in the fact that the Glavtyumen'neftegazstroy trust considers it unprofitable to work local quarries. The cost of locally produced sand and gravel will be three to four times less and this will have an adverse effect on planned costs!

The rapid development of natural resources calls for the establishment of a large production complex in the Oblast' centre - the city of Tyumen'. This could be easily achieved by enlarging existing enterprises. This in fact has been recommended in the Party Resolution.

The Ministry of Construction RSFSR and its central Urals administration, make grossly insufficient yearly allocations for such a programme. With the present financial allocations, the construction of an industrial complex will take at least twenty years.

We consider that the party resolutions should specify the establishment of the building materials bases as a priority project. This is of particular importance for the eastern parts of the country such as Tyumen' Oblast' with its harsh natural conditions. Enterprises for these areas should be planned to incorporate the maximum use of automation and mechanization which would greatly reduce the expenditure of labour. This is of prime importance as construction costs are three to four times higher in the north than in central areas of the country.



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Over seventy planning and scientific-research institutes in the USSR are working on problems related to the development of oil resources in the Tyumen Oblast<sup>1</sup>. Their work is unco-ordinated. As a result enterprises are sited haphazardly. Thus at a location which was selected for a geologists settlement in accordance with a general plan worked out by the planning bureau Geolstroyproyekt, the institute Bashnefteproyekt located a settlement for oil workers instead.

The following is another bureaucratic approach to a problem. The bank of a river in a oil producing area is used for the construction of wharves. In Surgut alone seventy-five such wharves are being planned. These will stretch over a distance of thirty kilometres. Each wharf will have to be provided with approach roads, storage premises and loading/unloading equipment. The answer is to build one large modern port.

Let us consider electric power. In Surgut there are fifty three small power stations; Nefteyugansk and Uray have thirty six each while Megion has twenty four. All these local power stations use "imported" fuel and require hundreds of people to service them. The power thus produced is excessively costly and the amount generated is insufficient to meet demands.

This problem requires an early solution. The Ministry of Electric Power and Electrification USSR should direct that construction be started on the power line Tyumen<sup>1</sup> - Surgut and the Surgut State Regional Power Station (GRES). The areas concerned should be provided with high output diesel power stations that could operate on crude oil.

A word about land transportation. Railway lines are being built but inter-regional and local roads are equally important. Planning and scientific research institutes are dealing with this question inadequately. Moreover the various organizations base their plans on roads that exist in the central parts of the country without taking into account the specific conditions that prevail in the north. The result is that a road built through a swampy area with stone and sand brought in from distant regions, becomes a very costly project. In fact one kilometre amounts to 700,000 roubles.

Finally there is a total lack of coordination in the development of transportation as a whole. An organization should be set-up in Tyumen<sup>1</sup> to coordinate the work of planning boards and scientific research institutes in respect of air, land and water transportation.

The author of this article was N. Pushkarev, manager of the construction department, Tyumen<sup>1</sup> Oblast committee CPSU.

Stroitel'naya Gazeta  
20 March 1966  
Page 2 (Full text)

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### Increasing Coal Production in the Komi ASSR

"New mines must be established and reserves accrued to reach 165 million tons of coal..." (Extract from the draft resolution of the XXIII party congress).

In order to comply with this revolution, members of the Pechorproyekt Institute have arrived in the Bol'shezemel'skaya Tundra where geological exploration parties have discovered large reserves of coking coal.

A photo shows the future site of a mine at Vorga-Shor in the Komi ASSR.

Gudok  
22 March 1966  
Page 3 (Extract)

### Development of Transportation in the Tyumen' Oblast'

The development of the "productive forces" in the areas of Siberia and the Far-East was considered as a major project in the Draft Resolutions of the XXIII Party Congress. Investments into the industry of the Tyumen' Oblast will be four times greater during the forthcoming five year period than the amounts allotted during the entire Seven Year Plan. It is planned to raise the output of oil and gas to 20-25 million tons and 16-26 billion cubic metres respectively by 1970.

The Draft Resolutions have set the following targets:

- (a) To increase the capacity of the oil pipeline Shaim-Tyumen'.
- (b) To complete the construction of the gasline Berezovo-Igrim-Serov-Nizhniy-Tagil
- (c) To complete the large diameter oil pipeline Ust'-Balyk-Omsk (now under construction).
- (d) To establish the upper Konda logging and woodworking complex.
- (e) To increase timber output to 11 million cubic metres.

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During the last few years transport facilities in the Tyumen' Oblast' have been developed at the following rates:

- (a) 13,000 kilometres of waterways.
- (b) 26,000 kilometres of air routes.
- (c) 10,000 kilometres of motor roads.

The major role in the development of the Tyumen Oblast' belongs to the railways. By 1970 the volume of loading and unloading along the Tyumen' lines will increase 2.5 times. A new marshalling station with a mechanized freight yard and railcar depot will be built in the area of Voynovka. The locomotive depot is being rebuilt.

The Tyumen' rail network is capable of servicing the southern part of the oblast' only. In order to develop other areas of the oblast', two railway lines are now under construction namely: Ivdel'-Ob' and Tavda-Sotnik. These two lines will be in operation sometime during the five year plan period. The railway line Tyumen'-Surgut (700 kilometres) will also be built. A decision has recently been taken to extend the Tavda-Sotnik line to Uray. Thus, out of the total of 7000 kilometres of new rail construction for the 5 year plan, 1000 kilometres of line will be built in the Tyumen' Oblast'.

Although the railway line Ivdel'-Ob' has been completed only to a distance of 341 kilometres, over two million cubic metres of timber have been transported in 1965. The Tavda-Sotnik line carries traffic to the logging settlement Kuma (98 kilometres).

Gudok  
24 March 1966  
Page 3 (Extracts)

#### New Mercury Deposit in the North

A tractor-sledge train has left Pevek for a 450 kilometre journey to the site of the new mercury deposit Plamennoye. The train consisted of 20 tractors towing huge sledges. The cargo included pre-fabricated houses, machinery, miscellaneous equipment etc.

Gudok  
25 March 1966  
Page 1 (Slightly abridged)

## PIPELINES

### Gas Trunk Pipelines

The Minister for Gas Industry of the USSR A.K. Kortunov answered a number of questions concerning the future of the gas industry in the USSR.

In response to a question concerning the rate of development in the gas industry in the USSR, the Minister answered that the rate is unequalled in the national economy. During the last Seven Year Plan, production of gas increased by nearly  $4\frac{1}{2}$  times, from 30 billion cubic meters in 1958 to 130 billion cubic meters in the current year. In the coming year, gas production will be increased by another 18 billion cubic meters and will amount to 148 billion cubic meters.

The pipeline building program for the current year is approximately 4,400 km of line. This includes a second pipeline between Bukhara and Ural (1,350 km), a gas pipeline between Smolensk, Roslavl<sup>1</sup> and Dorogobuzh (320 km), a 3731 km sector on the line Bukhara-Tashkent-Alma Ata, pipelines between Ostrogozhsk and Belousovo (236 km.), Belousovo and Leningrad (125 km), Krasnodarskiy Kray and Rostov-on-Don (third line, 146 km), Minnibaev and Izhevsk (213 km) and others. It is interesting to note that on the whole, during the Seven Year Plan, the savings from utilization of gas in the national economy amounted to 7 billion rubles. This is more than twice the amount of capital investment in the gas industry during the same period.

To the question of what tasks had been given to the builders of the gas industry, the Minister answered that by 1970, the last year of the new five year plan, it is anticipated that gas production will have risen to 240 billion cubic meters, that is nearly double the amount in comparison with 1965.

It would be worthwhile setting up new large gas industry centers in the regions of Western and Eastern Siberia and in Asiatic USSR. In the European part of the USSR, more than 60% of the increase in gas production is expected to come from deposits which have not yet been developed.

The Minister was then asked what was the anticipated increase in gas consumption, to which he replied that, at the present time, natural gas is used in about two thousand cities and large towns in the USSR. About eight million one hundred thousand homes are gas-heated. By 1970, this number will have increased to 23 and 25 million, including 5,600 thousand homes in rural areas. The total economy from gas utilization which will be realized by the population will exceed  $1\frac{1}{4}$  million rubles.

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The Minister was asked what new developments in science and technology would be applied to practical construction of gas trunk pipelines. His reply was that certain trunk pipelines from Central Asia and Western Siberia to the Urals would have their diameters increased to 1.220 and 1.420 m.m. In comparison with the present diameters of 1.020 m.m. this will correspond to an increase in carrying capacity of  $1\frac{1}{2}$  to  $2\frac{1}{2}$  times, and a saving in metal of 16 to 33% and in capital investments from 8 to 30%. In the near future, non-metallic pipes will be taken into use including asbestos cement, plastic and fibreglass.

To the question of how reorganization of the gas industry administration was progressing and how the Ministry would direct production under the new conditions, the Minister replied that now the Ministry would direct whole complex of matters associated with the development of the gas industry in the country, including its extraction, transportation and processing, as well as production of gas consuming machinery and the construction of oil and gas industry establishments.

When asked what were the future prospects for construction of oil pipelines, the Minister answered that such construction occupies an important place in the Ministry's program. Suffice it to say that in only the RSFSR it is planned to increase oil production by more than 17 million tons in 1966. Production on the Mangyshlak peninsula in the Western Khazakhstan will be increased by  $1\frac{1}{2}$  times. The Ministry has reviewed and confirmed plans for hastening construction of the new large oil pipeline from Ust'-Balyk to Omsk, covering a distance of more than 1,000 kilometers.

Stroitel'naya Gazeta  
29 December 1965  
Page 2 (Summary)

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## TIMBER AND FORESTRY

### Reflections on the Siberian Forests

Siberia's forests--whether of pine or cedar, of fir or white birch mixed with aspen--are magnificent creations of Nature.

I first realized the importance of forests at a lecture delivered by Viktor Danilevsky, gifted disciple of Professor Georgy Morozov, founder of the science of forestry. Some 50 years ago Professor Morozov declared that forestry as a science was a child of necessity. It arose with the demand for wood. Now man is wondering how to halt the catastrophic decline in timber resources.

Despite the measures some countries have taken, over the past thousand years the forest area has been reduced by half--by 2,000 million hectares, or even, according to some estimates, by 3,000 million hectares. In the next 50 years, economists calculate, wood consumption will nearly treble, while in 100 years it will be more than four times what it is today and will exceed the growth of cultivated forests by more than 100 per cent.

Therefore, science must not only restore what is being cut down but must sharply increase forest productivity, must improve the siting and distribution of woodlands from the geographical, soil protection, hydrological, economic and hygienic viewpoints.

This fully applies to Siberia, although 76 per cent of its territory is covered with forests. Already now the area of full-grown forests has noticeably diminished in many districts of Siberia, and in places there is even a shortage.

In many timbering areas the forest is being cut down at a faster rate than science recommends. At the same time, often less than half of the felled timber is utilized.

Where is the root of the evil? Evidently in the fact that the timbering organizations--large, complex industrial enterprises with specialized machinery and staffs of skilled workers and engineers--take from the cutting areas only those species of trees called for by the plan, leaving the rest, including firewood, in the forest or in their warehouses.

In this way the raw-materials base of the enterprise is squandered, so that instead of operating for 80 to 100 years the enterprise works for half, if not for one-third or one-quarter, of that time. The result is abandoned communities, roads and warehouses. The enterprises "move on" to a new place, where the same thing is repeated.

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What is the way out? The establishment of industrial complexes that utilize all the wood. Timbering should be combined with chemical and mechanical processing. This would make the enterprises several times more profitable and extend the time a given area is worked.

Wood chemistry is the real lever with which the entire forest economy can be changed, so that not only can each rouble of expenditure be recouped from tenfold to a hundredfold, but the entire timbering area can be utilized more economically, rationally and fully.

In his report to the Plenary Meeting of the Central Committee of the CPSU in September 1965 Comrade Kosygin spoke of the all-round utilization of natural resources. Let us analyze what the all-round, smoothly-functioning utilization of the forest and swamp-peat resources of Western Siberia would mean to our economy.

The forests of Western Siberia are unique in composition and variety, allowing for development of the most diverse industries. Scattered through the forests are large numbers of swamps containing an enormous amount of peat. So far they represent a "natural inconvenience" could be converted into an economically valuable source of organic raw material, on the basis of which important peat chemical enterprises could be established.

Prospected reserves of peat in Western Siberia run 90,000 to 100,000 million tons and would serve the economy for many decades, even centuries. When drained, the vast areas now covered by swamps could be used to grow grain, fodder and vegetables and for the cultivation of highly productive forests. After the swamps were drained, forest productivity would also increase considerably.

The share of wood and other forest raw materials subjected to chemical processing at timbering enterprises can be brought up to between 30 and 35 per cent. Today it is actually no more than one per cent (the average for the USSR is seven per cent).

#### Forest Towns and Highways

The favourable combination of raw-material resources and the extensive water network of the Ob' and the Irtysh, plus electric power from the Central Siberian grid makes it possible to establish big complexes in Western Siberia, especially in the sub-zones of the central and southern taiga, each capable of processing from five to six million cubic metres of wood annually.

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According to estimates, 43 timbering enterprises, united into five big complexes, could be built in Tyumen' Region alone. They could annually produce up to 25 million cubic metres of wood, five million cubic metres of saw-timber, three million tons of paper and cardboard, 500,000 cubic metres of plywood and a considerable quantity of slabs, furfural, protein-feeding yeast and products of wood chemistry.

About the same amount of products could be obtained after the construction of five or six big timbering complexes in Tomsk, Novosibirsk, Omsk and Kemerovo Regions and in the Altai Territory. Big industrial complexes such as the Asino in Tomsk Region and the Kuibyshev and Tasharin in Novosibirsk Region, are especially promising. Building could be started within the next few years since the main industrial sites are located near existing railways or railways now under construction.

In Tyumen' Region priority should perhaps be given to construction of the Verkhne-Kondinsk and Ivdel complexes, which would be situated near the new Ivdel-Ob railway.

Development of the timber industry and forestry in Western Siberia is retarded chiefly because of a lack of roads and the fact that the area is extremely swampy, with swamps covering from 50 to 60 per cent of the territory in some areas. Exploitation of the natural wealth of the taiga zone of Western Siberia would be greatly facilitated if road-building and industrial construction were carried out in combination with drainage schemes.

The specific nature of the geography of the forests and swamps calls for this. The tracts of forests are usually situated along the rivers and in the midst of swamps in "islands" or ridges that are often not very large. The swamps on the watershed plateaus and river terraces are usually from 10 to 30 metres higher than the level of the nearest river network. This makes it fairly easy to drain them.

Drainage would fundamentally improve climatic conditions, as well as the water, air and nutritional regimes of the soil. It would undoubtedly raise soil fertility, lead to a considerable increase in the productivity of the surrounding forest areas, and provide additional tracts of land for growing crops and raising livestock.

Draining the swamps would also permit railways to be built simultaneously, at a faster rate and cheaper cost, and on a greater scale. This is of great economic importance in exploiting and comprehensively developing the natural wealth there, especially the deposits of oil, gas and peat, and the forests.



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Construction of a railway network would also make it possible to mechanize the cutting and removal of timber and would help to improve the living and working conditions at timber enterprises.

Using the latest tractors, graders, bulldozers, excavators, ditchers and other machinery the industrial and agricultural enterprises that arise in the reclaimed areas would themselves be able to continue drainage operations and build additional roads.

This is one of the major ways of developing the swampy taiga in Western Siberia. The economic advantages of draining the land in Western Siberia are obvious, moreover. To drain one hectare of land in Moscow Region costs 100 roubles, but the first drainage operations in Novosibirsk and Tomsk Regions came to 25 roubles per hectare.

All this shows that drainage of the swampy areas in Western Siberia is becoming an important economic problem whose successful solution will make for more rapid and intensive development of the country's productive forces.

All-round utilization of timber and peat resources would make their chemical processing more profitable. Permanent and all-round utilization of all forest reserves, including wood waste, would increase the effective forest resources by 20 to 40 per cent.

Integration of the timber and peat industries with the extraction of oil, gas and iron ore at the Kolpashevo and Bakcharsky deposits would make it possible to plan and build large, modern towns with district heating systems, water-supply and sewerage, gas and electricity.

Land reclamation work would have to be started in several places at once if timbering is to be conducted simultaneously with the exploitation of gas and oil deposits in a number of districts. Drainage should be started first of all in districts bordering on the Ivdel-Ob railway line, and in the environs of Surgut, Tobolsk, Kolpashevo, Kuibyshev and Barabinsk.

To speed up construction of timbering enterprises and reduce output costs the annual volume of forest and swamp drainage should be increased annually by from roughly half a million to one million hectares. Modern machinery makes this fully possible.

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The establishment of permanent raw-materials bases requires that forest renewal should be carried out over a territory of up to 550,000 hectares annually, that new growths should be preserved on cutting areas of up to 200,000 hectares, and that new forests should be planted over an area of up to 100,000 hectares. The trees should be chiefly the fast-growing larches, pines, cedars, firs and poplars and they should be planted, first and foremost in the sub-zone of the southern taiga, where they will yield the greatest effect.

To do this and to develop a territory covering several tens of millions of hectares, further expansion of the railway network is essential, especially of the Mid-Siberian main line in the Tobolsk-Surgut-Yenisei direction, and the Ivdel-Ob line that is now under construction.

If all these technical and organizational principles are observed the output of all wood products will rise to ten times what it is today.

The transportation of wood and other cargo by water and also the draining of swamp areas will necessitate a bigger programme of deepening and straightening rivers and building through canals.

Priority should go to the construction of a 550-km. waterway incorporating the Ob-Yenisei canal, which will link up the Angara, Yenisei, Ob and Irtysh rivers.

Such a waterway would shorten the route of timber and wood from Central and Eastern Siberia to the Urals and Kazakhstan by 1,500 to 2,000 kilometres.

It is advisable to build this canal plus a drainage collector, simultaneously with the construction of a hydropower station on the Yenisei-Ob overfall. The canal will help to drain from two to three million hectares of swampland and enable the stripping and development of the Kolpashevo iron ore deposits, which lie at a depth of between 80 and 200 metres, to be started.

All this work will, of course, require large investments. But expenditures on the all-round development of timber and peat resources and chemical processing will be from 20 to 25 per cent less than on the building of timber enterprises alone. The economic effect in ten years' time will be 80,000 million roubles. If forest resources are developed only through timber cutting, without chemical processing or expansion of the thorough processing of wood and peat, the economic returns will be from three to five times less.

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### Mushrooms, Bilberries and Vitamins

The modern forestry or timbering organization should cut (and renew) not only trees. It should harvest and renew trees seed, forest fruits and berries, medicinal plants and mushrooms, catch game and fish, go in for bee-keeping, improve meadowland and drain swamps.

Let us once again consider the "small resources" of the forest. Without any significant additional outlays being made they could provide our population and economy with valuable food products and medicinal and technical raw materials, all of which could also be exported.

"We'll start with mushrooms. Pickled Siberian milk mushrooms were widely exported to Europe in the thirties through the "Kara Expedition" organization. Siberia has also long been famous for an abundance of the mushroom known as boletus edulis. An average of 100 kilograms of boletus can be harvested annually per hectare in a tract of bilberries. Western Siberia can annually produce more than one million tons of this valuable protein food. Some 900,000 tons of boletus mushrooms could be gathered in Eastern Siberia.

So far, however, the dried mushrooms sold at markets in Siberia come either from Moscow or from Byelorussia.

There was a time when the cooperative organizations in Siberia systematically purchased mushrooms, berries and nuts from the local population and contracted to supply them with food products, hunting equipment, etc. Today's rural cooperatives unfortunately do not show any particular desire to revive these fine traditions.

But they should.

Red bilberries are another food product found on a wide scale in the Siberian forests. There was an especially big crop in the forests of Tomsk and Tyumen regions in 1965. Altogether, up to 1,200,000 tons of red bilberries could be harvested in Western Siberia annually, yet the cooperatives and state trading organizations do not purchase more than 2,000 or 3,000 tons.

Blueberries are no less popular among the people who live in the Siberian taiga. They contain up to six per cent of sugar, seven per cent of tannin and citric and malic acid, and the organic dye anthocyan. Western Siberia could annually harvest 300,000 tons of blueberries and Eastern Siberia 200,000 tons, but trading organizations buy no more than 1,000 tons.

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Siberia, especially Western Siberia, has enormous resources of swamp cranberries, at least 500,000 tons annually. Cranberries contain large amounts of citric, quinic and benzoic acids, up to three per cent of sugar, and iodine and other microelements. In the old days Siberian cranberries were exported. Today, too, covered with powdered sugar they are considered a delicacy. They are also used as sauce to go with fish and meat and are added to tinned fish and sauerkraut.

Then there are raspberries, currants, wild strawberries, cloudberry, ashberry, bird-cherry and viburnum whose annual yields run into tens and thousands of tons. They have long been appreciated by the people, and science has proven their diverse value as food. State organizations, however, practically do not handle them at all.

The purchase of rose-hips, so rich in vitamins, by state organizations has dropped sharply. Wild rose bushes in the birch, pine and cedar forests of Siberia yield more than 20,000 tons of rose-hips a year.

Nor should we fail to mention sea buckthorn, which grows in the Altai and Krasnoyarsk territories, the Tuva and Buryat Autonomous Republics and a number of other places in the country. Buckthorn juice and jelly make fine foods for children and invalids. The oil from the berries that grow on these prickly shrubs contains a number of vitamins and is used successfully in the treatment of many illnesses, burns and overdoses of radiation.

The addition of buckthorn oil to butter makes it easier to digest and more nutritious. Scientists have long since recommended that buckthorn oil should be used in the food industry. The oil, however, is in short supply. Sea buckthorn is not particularly widespread, and many plantations of it would have to be laid out to satisfy the demand for this truly universal oil with its curative powers and high vitamin content. Even so, less than 10 per cent of the natural harvest is bought up by the state.

#### More About the Golden Nuts

Much has been said about cedar nuts but little done about them. Some figures say that Siberia produces up to three million tons of these nuts, but no more than 15,000 tons are purchased by the state. A special decision of the government, signed by Lenin, was passed on the purchase of cedar nuts. Decisions have been taken by the government of the Russian Federation, but so far there have been no tangible economic results.

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If the problem were solved we could obtain a nut harvest that would satisfy the entire country's fat requirements. So far we have, for the whole of Siberia, only one experimental cedar enterprise, the Gorno-Altai, and it is encountering great difficulties in its development.

From 100 hectares of cedar forest we can obtain annually, if it is comprehensively utilized, from three to five tons of extremely valuable oleoresin by tapping, and the tapping can be done for dozens of years before the trees are marked for felling; from 10 to 15 tons of nuts; from 50 to 100 tons of cedar needles from which feeding flour or carotene paste, of high vitamin content, can be made; from 1,000 to 5,000 cubic metres of cedar wood in the process of gradual felling.

In addition, this same area will yield an annual 100 to 150 kilograms of medicinal raw materials ranging in value from 300 to 1,000 roubles. These materials include herbs such as thorough-wax and Jacob's-ladder, and many other useful plants.

Licensed hunting and trapping of sable, Siberian stag, musk deer, bear, squirrel, American mink, wood grouse, hazelgrouse and other animals and birds should be carried out over the area, and taiga bee-keeping and gardening encouraged.

All-round cultivation of such a cedar area would bring in up to 7,000 roubles annually in profits per 100 hectares.

The same holds for pine, fir, birch and other forests. If we apply these figures to all of Siberia's forest output the income from forest by-products could be increased several times over. Taking Siberia as a whole, that would mean an additional 2,000 or 3,000 million roubles. This means that we could operate our forest economy, in its broadest sense, far more economically, to say nothing of the benefits stemming from an increase in our food resources, export products, and so on.

Surely it is time to get down to a serious and systematic planning of forest enterprises for the different zones in Siberia, and other places as well, for that matter. We must make comprehensive use of all types of forest raw materials.

A forest is more than a source of wood, food, furs and other raw materials. It is an important protective shell for mountain slopes and river banks and a frame of greenery for cities and industrial communities. Now that intensive development of many areas in Siberia has been started it is time to think of establishing wild-life preserves, national parks and zones of organized recreation.

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This applies, first of all, to the Altai and Sayan mountains, where the great Siberian rivers, the Ob, the Irtysh and the Yenisei, take their source. It also applies to the big Siberian cities--Novosibirsk, Krasnoyarsk, Omsk, Barnaul, Tyumen, Kemerovo and Novokuznetsk among them-- and to the shores of the Ob, Krasnoyarsk and Sayano-Shushensk reservoirs.

The southern regions of Siberia, with their beneficial climate, ought to be preserved for posterity and turned into places of wholesome recreation and mass-scale "cultured" tourism. I use the word "cultured" advisedly since not all tourists treat the gifts nature bestows on us with the proper care.

A splendid law on nature conservation was passed in our Russian Federation five years ago. It deals, intelligently and with great foresight, with the conservation of the forests, waters, soils and valuable flora and fauna. But little has been done so far to popularize the law.

The problem of the intelligent use of nature, primarily utilization of the forests, taking into account the interests of present and future generations, is not, of course a simple problem in arithmetic. It is a big job for the people and the government, in which the State Planning Committee, the industrial ministries and the local Soviets should take the lead, but science and the branches of the all-Russian Nature Conservation Society have important roles to play, too.

It is time to replace the haphazard, infinitely meager gathering of nature's gifts with comprehensive, balanced development of all the natural resources of every district in the country, hand in hand with renewal work based on long-range scientific plans.

The author of this article was Professor G. Krylov

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Sibirskie Ogni  
No. 1, 1966 (Abridged)

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TRANSPORT AIR

The High Latitude Expedition North - 18

The helicopter was loaded at the Sheremet'yevo Airport for a round trip Moscow-Dikson-North Pole-Moscow. The departure time was set for 14:30 hours. The aircraft was an orange coloured MI-4 helicopter (No. 04334). The latter was piloted by Lev Anton'yev. The co-pilot was V. Gromov. The route was as follows:

Moscow  
Cherepovets  
Vologda  
Sukhona  
Kotlas  
Ukhta

Izvestiya  
17 March 1966  
Page 6 (Extracts)

Offer of Employment at the Nyurba Airport

Vacancies in the following specialties were advertized for the Nyurba Airport of the Yakut Administration of Civil Aviation.

Aviation technicians  
Radio technicians  
Engineer-mechanics  
Senior Engineer (Construction)  
Power Engineer  
Engineers (Radar)

Applications to be addressed to:

Personnel Department,  
Yakut ASSR,  
Settlement Nyurba, Airport.

Trud  
19 March 1966  
Page 4 (Abridged)

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### Pipeline Airlift

The first section (Ust'-Balyk-Dem'yanskoye) of the Ust-Balyk-Omsk oil pipeline will be in operation this spring.

It requires several days to deliver pipes by truck from Tyumen' to Dem'yanskoye. In order to accelerate this project AN-12 aircraft were placed into service. Each aircraft is capable of carrying three 12 metre pipes. Excavators and bulldozers are also airlifted.

Izvestiya  
24 March 1966  
Page 6 (Extracts)

### Aircraft in Arctic Skies

The high latitude expedition "North-66" is in progress. The Polar Aviation will be used to bring relief personnel to station NP-13, to establish the new drift station NP-15 and to deliver automatic radio-met beacons to pre-arranged sites.

Several temporary bases are being established on drifting ice in various parts of the Arctic. These bases will be used to accommodate MI-4 helicopters and AN-2, LI-2 and IL-14 aircraft. AN-12 aircraft will be used to ferry supplies and equipment for these bases.

Sovetskaya Rossiya  
26 March 1966  
Page 4 (Slightly abridged)



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TRANSPORT RAIL

The Railway Line Tyumen'-Tobol'sk -Surgut

Personnel of the construction-assembly train No. 269 (Stroitel'no-montazhnyy Poyezd) are engaged in route clearing operations. The mechanized column No. 32 of Uralstroymekhanizatsiya trust have established their quarters next to the personnel of train No. 269.

The bridge-building train No. 470, the repair-construction train No. 38 and the mechanized column No. 21 are concentrated at Tobol'sk.

The railway line is moving forward to the heart of the Middle Ob' oil area. Thereafter it will reach the Angara, Baykal, Amgun' and after crossing the Amur, will end at the Pacific Ocean. Thus the "Sevsib" or the Northern Trans-Siberian line will be established.

Sovetskaya Rossiya  
17 March 1966  
Page 3 (Abridged)

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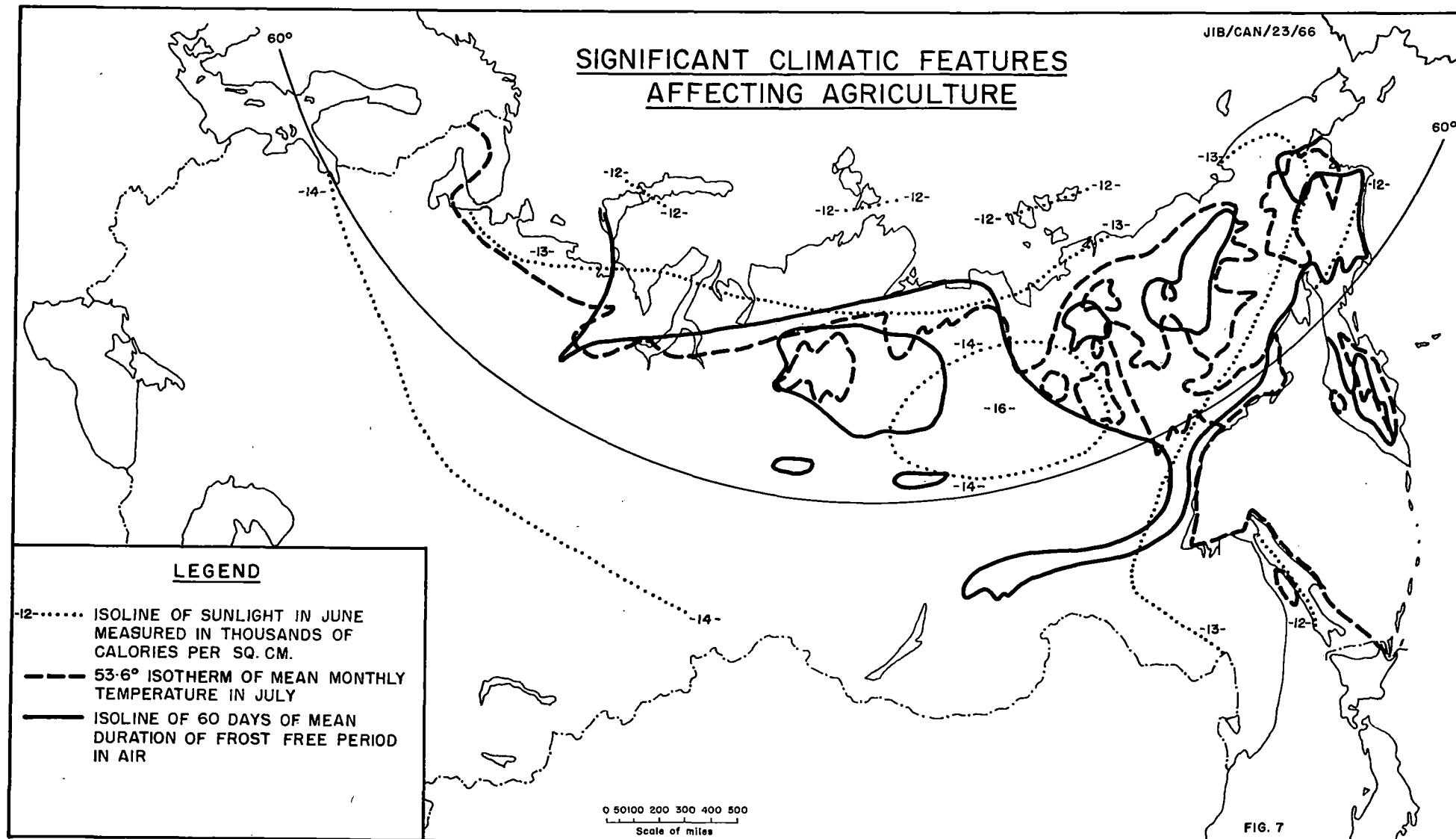
TRANSPORT ROAD

New Trucks for the Diamond Region

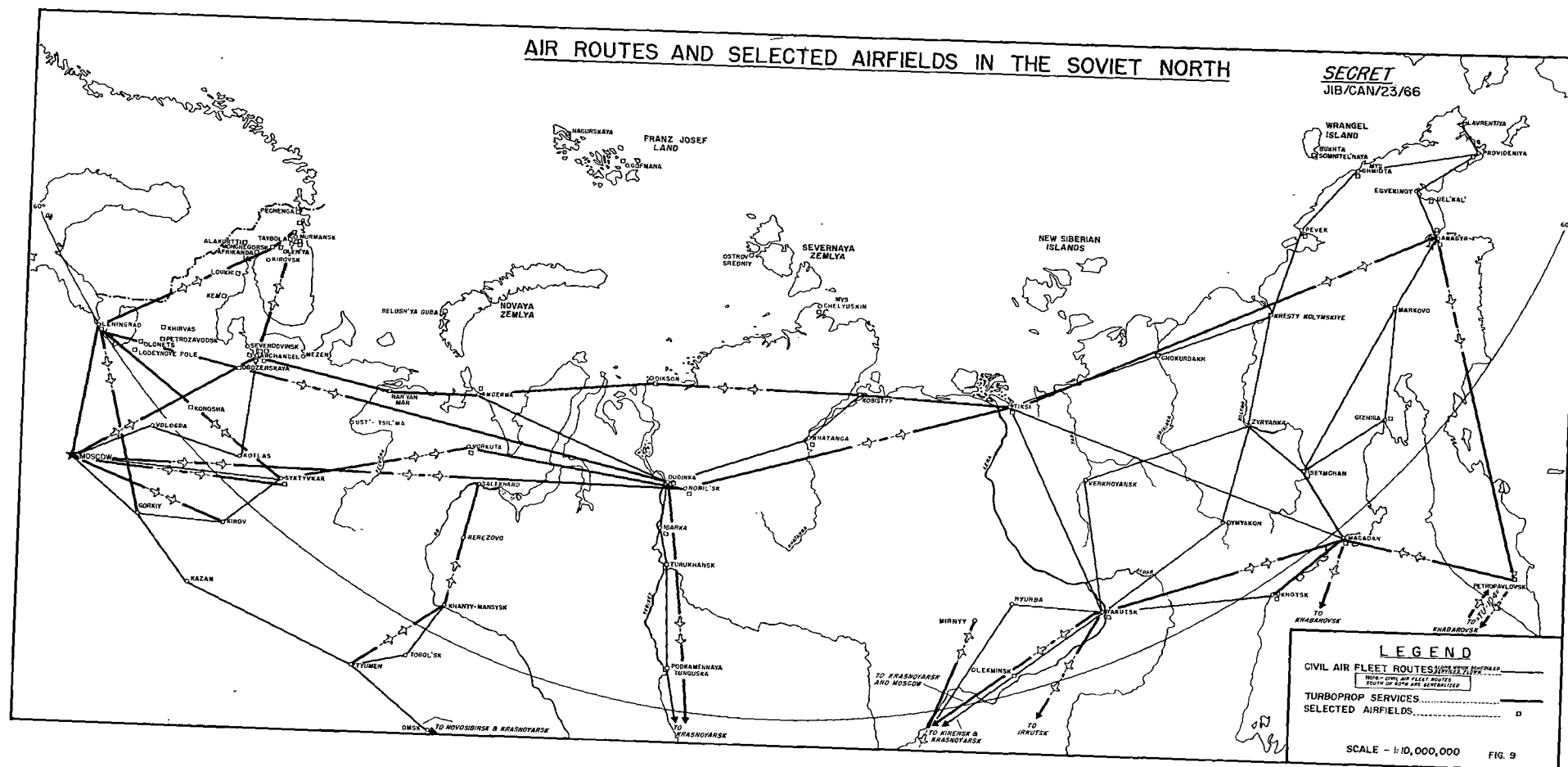
New MAZ and KRAZ vehicles have appeared on the roads of the "diamond" region. These heavy duty dump trucks were delivered by air to isolated locations in the Yakut ASSR.

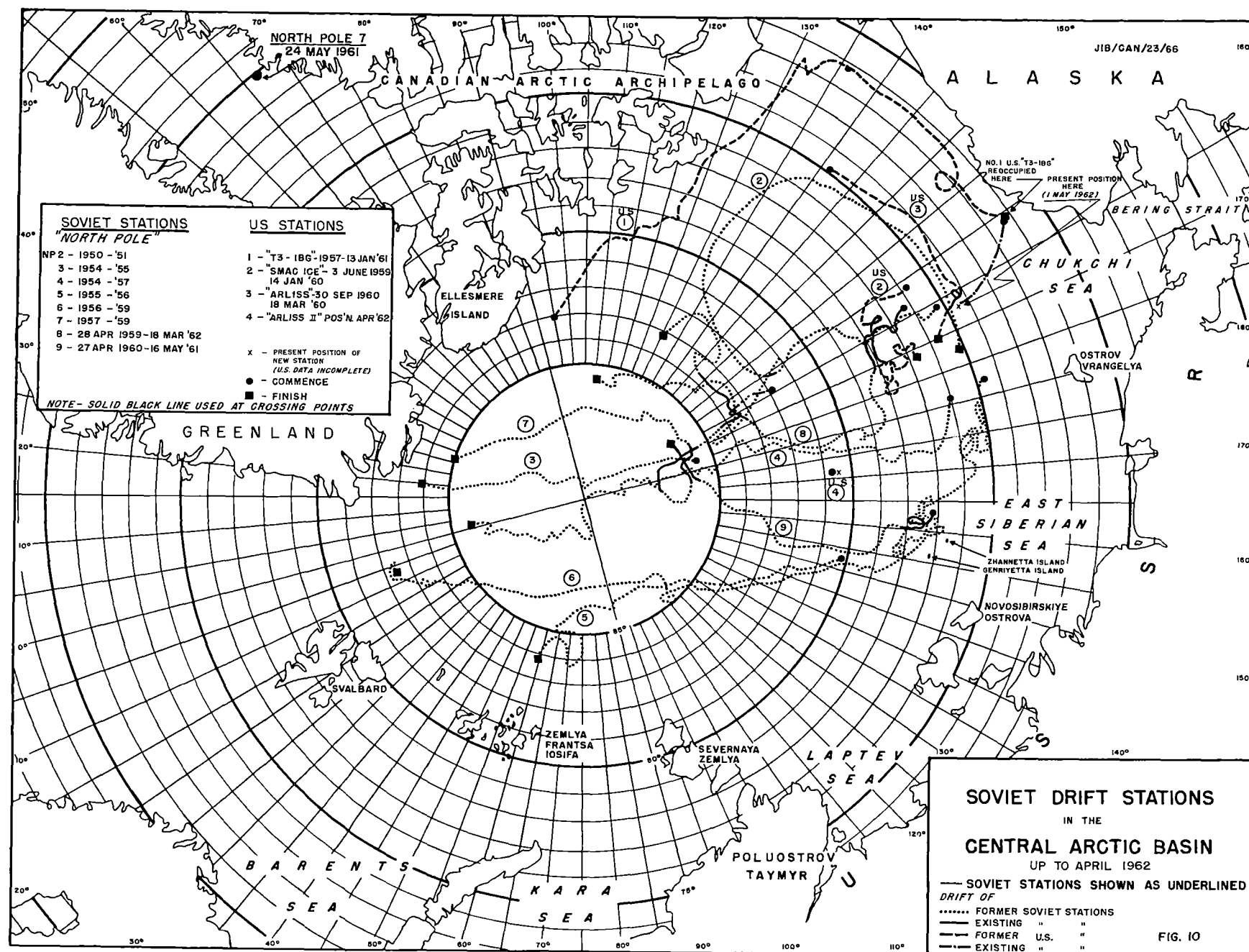
The airport at Mirnyy has become the delivery point of heavy cargo. About 50 vehicles have been delivered by AN-12 aircraft.

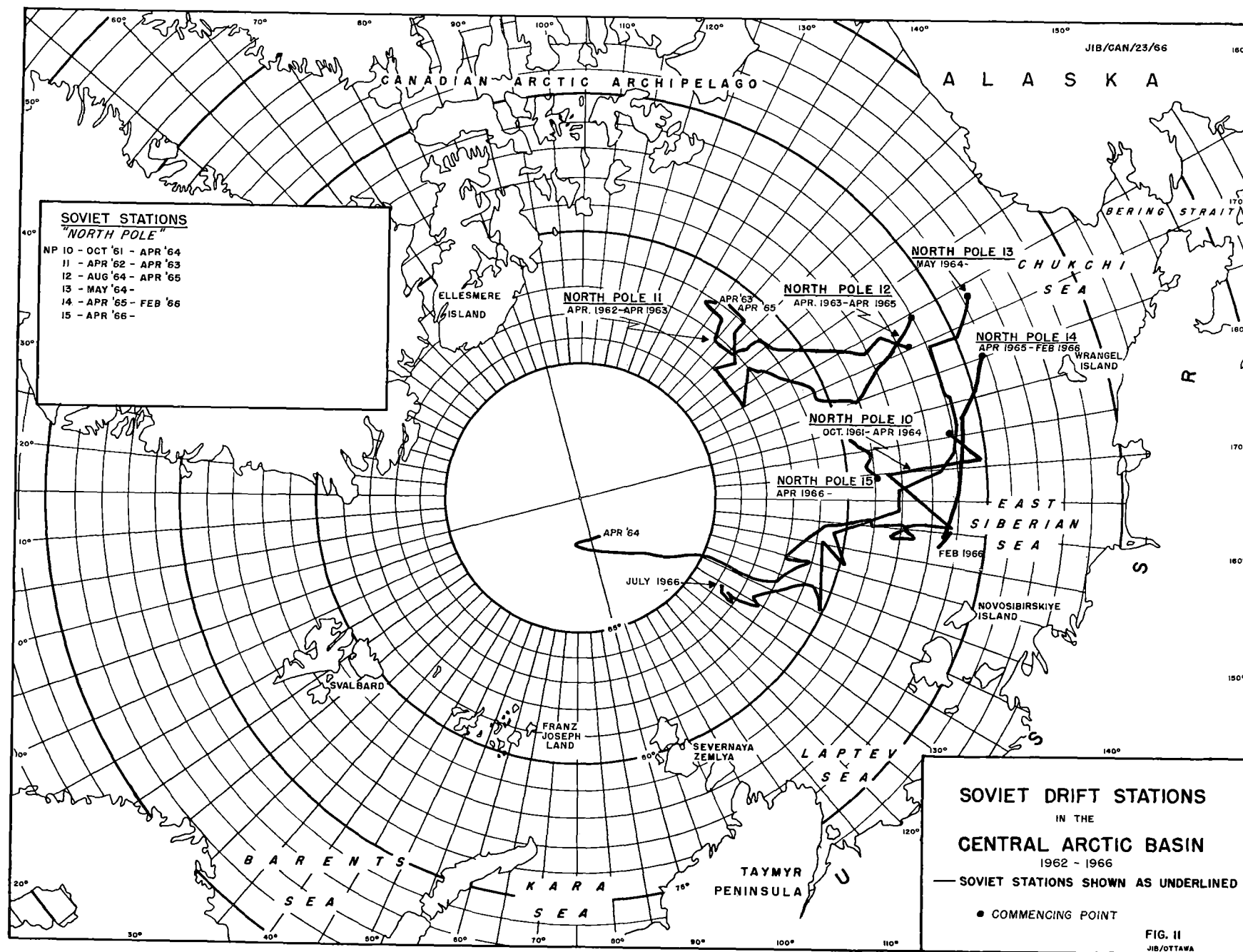
Trud  
4 March 1966  
Page 1 (Extracts)











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## TRANSPORT WATER

### Icebreakers for Exploration

Soviet explorers have been storming the Arctic for decades. Drifting observatories and Arctic stations on islands and Archipelagoes serve as outposts for this offensive. It might seem that the Northern Sea Route has been well mastered long ago. Nevertheless, there still are many "blank spots" on the map of the Arctic. The Arctic finds it difficult to disclose its "secrets", but man has powerful equipment to help him: airplanes, icebreakers, helicopters, caterpillar cross-country vehicles, radio-communication, radar and perfect research instruments. Soon Polar explorers will get in addition to all that special vessels, the construction of which has been started in Leningrad.

A large building in Moscow Avenue houses the Hydrographic Enterprise of the USSR Ministry of the Merchant Marine, a research centre engaged in studying northern seas and in publishing maps and sailing directions.

"Our main task is to ensure the safe navigation of vessels," says V.I. Peresypkin, the chief engineer of the enterprise. "This makes us conduct our scientific work on a wide front, as it were. The point is that we must give an all-round analysis of numerous phenomena, specific for the Arctic. This applies to current condition, to the chemical composition of water, to temperature fluctuations, and many other things.

"Lately, when such powerful icebreakers as the atomic vessel "Lenin", "Moskva", "Leningrad" and others have started serving the Northern Sea Route, there has appeared the possibility of conducting icebreakers through ice under much more difficult navigation conditions. That is why hydrographers are confronted with new research problems. It is necessary to make a most thorough investigation of the areas where these great Arctic vessels are operating at present. Arctic sea explorers pin great hopes on specially equipped icebreakers to be built by the Admiralty Shipyards to orders placed by the Ministry of the Merchant Marine".

Every hydrographic vessel has its own specific operating features. The study of one or another area of the sea requires a great number of exploration cruises or, as scientists put it, the covering of the area by parallel tracks. The exploring icebreakers, which we are talking about, will have a cruising autonomy of 12,000 miles.

Here is what N.A. Senkin, Assistant Chief Designer of hydrographic vessels, told us:

"The new research vessels have been designed on the basis of port icebreakers which have shown good performance in the Arctic. They have a passability through ice quite sufficient for carrying out the cycle of explorations beyond the Arctic Circle.



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Activities in the Underdeveloped Areas

August 1966

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Communist Economic and Military Aid  
Activities in the Underdeveloped Areas

August 1966

PART I: ECONOMIC AID

ASIA

Indonesia

1. The Soviet Union has suspended work on the large Asahan hydroelectric project in Sumatra and the Soviet technicians employed at the site have returned to the Soviet Union. The project was being financed under a Soviet credit extended in 1960 and valued at \$250 million. Indonesia's inability to pay its share of the costs is probably the reason for the abandonment of the project.

(RESTRICTED)

2. Indonesia's economic relations with Communist China are now almost non-existent. Trade between the two countries has practically ended since the Indonesian government declared an embargo in November, 1965 on all trade with China, thus cutting off their second most important rubber outlet. The embargo apparently has now been lifted, but trade between the two countries is now believed to be at an extremely low level. A few Chinese ships have arrived in Indonesia recently and the Chinese are purchasing some Indonesian rubber; however China's purchases from Singapore are likely to substantially reduce its purchases from Indonesia.

(RESTRICTED)

3. All Chinese aid activities in Indonesia have also been curtailed, and technicians employed on Chinese sponsored projects have been ordered to leave Indonesia.

(SECRET)

Afghanistan

4. A \$28 million loan from Communist China to Afghanistan, extended in late 1965, was ratified in July, 1966 when an Afghan delegation visited Peking. The Chinese loan is being used to finance irrigation schemes in northern Afghanistan, the development of Afghanistan's silk industry and for the construction of a textile mill in Kabul. Chinese technicians will also study the building of a dam on the Hari-Rud river near the Iranian border. A previous commitment under the Chinese loan was the provision of \$7 million worth of Chinese commodities to be sold in Afghanistan in order to generate local currency for Chinese sponsored projects.

(RESTRICTED)

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5. Soviet and Afghan officials are reported to have been discussing additional Soviet aid for Afghanistan's third five year plan (1967-1972) According to a US report the Soviet Union may extend a \$50 million commodity credit and a new \$100 million development credit. One of the projects discussed for inclusion in the new development plan was an iron ore smelting plant and a contract has been signed under which Soviet technicians will study the feasibility of such a plant. The Soviet study is to be completed at the end of Afghanistan's current five year plan. (RESTRICTED)

6. Under a recent agreement concluded in Warsaw, Poland is extending Afghanistan economic aid for the construction of several small-scale industrial plants, including textile factories, a glass factory, a wool processing plant, a vegetable oil plant and a soap factory. The value of the credit extended by Poland is reported to be about \$3.5 million with a proviso that its value may be increased when the initial funds have been fully utilized. (CONFIDENTIAL)

7. Recently Afghanistan and Czechoslovakia concluded an agreement under which Czech technicians will arrive in Afghanistan in two months' time to study the feasibility of a cement factory in Herat. (UNCLASSIFIED)

#### Pakistan

8. Communist China and Pakistan have agreed upon the first project to be financed under a \$60 million Chinese loan extended to Pakistan in July 1964. Under the agreement Communist China will provide machinery and technical assistance for an engineering complex near Rawalpindi. The complex will manufacture machinery for heavy industries including cement works, sugar refineries, cranes and railway equipment. It will also support Pakistan's munitions industry and help service the Armed Forces' heavy equipment, (CONFIDENTIAL)

9. Pakistan and Czechoslovakia have formalized an agreement under which Czechoslovakia is extending Pakistan a \$28 million credit for its third five-year plan instead of the \$70 million loan that reportedly had been agreed upon in March, 1966 (JIB(CAN) 8/66). Part of the Czech credit is obligated for the construction of a fertilizer plant and a thermal-electric power plant. Other projects being considered include a sugar factory and a hydroelectric power plant. The credit is to be repaid over a ten-year period with interest at 2.5 per cent. (RESTRICTED)

10. A Rumanian economic delegation visited Pakistan in July, 1966 and concluded the first trade agreement between the two countries. The delegation also investigated possible areas of economic collaboration with Pakistan especially in the petro-chemical industry and oil exploration. (UNCLASSIFIED)

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Malaysia

11. The Malaysian government announced on 30 August that it is establishing formal relations with the Soviet Union in the near future. (UNCLASSIFIED)

MIDDLE EAST

Syria

12. Following a recent visit to Syria by a Hungarian economic delegation, Hungary has agreed to extend to Syria \$14 million in economic credits to be used for the importation of Hungarian equipment and machinery for Syrian development projects. (CONFIDENTIAL)

Turkey

13. The US Agency for International Development (AID) has announced the extension of a \$40 million loan to Turkey as part of a multi-national financing scheme for the construction of a large hydroelectric project on the Euphrates River. The total cost of the project is estimated at \$338 million of which \$135 million will be in foreign exchange which has been pledged in the form of loans by an international lenders group. (UNCLASSIFIED)

14. The AID loan is repayable by the Turkish government in dollars within 40 years, including a 10-year grace period with annual interest at 1 per cent during the grace period and 2.5 per cent thereafter. (UNCLASSIFIED)

15. Following the visit of a Soviet trade delegation to Turkey a Turkish press announcement stated that the protocol concluded for 1966-1967 trade between the two countries exceeded by 30 per cent, or \$12.5 million, that of last year. According to Turkey's trade minister total trade under the new protocol will be about \$89 million. (UNCLASSIFIED)

Iran

16. The Soviet Union and Iran concluded an agreement at the end of July concerning joint Iranian - Soviet participation in the construction of the Aras Dam at a cost of about \$12 million. The project is expected to be completed in 20 months and will include the construction of roads linking the dam site with main roads in the Soviet Union and Iran. Foreign exchange expenditures under the agreement will be made from a \$39 million Soviet credit extended to Iran in 1963. (CONFIDENTIAL)

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CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

JIB(CAN) 24/66

- 4 -

17. According to an Iranian report about 400,000 tons of Iranian goods will move this year through Soviet transit routes. In 1963 only 80,000 tons passed through Soviet territory. The cost of transporting Iranian goods to Europe through the USSR is lower and the distance is shorter. (UNCLASSIFIED)

18. Iran and Rumania have concluded an economic agreement under which Rumania has agreed to establish tractor repair centres in Iran. At a later date, Rumania has agreed to provide a complete tractor assembly line with an annual capacity of 5,000 tractors. The final phase of the Rumanian aid programme calls for the construction of a tractor plant with a production capacity of 5,000 tractors in the period 1970-1972. (UNCLASSIFIED)

#### LATIN AMERICA

##### Brazil

19. A US report states that Brazil is planning to make offers to purchase merchant ships from Poland and Yugoslavia. Brazil previously bought 15 freighters from Poland and, according the US report, plans to buy 20 new freighters valued at about \$100 million. Payment for the freighters would be made in stock-piled coffee over a 12-year period. A Brazilian proposal to purchase 2 super tankers constructed in Yugoslavia includes payment in agricultural goods and two Brazilian-built freighters. (CONFIDENTIAL)

#### AFRICA

##### Mali

20. According to a US report the Soviet Union and Communist China are stepping up their economic aid activities in Mali. The Soviet Union, in an attempt to counter Chinese activities in Mali, is looking into a number of development projects proposed by Mali, including a meat canning factory, a tannery and a railroad linking Bamako with Kankan in Guinea. These projects are to be financed under outstanding Soviet credits of about \$25 million. The Soviet Union is reported to have refused a Mali request for hard currency loans but has offered to provide a \$2-\$3 million commodity credit to help generate local currency funds for Mali. In addition, in October, 1965 the Soviet Union agreed to postpone Mali's debt repayment until 1970, and to cancel all unpaid interest.

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JIB(CAN) 24/66

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21. While Communist China has suffered several setbacks in Africa during the past year it has continued to strengthen its position in Mali and recently provided Mali with a \$3 million cash loan and reportedly has promised to provide additional hard currency loans in the period 1967-1970.

22. The total value of communist economic aid to Mali is estimated at about \$121 million including \$58 million from the Soviet Union, \$23 million from the East European communist countries and \$40 million from Communist China.  
(SECRET)

23. It has now been disclosed that under an agreement concluded with Mali in September, 1965, Czechoslovakia has agreed to provide Mali with small transport aircraft. The agreement also provides for the training of Malian technicians in Czechoslovakia.  
(RESTRICTED)

24. The aircraft purchase is probably being financed out of a \$12.5 million extended to Mali in 1965. However, a new Czech credit extension to Mali cannot be ruled out.  
(RESTRICTED)

#### Ghana

25. According to a UK report it is possible that the Soviet Union has imported only about 18,000 tons of Ghana's 1965/1966 main cocoa crop and not the 50,000 tons contracted for in an agreement concluded in December, 1965. Poor harvests may have affected cocoa sales, but it is more likely that there has been a revision of the contract.  
(CONFIDENTIAL)

26. According to a press report from Accra dated 6 September, 1966 Ghana has notified the Soviet Union, Communist China and the East European communist countries that it wants to renegotiate the trade agreements signed by former President Nkrumah's government.  
(UNCLASSIFIED)

#### Guinea

27. Communist China recently completed the construction of a hydroelectric installation at Kinkon under its aid agreement with Guinea. Approximately 300 Chinese were employed on the Kinkon project and most of them are now expected to return to China or to be employed on other Chinese aid projects in Africa. A number of technical personnel are being retained at the Kinkon project to supervise and train Guineans in the operation of the equipment. (CONFIDENTIAL)

28. Other Chinese projects in Guinea include a hydroelectric installation at Tinkisso and a transistor radio plant in Conakry.  
(CONFIDENTIAL)

#### Upper Volta

29. The government of Upper Volta has announced that it plans to establish

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CANUKUS EYES ONLY

JIB(CAN) 24/66

- 6 -

economic and diplomatic relations with the Soviet Union and possibly Poland and Czechoslovakia. The decision to establish relations with the communist countries is probably due to Upper Volta's extremely poor economic situation and its limited means to generate development capital locally. An approach to the Soviet Union for aid is therefore a distinct possibility. (CONFIDENTIAL)

#### Rwanda

30. The Soviet Union and Rwanda recently discussed plans for economic cooperation including a mineral survey to be made by the Soviet Union and Soviet aid in the form of equipment for the construction of roads. A Soviet credit offer is likely to be forthcoming in the near future. (UNCLASSIFIED)

### PART II: MILITARY AID

#### ASIA

#### India

##### Arms Procurement from USSR and Czechoslovakia

31. India, like Pakistan, has been actively procuring arms in order to make good the losses of the 1965 war with Pakistan and to further increase its military strength. The USSR continues to be the major source of supply and the arms being shipped are probably largely covered by the agreement reached in November 1965, which is believed to total at least \$150 million (US). Czechoslovakia also plays an important role, largely in the provision of tanks. Large numbers of tanks are being obtained, possibly up to a total of between 600 and 700. This includes some 176 PT-76 amphibious light tanks from the USSR, all but 18 of which are believed to have been received, 225 T-54A medium tanks (plus 25 to 35 specialist tanks) from Czechoslovakia (180 received) and a further 225 medium tanks, in this case T-55's, reportedly ordered from the USSR. About 60 of a total order of possibly 400 Soviet 130 mm guns are reported to have been delivered. The major item of aircraft procurement is the MIG-21, over 100 of which are believed to have been received from the USSR, including about 50 for assembly in India; the final number to be procured may be 185. During August the Indian defence minister is reported to have said that to date 69 MI-4/HOUND helicopters had been received, and 40 more are known to be on order. (SECRET)

##### Submarine Training in USSR

32. The Canadian Naval Attache, Moscow, has reported that two Indian submarine crews are undergoing training in Vladivostok. India is expected to receive four submarines, possibly F-class, from the Soviet Union.

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CANUKUS EYES ONLY

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CANUKUS EYES ONLY

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Reported Completion of MIG Assembly Plant

33. The Indian Minister of Defence Production is reported to have announced on 25 July that the MIG-21 assembly plant at Nasik, near Bombay, had been completed and that assembly of aircraft had begun recently. This plant, being built with Soviet assistance, has been under construction since 1964. As mentioned in para. 18 above, MIG-21 components are being shipped to India, presumably for assembly at Nasik.  
(SECRET)

Pakistan

Arms Procurement from China

34. Pakistan is continuing to receive substantial amounts of military equipment from China, with the latest count of major items being as follows:

- (i) Tanks - 150 received, most of which are T-59's (Chinese version of T-54) and remainder T-34's. Total contract may be for as many as 300.
- (ii) Artillery - possibly two hundred 122 mm howitzers delivered with perhaps another hundred to come.
- (iii) Small arms - sufficient quantity for at least one and possibly two divisions.
- (iv) Aircraft - at least 50 MIG-19/FARMER's received; total order believed to be for at least 100.  
- nine to twelve IL-28/BEAGLE light bombers received.

(SECRET -  
CANUKUS EYES ONLY )

Possible Future Arms Purchase from USSR

35. There is still no information to indicate whether or not Pakistan and the USSR will arrive at an arms agreement. A senior Pakistani military delegation went to Moscow in late June (see

JAWG Brief 7/66, para 22)

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SECRET  
CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

JIB(CAN) 24/66

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JAWG Brief 7/66, para 22) and it seems certain that the procurement of arms from the USSR was discussed. The mission returned home about 8 July, reportedly pleased with the results of the visit, but without an agreement having been signed. It is still not clear whether the initiative came from the Pakistani or Soviet side. Evidence is contradictory, with one report from Moscow stating that the Russians were disappointed that no agreement had been reached, while other reports indicate that the initiative came from Pakistan and that the Russians were non-committal. In any case it seems likely that the USSR probably agreed to provide some arms aid to Pakistan and that the latter is giving the matter further study.

(SECRET)

#### MIDDLE EAST

##### UAR

##### Presence of T-55 Tanks Confirmed

36. One hundred and twenty Soviet T-55 medium tanks, fitted with night vision equipment, were included in the 23 July military parade in Cairo, confirming their presence in the UAR. The delivery of T-55's to the UAR, under the major arms agreement of 1964, probably began in 1965, and possibly 200 in all are to come. The UAR is the first non-Communist recipient of Soviet military aid to receive T-55's; 105 T-55's are to go to Iraq under the new Soviet arms agreement with that country, and India has reportedly ordered 225 of these tanks from the USSR. All of the other major items of military hardware shown in the parade have previously been confirmed as being in the UAR.

(SECRET/CANUKUS EYES ONLY)

##### Forthcoming Delivery of SU-7/FITTER Aircraft

37. According to a U.S. report the first delivery of SU-7/FITTER supersonic tactical strike aircraft will probably occur this fall. This will mark the first delivery by the Soviet Union of the SU-7 to a non-Communist country; Iraq is also to obtain SU-7's under its new agreement with the USSR but delivery is not expected to begin until late 1967.

(SECRET)

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SECRET  
CANUKUS EYES ONLY

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CANUKUS EYES ONLY

JIB(CAN) 24/66

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AFRICA

Algeria

Further Arms Deliveries

38. The steady flow of Soviet military aid to Algeria continued during July and August, with four Soviet freighters apparently making deliveries during the period. The FIZIK LEBEDEV made two trips during August and on its first trip its cargo apparently included four MIG-15/FAGOT and 17 MIG-17/FRESCO jet fighters, 16 T-54 tanks and 17 BTR-152 armoured personnel carriers; later in the month it brought six IL-28/BEAGLE light bombers and numerous aircraft component crates. The main items delivered during July were 10 MI-4/HOUND helicopters and three oxidizer trailers (presumably for the SA-2 missiles received earlier). Over 40 trucks and a few artillery pieces (two 100 mm AA guns and one 122 mm gun) were also delivered. (SECRET)

39. The upsurge in deliveries to Algeria began earlier this year and so far in 1966 at least 14 Soviet ships have carried military cargoes there. These deliveries have included, in addition to the aircraft mentioned above, 20 MIG-21FL jet fighters, at least 10 more MI-4's, surface-to-air missile equipment and a large assortment of ground forces equipment. Some reports have intimated that the Soviet Union may deliver some naval equipment to Algeria this fall. However, up to the present time, only one small naval auxiliary vessel has been delivered this year. (SECRET)

Guinea

Military Mission to Moscow

40. A Guinean military mission visited Moscow in July, 1966 but no information is available on whether a new arms deal was concluded. However, the mission met with Soviet military officials responsible for arms supplies. Guinea concluded an arms agreement with the Soviet Union in 1965, on which no details are available but which was probably of the order of a few million dollars, and the discussions in Moscow may have dealt with deliveries of military equipment under this agreement. (CONFIDENTIAL)

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SECRET  
CANUKUS EYES ONLY

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CANUKUS EYES ONLY

JIB(CAN) 24/66

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Mali

Delivery of Fighter Aircraft

41. Five Soviet military AN-12/CUB transport aircraft delivered crated MIG-15/FAGOT or MIG-17/FRESCO jet fighters to Bamako, Mali on 12-13 July. These aircraft are believed to have been ordered under a Soviet-Malian arms agreement concluded in October, 1965. This is the first time that Soviet transport aircraft are known to have been used to deliver jet fighter aircraft to any of the underdeveloped countries. (CONFIDENTIAL)

Somalia

Further Arms Shipments

42. Two more shipments of Soviet military equipment, consisting mainly of vehicles and miscellaneous items and spares, arrived in Somalia in July, marking at least the seventh and eight deliveries of 1966. According to one report a Soviet Deputy Minister of Foreign Affairs promised Somalia that deliveries under its 1963 military aid agreement with the Soviet Union would be completed in July 1965. Recent statements by Somali government officials indicate that, so far as army equipment is concerned, this may have been accomplished. However, it is believed deliveries of naval and air equipment are still outstanding. Recent deliveries of Soviet arms not previously reported include eight 122 mm field guns, an estimated 180 vehicles and some twin 37 mm anti-aircraft guns. (SECRET)

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CANUKUS EYES ONLY

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They have several distinctions from their forerunners. These vessels will be one deck higher, since their superstructures will carry an additional structure about two and a half metres high. The dimensions of the smoke stack will be increased. All this applies to the icebreaker silhouette. As to the interior, some premises are being fundamentally replanned. The point is that, first of all, the vessel will accommodate scientists in addition to her crew and, secondly, there will be laboratories on board.

These vessels will be the first to carry some new technical facilities. An electronic computer will guarantee the prompt solution of hydrographic problems. At the same time, it will be extremely helpful to the navigation staff in plotting the vessel's route. Incidentally, these icebreakers will be also provided with equipment that will define the location of the vessel with great precision.

We must also mention the remote-control hydrometeorostation for measuring wind direction and force and the air and water temperature and humidity. A special transducer unit will pass the signals on to the instruments without any human assistance.

A phototelegraph device will serve for the reception of synoptic and ice maps from radio-meteorological centres. Picture of them will be radioed over great distances within a matter of minutes.

The latest echo-sounders will be entrusted with measuring depths. Special depth measuring motor-launches will be employed in shallow and coastal areas which the icebreaker is unable to approach due to its large draught. These will also be equipped with echo-sounders and other devices. The new icebreakers will also take on themselves the functions of "buoy keepers" beyond the Arctic Circle. These vessels will also be used for landing combined expeditions provided with powerful tractors, cross-country vehicles and helicopters.

The first of these vessels is to be registered in Archangelsk, and the second, in the Provideniya Bay.

REPRINTED FROM DAILY REVIEW  
OF SOVIET PRESS, MOSCOW

Leningradskaya Pravda  
February 4, 1966  
(Full text)

SECRET  
JIB(CAN) 24/66

TABLE I

Communist Economic Aid Extensions

1 January - 31 August 1966

		(Million US\$)
<u>Extended By</u>	<u>Recipient</u>	<u>Value</u>
Soviet Union	Iran	290.0
	Pakistan	20.0
	Turkey	33.0 *
	Syria	148.0
	Cameroun	7.7
	UAR	165.0 **
	Burma	14.0
	Somalia	4.2
	India	<u>630.0</u>
		<u>1,311.9</u>
Czechoslovakia	Pakistan	<u>28.0 ***</u>
Hungary	India	52.5
	Syria	<u>14.0</u>
		<u>66.5</u>
Bulgaria	Syria	<u>15.0</u>
Communist China	Tanzania	8.5
	Cambodia	<u>42.9</u>
		<u>51.4</u>
	<u>TOTAL</u>	<u>1,472.8</u>

\* The value of the loan to Turkey in 1965 has been revised upward to \$200 million, an increase of \$33 million

\*\* Offer only, not confirmed

\*\*\* Credit originally reported to be valued at \$70 million

SECRET

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New Role for the Vessel Bataysk

Formerly the Bataysk used to carry lumber, apatite concentrate and other cargo. Today the crew consists of students of the nautical school. This vessel provides practical training for students from all marine schools of the U.S.S.R.

The Bataysk has recently returned to Murmansk after a 6 month cruise which gave practical training to students from the Murmansk nautical school (Murmanskoye Morekhodnoye Uchilishche) and the Tekhnicum of the Fishing Industry.

The vessel has left Murmansk again with students from Archangel, Odessa and Rostov. The training will take place in the Atlantic.

Vodnyy Transport  
24 March 1966  
Page 1 (Full text)

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## MISCELLANEOUS

### The Weather Station Mishvan'skaya

Tamara El'neva and Iulia Zhiryakova are two female radio operators and weather technicians employed at the Mishvan'skaya meteorological station. Both women have graduated from the Novosibirsk Radio-Technical School and have selected the Arctic as their first place of work.

Izvestiya

3 March 1966

Page 6 (Full text)

### The Multi-Purpose Air Sled

The new air sled, a speedy and reliable means of transportation, has been developed by a team of designers headed by N. Kamov. The designers took account in their work of the four-year experience of the exploitation of the Sever-2 air sled, also designed by Kamov, which covered a total distance of over two million kilometres in the basins of the Ob, the Lena and the Amur. Now, the KA-30 air sled has appeared. Here is what Victor Ivanovich Biryulin, deputy chief designer, has to say about the new machine:

Its beautiful and spacious body has a front seat for two passengers and a compartment for one ton of cargo or eight passengers (or four patients on stretchers). The body rests on four skis. The air sled is fitted with very soft aircraft-type pneumohydraulic shock absorbers. The 260 hp plane piston engine for air cooling is situated in the rear. The engine is fitted out with an aircraft-type three-blade metal reversible screw propeller.

The air sled has powerful headlights, a searchlight, double unfreezing windshields with wipers. The heaters not only warm up the engine before they start; during the trip passengers in the cabin can take their overcoats off.

The fact that the air sled design employs aircraft-type standards and norms ensures it trouble-free operation in high air humidity and 60° frost.

The KA-30 air sled will come very handy for postmen, physicians, geologists, deer breeders, hunters and builders.

Recently the designers of the KA-30 mounted it on a catamaran. At a speed of more than 500 kilometres an hour the air sled, turned into a glider, easily overcome waves half a meter high. Now it can faithfully serve people all the year round.

Nedelya

No. 3, 1966

REPRINTED FROM DAILY REVIEW  
OF SOVIET PRESS, MOSCOW

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### Oil From the Arctic Ocean

"One of my friends assures me that the Arctic Ocean is rich in oil. Is this true or false"? Such was the question submitted to this paper by a reader named I. Voronov, from Lipetsk.

The answer was provided by Dr. M. Kalinko of the All-Union Scientific Research Institute for Oil Exploration.

The Number of surveyed oil deposits is increasing from year to year. This is specially true at the present time when exploration for oil is being conducted underwater.

Early in the 19th Century the first oil from the bottom of the sea was extracted in the area of Baku. Today, sixteen submarine oil deposits have been uncovered. In the USSR explorations for oil are being conducted in the Caspian, Azov, and Okhotsk Seas. Geophysical surveys are being made in the Ob' bay (Obskaya Guba) and the Ust'-Yeniseyskiy Inlet (Zaliv).

It is impossible to estimate the amount of oil concealed by the Arctic Ocean. The Pechora, West-Siberian and Khatanga depressions stretch out into the waters of northern seas. The Central Polar Basin itself is in the form of a huge bowl. Every such bowl is known to contain both oil and natural gas.

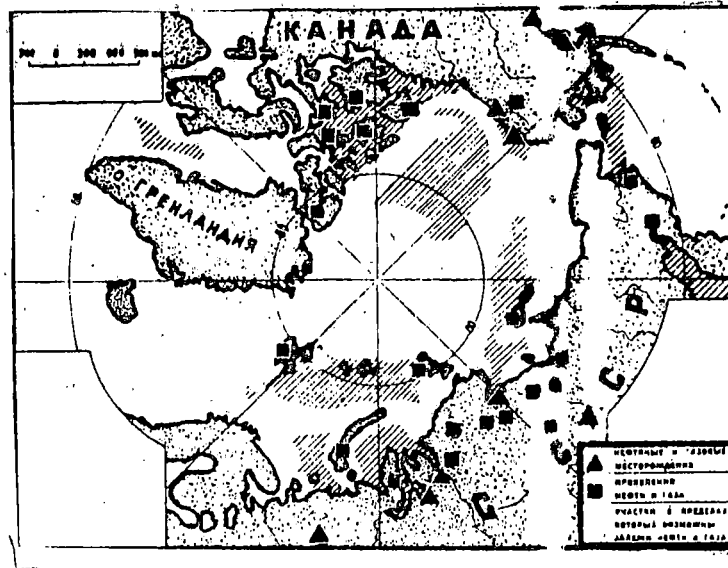
Traces of oil and gas have been found in the Arctic islands of Kotelnyy, Spitsbergen and Novaya Zemlya. Large deposits of bitumen have been discovered in the lower reaches of the Olenek. Oil has been obtained in Nordvik from perma-frost soil.

Even today, the ocean floor has been drilled through a 72 metre layer of water. With time and more sophisticated equipment, the extraction of oil and gas from the Arctic Ocean will become a reality.

It is estimated that 15 to 20 years will be required from the time the first surveys are made to actual production.



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# Oil and Gas in the Arctic Ocean

## Legend

- ▲ Oil and gas deposits
- Traces of oil and gas

Izvestiya  
4 March 1966  
Page 4 (Abridged)

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### Air Surveys of Future Bridge Sites

The air method of surveying bridge building sites was first used along the railway line Tyumen'-Surgut.

B.K. Malyavskiy, chief member of the research laboratory, Central Scientific-Research Institute of Transport Construction stated that prior to selecting the present route of this railway line, several others were studied. Seven possible bridge sites were surveyed.

There was no time left to study the river from the ground. Besides this is a difficult task as the river Ob' is 2.5 kilometers wide at normal time and reaches up to 40 km during floods.

Capsules and indicators filled with motor oil were dropped from an aircraft. The oil spread on the surface of the water and showed the direction of the currents. Other studies were made with the help of special instruments which gave the depth of the river, water debit etc.

Trud  
13 March 1966  
Page 4 (Abridged)

### New Fog Dispersing Method

A new method for the elimination of fog at sea has been devised by Dr. G. Prikhod'ko of the Kiev State University. His method involves the spreading of a thin liquid film on the surface of the water. This serves as a barrier for water evaporation which causes the fog.

L. Rayev, Candidate of Physical-Mathematical Sciences of the Ukrainian Hydro-Meteorological Institute developed the substance to serve as vapour barrier.

Tests were carried out in the Kola inlet with the help of the hydrometeorological vessel Raduga from Murmansk. The special substance was poured out of a small barrel. In about one hour an area with a radius of several hundred meters was completely free of fog. In a short time fog had disappeared over a distance of several kilometers.

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Although the new method proved superior to others, the first trials were not altogether satisfactory as fog was dispersed in small isolated areas or "channels". A second attempt proved more successful when the entire port area of Murmansk was cleared of dense fog.

Vodnyy Transport  
17 March 1966  
Page 4 (Abridged)

From the Dnepr to the Vilyuy

Large size transformers for the Vilyuy hydroelectric power station were transported on special flatcars from Zaporozh'ye where they had been manufactured to the port of Osetrovo on the Lena. From the latter port these gigantic transformers were moved by barge to the city of Lensk.

A special winter road had to be built with reinforced crossing points at the rivers Nyuya, Irelyakh and Botuobuy. Two such transformers, each weighting 180 tons were placed on special 20 metre long trailers. In order to move the two trailers, ten S-100 tractors were required.

A.P. Ryabov, chief engineer of the mechanization department of Vilyuygeststroy trust was in charge of this operation. The distance to be covered amounts to 430 kilometres. It will be a month before the transformers will be at destination.

Izvestiya  
29 March 1966  
Page 6 (Slightly abridged)

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SUPPLEMENT to  
JIB(CAN) \_\_\_\_\_ 9/66

DATE \_\_\_\_\_ March, 1966

# JOINT INTELLIGENCE BUREAU Ottawa

PROBLEMS IN THE DEVELOPMENT

OF THE PRODUCTIVE FORCES OF THE KAMCHATSKAYA OBLAST'

.....  
THE ACADEMY OF SCIENCES USSR PUBLISHING HOUSE  
MOSCOW, 1960

**JOINT INTELLIGENCE BUREAU**  
Department of National Defence  
**OTTAWA, CANADA**

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Supplement 1 to Extracts from  
the Soviet Press - March 1966

PROBLEMS IN THE DEVELOPMENT  
OF THE  
PRODUCTIVE FORCES  
OF THE  
KAMCHATSKAYA OBLAST'

THE ACADEMY OF SCIENCES USSR PUBLISHING HOUSE

MOSCOW 1960

## FOREWORD

This monograph gives an account of the stages in the economic investigations of the present state and ways of developing the National Economy of the Kamchatskaya Oblast' over a period of 10 to 15 years. The investigations were begun in 1955 and finished in 1957-1958.

The authors have striven to find ways for the most reasonable use of the natural resources of the Kamchatskaya Oblast', to determine correct solutions to the problems of composite development of the national economy, taking into consideration specific local conditions and technical reconstruction of all branches of the national economy, which, as a whole, must ensure a high standard of productivity of social labour. It must be understood that the projects suggested in this work are not planned proposals, but only hypotheses, a scientific prognosis based on the present level of knowledge of the natural resources and economy of the Oblast' and on an estimate of the present abilities of science and technology.

Great attention has been given to the problems of fundamental reconstruction of the fishing industry, which will remain a basic, main branch of the Kamchatskaya Oblast' economy for a long time to come, to determining its specialty in the inter-raion division of labour, as well to the problems of creating a composite of products commensurate with the conditions in Kamchatka, associated with the planned stages of development of the fishing industry and meeting the needs of the Oblast's population.

Scant knowledge of the natural resources of the Oblast', particularly its minerals, prevented a sufficiently sound development of the question concerning the extension of this specialization in the Oblast'. Only an economic estimate of the ways of possible use of natural resources of Kamchatka (besides the fishing resources) and those changes, which this would bring to the Oblast's economy, are given.

Materials from scientific-experimental, design, economic and planning organizations were used in the development of the hypotheses. These materials elucidate the present state of study of the natural resources and natural riches of the Kamchatskaya Oblast', the present state and dynamics of development of the national economy, designs for various projects, etc,

# INTRODUCTION

The Kamchatskaya Oblast' possesses sufficiently clearly expressed peculiarities in geographic position, natural conditions and developed economy to exert an influence on the future prospects for its economic development. It is an economic administrative raion situated on the most remote fringes of the Soviet Union. Being a peninsula, Kamchatka's economic outlook is "insular", since its economic ties are effected materially by massive transfer of freight by sea transport. There are no dry land transport communication ties with other sectors of the Soviet Union.

Kamchatka is a raion of unilateral economic development. Its specialty is utilization of the fish resources in the seas surrounding it. Kamchatka produces 9 to 10% of the total fish harvest of the USSR; it produces about 10% of the canned fish, about 70% of the canned salmon and 100% of the crab of the total production in the USSR. This determines the basic significance of Kamchatka in the national economy of the Soviet Union. Other natural resources of the Oblast' are practically not used and have been poorly studied.

The growth of productive forces in the Kamchatskaya Oblast' during the Soviet period is shown in Table I below.

TABLE I

## GROWTH INDICES, NATIONAL ECONOMY, KAMCHATKA OBLAST

Indices	Unit of Measurement	Year			
		1913	1940	1950	1957
Population .....	Thous. of persons	10.5	108		220
Fish Catch .....	Thous. of centners	784	799	1033	2535
Salmon .....	" "	No Info.	596	578	928
Total Industrial Output .....	Millions of rubles	No Info.	---	908	2087
Sown Areas .....	Thous. of hectares	0.07*	3.3	7.0	10.0
Head of Cattle.....	Thous. of head	3.6**	10.7	21.8	21.8
Number of Swine ...	" "	0.14***	17.6	8.6	16.8
Head of Reindeer ..	" "	No Info.	143.1	193.5	120.4

TABLE I continued:

Footnotes:       \*   1926/27 data  
                 \*\*   1914 data  
                 \*\*\*   Average for 1911-1915  
                 \*\*\*\*   Census data, 1959.

---

The growth of the economy was accompanied by considerable effort in the study of the natural conditions and riches of the Kamchatskaya Oblast'. The best studied, although not sufficiently so, are the fish resources, this is associated with the direct requirements of the fishing industry. Although the geology and minerals of the Oblast' have, on the whole, been poorly studied, considerable reserves of hard coal, peat, a number of sulphur deposits and various types of raw materials for production of building materials have been found, it has been established that there are present the necessary geological conditions for discovery of oil, mercury, copper, gold and other valuable minerals. The forests massifs of the Kamchatka river valley are being studied.

The enormous growth of the Kamchatskaya Oblast' economy is characterized, first of all, by its unilateral specialization (Table II on the following page) and, in the second place, by the disproportionate development of various branches of the economy. This has resulted in a number of discrepancies in the national economy of the Oblast'.

The fishing industry produces more than 80% of the gross output. Other branches of the economy also serve the fishing industry, so that taken together this branch provides 90% of the output, while that associated with meeting the needs of the rural economy, transport and population amounts to about 10% of the industrial output. Of the service branches, shipbuilding and ship repair has the greatest ratio (5.1%). However, much of the ship repair is done in the shipyards of the Primorskiy Kray and China.

According to state purchase prices, the agricultural output of the kolkhozes in Kamchatka for 1955 amounted to 82.5 million rubles. The value of agricultural output, including the production of the sovkhoses, amounts to about 100 to 120 million rubles, i.e., 5 to 6% of the value of industrial output.

The distribution of the different branches of the national economy in the Kamchatskaya Oblast' are shown in Figure I on page 5. The poor development of the branches of the economy which serve the fishing industry and the needs of the population results in the necessity for the overwhelming bulk of all types of products, as well as consumers goods, to be hauled in from other raions of the country. Six to seven tons of various freight are brought into Kamchatka in exchange for every ton of fish product which is exported from the Oblast'.



TABLE 2

BREAKDOWN OF TOTAL INDUSTRIAL OUTPUT, KAMCHATSKAYA OBLAST'

1957

Branch of Industry	Total Output	
	Mill. rubles	%
All branches of Industry.....	2087.2	100.0
Including:		
Fishing Industry .....	1676.2	80.3
Machine shops & Metal working		
by Trade: .....	158.1	7.6
Shipbuilding and Ship Repair .....	107.6	5.1
Lumbering .....	57.1	2.7
Local Industry .....	79.6	3.8
Building Materials .....	30.7	1.5
Electrical & Heat Energy .....	3.6	0.2
Others * .....	81.9	3.9

\* Includes all output of the trading industry.

Interbranch disproportions have arisen in Kamchatka as a result of the unilateral development of the productive forces. The greatest bottleneck in the national economy of the Oblast' is transportation, which is holding up development of all productive forces, including the leading branch of the economy, i.e., the fishing industry. The backwardness of transport results in disassociation of separate sectors of the territory and creates difficulty in utilization of its natural resources.

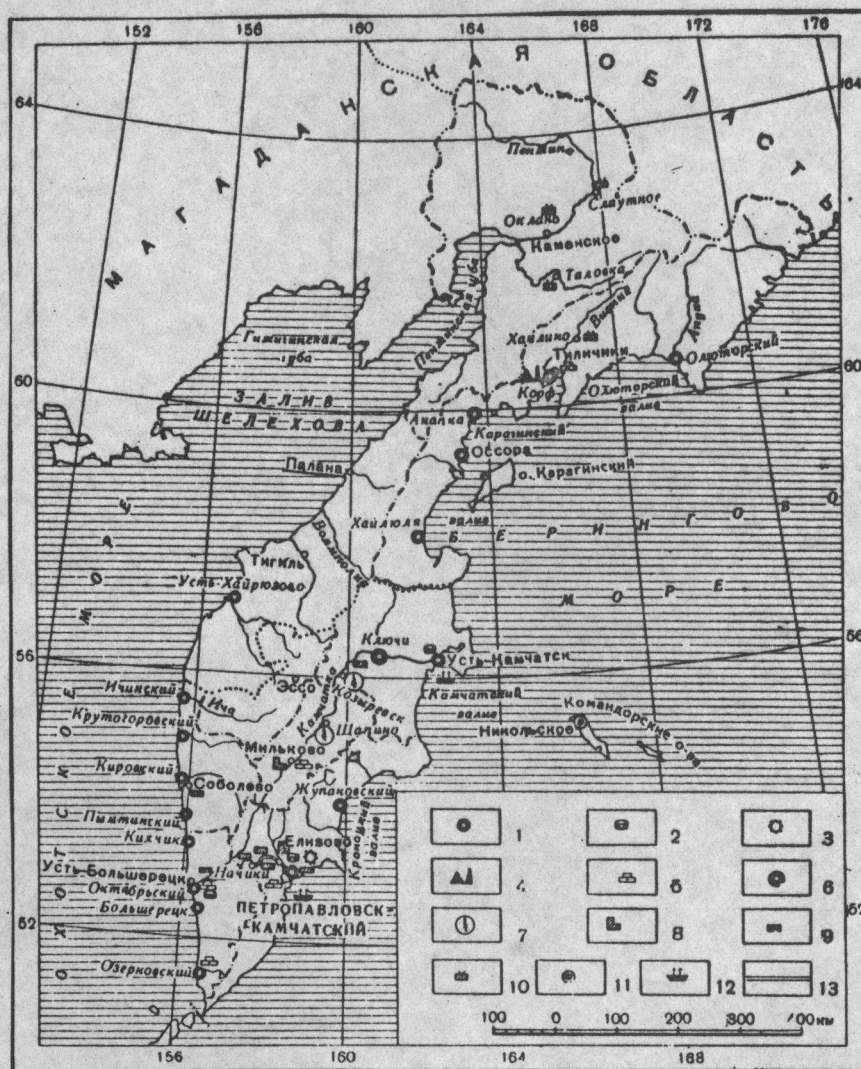
A number of discrepancies are to be found within the various branches of the economy, for example, within the fishing industry, which is one of the basic reasons for unfavourable indices in its operation.

The geographic position of one of the most remote outlying districts of the country, the harshness of the natural conditions and the sparseness of population in Kamchatka results, as it does in other sectors of the north, in an increase in cost of unit capital construction (2 to 3 times) and increase in the exploitation costs in comparison with the better populated and more favourably situated, from the point of view of natural and economic conditions, regions of the country. This directly influencing factor is delaying the economic conquest of the natural resources of Kamchatka. Its effect was felt particularly strongly during the initial stages of industrial development on the peninsula, which were the most difficult.

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Figure I

Economic Map, Kamchatskaya Oblast'



1. Rybokombinats

2. Tin-Car Shops

3. Machine Shops & Metal-Working Establishments

4. Coal Pits

5. Building Materials Establishments

6. Wood-Working

7. Lesopromkhozoes

8. Mountains

9. Milk-Vegetable Sovkhozoes

10. Reindeer Raising Sovkhozoes

11. Hunting Kombinats

12. Sea Ports

13. Auto Roads

Development of the salmon catch is associated with its higher quality and lower capital expenditures in comparison with active fishing for sea fish. (Active fishing may be considered as being carried on by organized fleets at sea, as opposed to individual fishing boats in inland waters and shore fish trans-note.)

The change to active fishing requires greater capital expenditures and larger initial costs per unit of output, than would be required for inshore fishing. As shall be shown below, active fishing is accompanied by fundamental reconstruction of all the fishing economy, by the creation of a large fishing and refrigeration fleet, construction of special fishing ports, large refrigeration plants and canning facilities; this is associated with expansion of fishing combines, the liquidation of many operation combines and with a considerable build-up of transport. It requires complete rebuilding of the national economy of the Oblast'. However, the change to active fishing in the Kamchatka Oblast', as in all the Far East, is long overdue.

With the reduction in salmon reserves and the decrease in inshore fishing, only active fishing can bring about an increase in the fish catch in Kamchatskaya waters. Besides this, the overall growth of the national economy of the country would permit the development of a large scale fishing industry in the Far East, which at the present time is the most promising fishing basin, in terms of its resources, in the country. As is well-known, active fishing is the most efficient type of fishing, and large capital expenditures are quickly recovered.

The problem concerning the composite development of the national economy of Kamchatka requires specialized consideration, and this will be done in the final chapter of this work.

## CHAPTER I

### NATURAL CONDITIONS AND RESOURCES

The Kamchatskaya Oblast' covers an extensive territory of 488,700 square kilometers, which stretches for 1600 miles from the southwest to the northeast; its width is approximately 450 kilometers in the peninsular part and more than 600 kilometers in the northern (continental part). The maritime position of the Kamchatskaya Oblast' has imprinted its clear stamp on the natural conditions and on the economic life of the peninsula.

The Kamchatska Oblast' is one of the most remote regions of the Soviet Union. The significant remoteness of the Oblast negatively influences the development of its productive forces. The Kamchatskaya Oblast' does not have land transportation ties with the All-Russian railway network, and communications are maintained by boat.

In spite of its comparatively southern position, the Kamchatskaya Oblast' climate is more rigorous, than the climate at the same latitudes of the European part of the USSR. This is conditioned, most of all, by the strong and prolonged effect of the great Asiatic (Siberian) maximum. At the same time, due to the influence of the Pacific Ocean, the climate in the southern sectors of Kamchatka is milder than the climate in some regions of the Far East which are situated even farther south, for example, the west coast of the Sea of Okhotsk.

The territory south of the 60th parallel of latitude relates to the zone of temperate climates; the northern sector enters into the subarctic zone. All of the Kamchatskaya Oblast' has a rigorous climate, which is manifested in low year-round temperatures, long winter and short summer, as well as in extreme ice conditions on the sea. The average yearly temperature in the north of the Oblast' is from  $-4^{\circ}$  to  $-6^{\circ}$ , in the south it is from  $0^{\circ}$  to  $+2^{\circ}$ ; the absolute minimum reaches  $-51^{\circ}$ , and the maximum  $+33^{\circ}$ . The winter lasts for 6 to 7 months and longer, while the summer lasts for  $2\frac{1}{2}$  to  $3\frac{1}{2}$  months.

The Kamchatka climate is of a monsoon character. In winter, cold dry winds blowing from the depths of the continent predominate over the territory, while in summer, humid winds blow in from the ocean. The winter monsoons are more pronounced than the summer monsoons. In many localities the wind velocity exceeds 4 to 8 meters per second; in the fall and winter gales, storms and typhoons occur frequently.

The intensive wind conditions create favourable conditions for widespread use of windmills in industry and the rural economy of the Oblast'. However, the wind energy is not used.

There are from 40 to 70 days with snow storms on the average per year in the eastern and western coastal areas of the peninsula, and in the valley of the Kamchatka river there are about 40 per year. This creates very difficult conditions for ground transport.

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The Kamchatka summer is cool, foggy and dull. The number of days with fog during the course of a year varies from 70 to 115 on the coasts, and from 30 to 40 in the Kamchatka river valley. The fogs occur mainly during the summer period. The relative humidity along the sea coast reaches 80 to 90% during the summer, and in the Kamchatka river valley it reaches about 50%; in winter the humidity drops somewhat.

Precipitation distribution over the territory increases from the north (500 to 550 millimeters) to the south (up to 1100 millimeters), and decreases somewhat in the Kamchatka river valley (350 to 450 millimeters). Precipitation occurs mainly from August through October (up to 70%). Snow stays for 180 to 210 days (from October-November through to May). Depth of snow cover reaches 70 to 100 centimeters (in March-April), while in the foothills areas it exceeds 240 centimeters.

The great extent of the Kamchatka Oblast' territory from north to south and its complex relief condition the climatic variations in separate areas against the background of a common monsoon climate.

The west coast relates to the Okhotsk monsoon area. This coast is subjected to the influence of the cold and dry winter monsoon. The winter is distinguished by its length. Frequent storms characterize the fall. The frost-free period does not exceed 85 to 100 days on the average. The climatic conditions of the southern half of the west coast permit the development of agriculture along vegetable growing and stock raising lines.

The east coast is a part of the Pacific Ocean monsoon area. It is affected by the summer monsoon, the winter northeastern cyclones and the waters of the Pacific Ocean. The winter here is relatively warm: the average monthly temperatures during the coldest months (January and February) come to  $-10^{\circ}$  to  $-12^{\circ}$  in the north of the raion and from  $-4^{\circ}$  to  $-8^{\circ}$  in the south. Westerly winds predominate during the winter, there are many gales and snow storms, cyclones pass frequently; the weather is distinguished by its instability.

The summer is cool, foggy and rainy. Average temperature during the warmest months, July and August, do not exceed  $10^{\circ}$  to  $14^{\circ}$ . The frost-free period amounts to 100 to 110 days on the average in the north (vicinity of the settlement of Tilichiki to the Bay of Karaga) and 140 to 150 days in the south (vicinity of the city of Petropavlosk to Cape Lopatka).

Climatic conditions in the southeastern coastal area of Kamchatka, in comparison with other sectors, favours raising of potatoes, vegetables and livestock.

In the Kamchatka river valley, protected as it is from the influence of ocean winds by mountain ranges, the climate is dry and continental in comparison with the coastal raions. The winter here has little snow, with extreme frost; the summer is hot and dry and the spring comes earlier. The average temperature for January in the village of Mil'kovo equals  $-25^{\circ}$ , that of July is  $+16^{\circ}$ . This raion has the most suitable conditions for development of grain growing, fodder crops and livestock raising.

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The northern (continental) part of the Kamchatskaya Oblast' relates to the subarctic Pacific ocean weather area. It is characterized by more rigorous and lengthy (in excess of 7 months). winters. The absolute minimum here reaches  $-51.7^{\circ}$ , the average January temperature is from  $-24^{\circ}$  to  $-26^{\circ}$ .

The summer is very short (2 to 2.5 months); temperatures in July rise to  $+14^{\circ}$  and  $+16^{\circ}$ . The whole raion has a negative yearly average temperature, it reaches  $-3^{\circ}$  to  $-6^{\circ}$ .

Strong winds predominate the year around, the average yearly wind velocity equals 8 to 9 meters per second. Prolonged snow storms occur throughout the raion, frequently these turn into blizzards.

On the whole, the Kamchatskaya Oblast' climate is characterized by negative yearly average temperature over a large portion of its territory, lengthy winters and short summers, short duration of the frost-free period, snow storms and blizzards, strong winds and gales, along with considerable ice on the seas.

The predominance of unfavourable climatic conditions in Kamchatka requires an increased expenditure of overall labour in the construction of various establishments, on the provision for normal functioning of transport in conditions of storm, gale, drifting snow, as well as ice on the oceans and protection of agricultural crops from the effect of low temperatures and abrupt changes in weather during the vegetation period.

The southeastern and southwestern seacoast of the peninsula, as well as the Kamchatka river valley, are relatively favourable from a climatic point of view in relation to the other Kamchatskaya Oblast' raions. These are the best developed sectors of Kamchatka, in an economic sense, and the bulk of the population is concentrated in these sectors.

The overall rigor of the climate influence the ice conditions on the Bering and Okhotsk seas, particularly on the latter, which is submitted to a more severe effect from the Siberian maximum than is the former; the southern part of the Bering Sea is covered by the Aleutian depression, which has a moderating effect on the climate. The lesser icing conditions on the Bering Sea, in comparison with the Sea of Okhotsk, is also associated with the approach of a more significant amount of warm Pacific Ocean water. The Sea of Okhotsk is completely covered with ice for 3 months of the year, while the southern regions of the Bering Sea remain open the year round.

The penetration, by warm Pacific Ocean water, into the Okhotsk and Bering Seas forces the ice to the north, which explains the characteristic concavity of the edge of floating ice in both these basins. At the same time the cold currents known as the "Anadyarskoe" and "Penzhinskoe" favour the advance of the ice edge deep into the south.



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On their headwaters the rivers of western Kamchatka flow through narrow gorges with numerous rapids and waterfalls, while in the level areas the valleys become wider (up to 5 and 6 kilometers), the banks become low, the current slow. Here the rivers meander a great deal, forming many channels which abound in sand bars. Outstanding rivers in western Kamchatka are: Bolshaya, Vorovskaya, Krutogorova, Icha, Tigil' and the Penzhina.

Most of the rivers in the eastern half of Kamchatka are even shorter than the rivers in the western half; many of these rivers have a clearly expressed mountain character throughout their length, right down to the estuaries. Of these rivers, those outstanding in size and significance are: the Avacha, Vivnick, Pakhacha, and Apuka.

The most important river in the Oblast' is the Kamchatka. Its length is about 700 kilometers, the area of its watershed is about 56,400 square kilometers. It flows through the central Kamchatka depression between the Sredinnyy and Vostochnyy Khrebets. Having cut through the Kumroch Khrebet (this sector is called the "Shcheki") by means of a narrow channel, the river then flows into the Kamchatskiy Zaliv of the Pacific Ocean. The river freezes over in October and opens up at the end of April, beginning of May. The most important of its many tributaries is the Yelovka which is navigable to cutters.

The Kamchatka river is the most important transport artery in the Oblast'; it is navigable almost to the village of Mil'kovo. The transportation importance of the remaining rivers in the Oblast' is small in comparison with the Kamchatka river: they have many bars and portages, they are accessible to cutter navigation only on their lower currents. Such rivers are the Bolshaya, Vorovskaya, Krutogorovaya, Icha, Tigil', Penzhina, Avacha, Pakhacha, Vivnik and Apuka. Lagoons are normally formed at the estuaries of the rivers in this Oblast'. These fulfill an important role as shelters for the small trading boats servicing the rybokombinats. The Kamchatskaya rivers serve as magnificent spawning grounds for salmon and are of exceptional importance in the development of the fishing economy of the Oblast'.

The characteristics of the Kamchatka rivers are also favourable from the energy point of view. Their great number, abundance of water and mountain nature of the current (mainly at the headwaters) with a plenitude of "Shchek" (gorges) all this creates a very favourable situation for the construction of hydroelectric power stations. The Far East branch of the Academy of Sciences USSR has estimated that the total potential power reserve of the Kamchatskaya rivers is in the neighbourhood of 12 to 15 million kilowatts.

The city of Petropavlosk, a large transport-industrial center and consumer of electrical energy, has two rivers near it, the Bystraya and the Zhupanova, which have favourable conditions for production of electrical energy. Hydroelectric stations of small capacity can also be built on the Avacha and Paratunka rivers.

The salmon spawning function of many of the rivers is threatened by the development of electrical energy resources.

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Lakes are widespread throughout Kamchatka, among them are many of volcanic origin. Two of these are the Lake Kurilskoye (depth of 306 meters) and Kronotskoye (depth of 128 meters). The extended lakes Nerpich'e and Kultuchnoye are situated in the vicinity of the Kamchatka river estuary and are separated from the sea by sand bars. The large lakes Palanskoye, Talovskoye and Pilgun and many smaller ones are situated in the north of the Oblast'. Kamchatka lakes are rich in fish; some of them serve as spawning grounds for salmon (Kurilskoye, Nerpich'e and Kultuchnoye among others).

Kamchatka is a land of volcanoes, geysers, and a variety of springs. Volcanoes, thermal and mineral springs are widely distributed over its territory, particularly in the eastern, volcanic region. The origin of the springs is associated with the manifestation of volcanic activity. The best known of these are: Paratunskiye, Nachikinskiye, Pauzhetskiye, Bannyye, Shchapinskiye and other springs. Geysers have been found along the east coast of Kamchatka in Geyser valley).

Kamchatka has favourable possibilities for the use of natural steam and thermal waters for energy purposes. At the present time experimental boreholes are being put down at the Pauzhetskiye Springs. On the basis of data thus obtained, a project has been developed for the construction of the first geothermal-electro power station in the Soviet Union.

The soils in Kamchatka are divided into three basic groups: eluvial, gleisolic-boggy, and alluvial.

In the agricultural sense the most important are the eluvial soils: the soddy-meadow, soddy-podzolic (weakly podzolized) soils which are widely used at the present time for field and potato-vegetable crops. In the mountain areas (on the steep slopes and plateaus), mountain-forest, mountain-meadow and mountain-tundra soils are developing, these are overgrown with alder, brown cedar, alpine and sub-alpine meadows or with high-mountain tundra. They serve as pastures for reindeer and mountain goats.

Of the Kamchatskaya Oblast's vegetation resources, those of greatest economic value are the forests, meadows and the tundra. Forests take up 20954.5 thousands hectares of the Kamchatskaya Oblast' territory, of these, timber occupies 38.7%, brush 52.2%, and 9.1% is cut over and slash. The treeless area makes up 24044.6 thousands hectares. The distribution of forests by species is shown in Table III on the following page.

The density of Kamchatka's forests in general is not great. The high percentage of faulting in the timber, up to 35%, results in the per hectare forest reserves of Kamchatka averaging out at 87 cubic meters, as against 106 cubic meters in Archangel and 137 cubic meters in the Sakhalin Oblast'.



TABLE III

DISTRIBUTION OF FORESTED AREAS BY SPECIES \*

Area, Species	Thous. of hectares	Species, % of growth
Total Forested Area (Not incl. scrub, slash, cut-over) .....	19029.4	-----
(a) Wooded .....	8106.7	100.0
By species: Larch: .....	1045.0	12.8
Spruce .....	163.2	2.0
Rock Birch .....	5602.6	69.3
Chinese Birch .....	710.8	8.7
Other .....	585.1	7.2
(b) Shrubbery .....	10922.7	100.0
By species: Ground cedar .....	7326.6	6.70
Alder .....	3137.9	28.7
Other .....	458.2	4.3

\* Reports of the Leningrad Air Survey of Kamchatka Forests, 1955, Leningrad,  
1956.

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TABLE IV

DISTRIBUTION OF FORESTS IN THE KAMCHATSKAYA OBLAST' BY

MAIN SPECIES & GROWTH (1956) \*

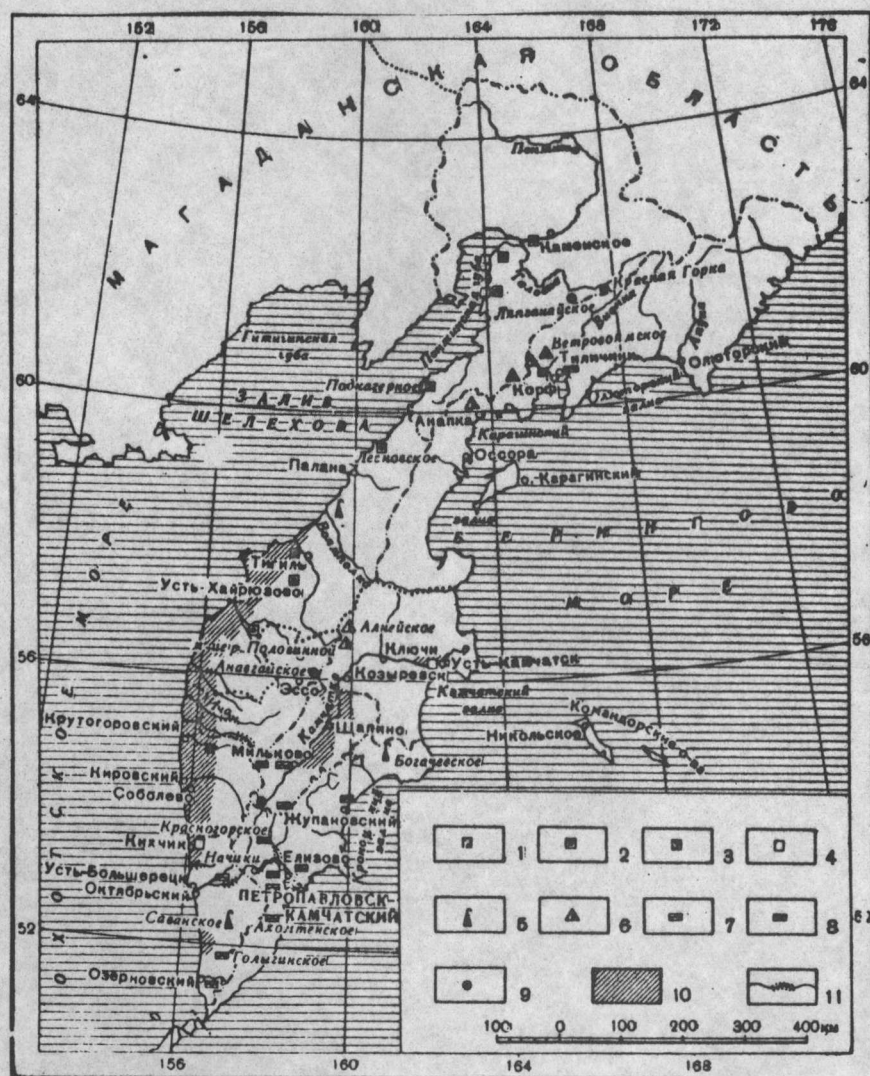
Designation	Millions of Cubic meters	%
Overall Reserves, Total .....	924.5	100.0
By Main Species:		
Coniferous .....	150.6	16.3
Deciduous .....	773.9	83.7
Plantations By Maturity:		
New Growth .....	90.6	9.8
By species: Coniferous .....	9.3	1.0
Semi-Matured .....	51.4	5.6
Coniferous .....	7.2	0.8
Maturing .....	96.0	10.4
Coniferous .....	24.0	2.6
Mature & Aged .....	686.5	74.2
Coniferous .....	110.1	10.8

\* Forest-industry, Stat. Review, Gosles by Mizdat, 1957.

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Figure 2

Pictograph of Minerals in the Kamchatskaya Oblast'



Deposits:

- |                             |                                    |
|-----------------------------|------------------------------------|
| 1. Coal, surveyed           | 7. Building Materials              |
| 2. Coal, not surveyed       | 8. Copper                          |
| 3. Brown Coal, surveyed     | 9. Mercury                         |
| 4. Brown Coal, not surveyed | 10. Main Feat Deposits             |
| 5. Oil                      | 11. Gold-Bearing Sectors of Rivers |
| 6. Sulphur                  |                                    |

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Proceeding from the combination of geographic conditions, raw resources and industrial potential which the Kamchatskaya Oblast' possesses for the development of the national economy, its territory may be divided into the following natural-economic raions.

1. Zapadno-Kamchatskiy
2. Yugo-Vostochniy
3. Tsentral'no-Kamchatskiy
4. Karaginsko-Olyutarskiy
5. Penzhinskiy.

1. Zapadno-Kamchatskiy raion encompasses the coastal lowland and the "Sredinnyy Khrebet", mainly its western sector.

The Zapadno-Kamchatskiy lowland stretches along the Sea of Okhotsk for 800 kilometers and is 80 to 100 kilometers in width. It is dissected by numerous rivers and is very swampy, this makes road building difficult.

The coastline here is distinguished by its exceptional flatness and it does not have natural shelter for shipping; there are no ports. This situation complicates the sea approach to the raion, due to the particularly severe storms and ice conditions on the Sea of Okhotsk.

Land transport communications with the Zapadno-Kamchatskiy raion are obstructed by the Sredinnyy Khrebet, which is of from 1500 to 2000 meters in height and extends along the whole length of the peninsula from the Plotnikovaya river on the south to the Parapol'skiy Dale in the north.

This raion's climatic conditions permit the growing of early vegetables, potatoes and fodder crops. The rich grassy growth favours the development of livestock raising.

Both the depths of the earth and the coastal waters of this raion are rich in resources. Basically these are fish resources. Western Kamchatka rivers serve as spawning grounds for salmon. Large combines, such as the Ozernovskiy, Oktyabr'skiy, Kirovskiy and others engage in catching these fish. Along western Kamchatka's shores lie great flounder banks, crab beds and congregations of cisco. Western Kamchatka, and especially its southern sector, is the most important fishing industry raion in the Oblast.

Although it has been poorly studied, geological data indicate that western Kamchatka is rich in a variety of useful minerals. Most of the coal deposits are concentrated here, including the Krutogorskoye, Tigil'skoye and others. Peat deposits occur everywhere. Enormous reserves of pumice occur along the Golyginaya, Ozernaya and Khodutkaya rivers, this is of great importance in connection with the lack of building timber in western Kamchatka. Oil prospects are good in western Kamchatka. Many of the rivers are gold-bearing. A variety of ore strikes have been made in the Sredinnyy Khrebet.

There is great promise of metallic minerals being discovered in western Kamchatka. The southern part of the Sredinnyy Khrebet, with its ancient rocks, refers to an ore zone which is prospective in relation to gold and molybdenum as well as other valuable minerals. A zone of secondary quartzites extends through the central and northern sectors of the Sredinnyy Khrebet, this zone is characterized by traces of mercury, gold, barium and sulphur. Of the other resources of western Kamchatka, mention must be made of the numerous volcanic sources of heat (in the Ozernovskiy raion).

Natural conditions and resources make it possible to further develop the Zapadno-Kamchatskiy raion not only in terms of the fishing industry, but in the development of other branches of the economy, i.e., coal mining, peat cutting, construction materials, possibly oil, as well as development of underground heat. Climatic conditions permit the development of agriculture in the southern sector of this raion.

Transportation difficulties, caused by natural conditions, must be overcome by means of overland roads and by construction of ports.

2. Yugo-Vostochniy raion occupies the eastern half of the peninsula and includes the Vostochnyy Khrebet and the neighbouring volcanic highland.

A predominance of volcanic relief, volcanic cones and lava plateaus is characteristic of the raion. Mountainous formations come right down to the ocean in a number of sectors, particularly to the south of Petropavlovsk, thus blocking the approach to the interior.

The eastern coasts are dissected by deep bays and have a number of suitable inlets, particularly in the Avachinskaya Guba. A plenitude of inlets and relatively favourable shipping conditions, permitting year round navigation, facilitate sea communications along the coast. However, the value of many of the inlets, surrounded by mountains, is reduced due to the absence of communications with the interior sectors of the raion. An exception is the Avachinskaya Guba, which is connected with adjacent territory by auto road.

The climate in the Yugo-Vostochniy raion is temperate, with excessive humidity. The soil-climatic data for the raion are more favourable than for the Zapadno-Kamchatskiy raion, these permit the growing of early and medium-late varieties of potatoes, vegetables, fodder and some grain crops. The raion also has favourable conditions for development of livestock raising.

The Pacific Ocean waters washing the shores of the Yugo-Vostochniy raion are rich in fish, i.e., flounder, pollock, cod and cisco. These are caught mainly by boats of the active fleet.

Of the mineral resources, the construction materials of volcanic origin are outstanding; these are: pumice, tuff, granite, andesite, basalt, perlite and others. Many deposits of native sulphur of the crater-type have been found. Ore traces, particularly of copper ore, are widespread.

The raion has prospects for oil (Bogachevskaya area) and metallic minerals. It lies in the Vostochno-Kamchatskaya ore zones, in the metallurgy of which copper, nickel, chromium and other metals are particularly important.

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The Yugo-Vostochnyy raion is rich in hydro resources, volcanic heat and mineral springs. In the economic sense the central part of the raion, including Petropavlovsk and adjacent territory, is best developed. Petropavlovsk has grown into the great transport-industrial center of the Oblast'. The freight and fishing ports are situated here; shipbuilding and ship repair, fish and food branches of industry and light industry have been developed here.

A number of establishments producing construction materials based on the use of clay, andesites and volcanic tuffs are operating in the town and in its environs. Agriculture has been developed around Petropavlovsk. As for the other sectors of the Yugo-Vostochnyy raion, they have been developed very little.

The main future prospects of the Yugo-Vostochnyy raion are associated with development of fish resources on the open sea.

A plenitude of raw construction materials assures considerable growth of this industry in the raion. Natural conditions permit the extension of production of potatoes, vegetables, milk and meat for the growing population of the Petropavlovsk and the raion.

The industrial potential of the Yugo-Vostochnyy raion is also dependent on the favourable geological prospects for oil, and metals (copper, nickel and chromium), as well as volcanic heat.

3. The Tsentral'no-Kamchatskiy raion includes the Kamchatka river valley. The raion is cut off from the sea by the Sredinnyy and Vostochnyy Khrebets, as a result of this it is in an isolated position. Internal transport connections are made along the Kamchatka river, while external connections are made through the port of Ust'-Kamchatsk. The manner in which this raion is sheltered from maritime influences conditions the continental nature of its climate. It is moderately warm with generally sufficient moisture, but the first half of the summer is dry. In terms of climate and soil this raion is one of the best in the Oblast'. It is possible to raise early and middle-ripening varieties of potatoes, vegetables, fodder and grain crops (barley, oats, fall rye and spring wheat) on its territory. The raion has rich possibilities for development of livestock raising.

The forests in the Kamchatka river valley have much industrial significance and are of great value to the national economy of the Oblast'.

Deposits of peat and building materials as well as mineral springs are known to exist within the borders of the raion. According to geologists, the Kamchatka river valley has prospects for oil and gas. Further development of the Tsentral'no-Kamchatskiy raion economy is connected with the use and development of forest and agricultural resources and with extension of its transportation ties with other sectors of Kamchatka.

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The Karaginsko-Olyutorskiy raion joins the territories of Koryakskiy Nagor'ye and the coastal sectors of the Olyutorskiy and Karaginskiy Zaliva. The terrain is mainly mountainous, the heights of the ranges reach 2000 meters.

The coastline is dissected by deep bays and inlets of the lagoon and fiord type in a number of sectors. Some of these (Siber', Yuzhnaya Glubokaya) allow transport and industrial shipping to take shelter to them during the frequent storms. Ice conditions in the Bering Sea limit the period of navigation along the Karaginskiy-Olyutorskiy raions shoreline to 5 to 7 months.

The raion's climate, particularly in its northern sector, is cold with excessive humidity. The soil-climatic conditions of the raion permit growing of at least the earliest types of vegetables, potatoes and fodder crops. A plenitude of extensive pastures favours development of reindeer herding.

The main riches of this raion are its resources of cisco and salmon fish. Fishing is carried out by the combines and by expeditionary boats. The largest rybokombinats are the Anapkinskiy, Ossorskiy, Korfskiy and Olyutorskiy.

The depths of this raion have been poorly explored. Brown coal deposits are being worked on the Korfa Zaliv. Geologists have found zones of distribution of sulphur and mercury in the Koryakskiy Khrebet, and series of deposits of these minerals have been discovered. Oil traces occur in the coastal areas of the Karaginskiy and Olyutorskiy Zalivs. The fur wealth of the raion is considerable. Sable is the most valuable of the tradeable animals.

The economy of this raion is based on the utilization of its fish and fur wealth and the development of reindeer herding. The specialization of the raion may be extended by exploitation of the mercury, sulphur and other mineral deposits.

The Penzhinskiy raion includes the Penzhinskaya lowland, Parapol'skiy Dale and a number of khrebets (Ichigmaskiy and others). Low-lying terrain predominates, only the western sector of the raion is mountainous. The approaches to the raion are very limited. Because of ice conditions, navigation in the Penzhinskiy Guba is of very short duration. Communications are maintained mainly by means of aircraft. Sled transport has preserved very great significance.

The territory of the raion to the north of the 60th parallel of latitude has a negative yearly average temperature. The climate is characterized by its rigor in the depths of the raion and its moderation on the coasts. The frost-free period lasts for no more than 47 to 65 days. Climatic and soil conditions permit the growing of early varieties of potatoes, vegetables and fodder crops.

Geologically, the territory has been very poorly explored. Fossil coal deposits are known along the coast of the Penzhinskaya Guba. Future prospects for this raion are associated with utilization of its fur wealth and the vegetation resources of pastures for development of hunting and reindeer raising.

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In summary, the following conclusions may be drawn:

1. A plenitude of diverse riches favours the possibility for composite development of the national economy of Kamchatka. However, the level of knowledge about practically all its natural resources is very low.

At the present time, use is made mainly of the riches of the sea: fish, crab and whales; forest reserves are being exploited and small scale development of some building materials resources is being carried on.

2. Future composite development of the Kamchatka economy is associated with the utilization of coal resources, oil (in the event of discovery of oil deposits in industrial quantities); energy of its rivers and of wind, and the large reserves of volcanic heat.

3. The Oblast' has great possibilities for development of industrial building materials, which are being brought in from elsewhere at the present time. The ore resources permit the organization of production of many building materials locally, i.e., wall-blocks, decorative tile and cement. Timber reserves assure a considerable increase in lumbering and the extension of the woodworking industry in the Oblast'.

## CHAPTER II

### THE FISHING INDUSTRY

#### 1. The fishing industry of the Far East basin and its peculiarities.

The total volume of fish and marine animals taken in the Far East basin reached 3.2 million centners in 1940, in 1950 it was 4.8 million centners, while in 1957 and 1958 it amounted to 8.2 and 8.5 million centners. In 1958, the pre-revolution level was exceeded by nearly 8 times, while the pre-war (1940) level was exceeded by 2.7 times, this was at a time when in the USSR as a whole, the 1958 catch exceeded the pre-revolution by less than 3 times.

In the 5th five-year period the fishing industry of the USSR increased its catch of fish and other items of the trade from 20.3 million centners in 1951 to 27.2 million centners in 1955. Catches in the Far East basin during this time remained without essential changes, (see Figure 3). It was only in 1957 and 1958 that the catch of fish and other of the industry's objectives in the Far East exceeded 8 million centners, while the specific ration approached 30% of the total catch for the USSR.



Figure 3

DYNAMICS OF FISHING & OTHER MARITIME PRODUCTS

(million of centners)

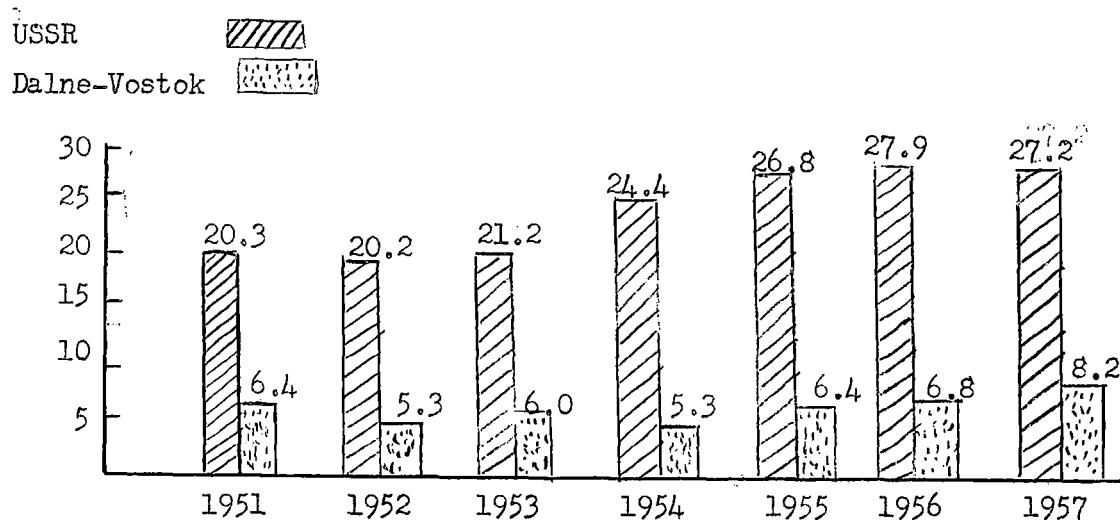


TABLE 6

CRAB CATCH & PROCESSING OF CANNED CRAB IN THE DALNE-VOSTOK \*

Indices	Unit of Measure	Years						
		1940	1946	1950	1955	1956	1957	1958(plan)
Crab Catch	Thousand Centners	138.5	59.2	222.9	374.0	360.0	297.8	296.0
Canned Crab	Millions of Cans	9.2	3.1	13.1	20.6	21.5	17.5	18.2

\* From census figures of the former Ministry of Fisheries, USSR.

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Unfavourable changes in the condition of the raw material resources in the Barents Sea, in particular the absence of takeable schools of cod, which make up the main catch, and the associated reduction in average catch of fish per trawler from 35 to 36 thousand centners in the 5th five-year period to 14 thousand centners in 1957, as well as the negative prognosis for the improvement of conditions in the raw materials base in the near future correspondingly increase the significance of the fishing industry in the Far East.

Development of the fishing industry in the Far East has come about and will continue to progress in the future mainly at the expense of the raw resources of the Okhotsk and the Bering Seas. These seas produce about 80 to 90% of the total catch of marine raw material, and while their specific ratio in the total catch in the Far East basin tends to increase, the specific ratio for the Sea of Japan tends to decrease.

There has been a considerable increase in the cisco catches during the recent years, mainly on the Sakhalino-Hokkaido, Okhotsk and Kamchatka shoals.

The Dalne-Vostock was the main source of cisco for the Soviet Union during the last five-year period, it produced, on the average 1,300 thousand centners of cisco per year. Its ratio comprises 67% of the total cisco catch.

The Dalne-Vostochnyy Basin's production of cisco dropped sharply during 1955 and 1956, in connection with the reduction in numbers of Sakhalino-Hokkaido and Okhotsk cisco as well as with the development of cisco fishing in the northern Atlantic. In 1957, however, when the cisco catch in the Dalne-Vostok reached 3 million centners, the ratio again grew to 43% of the total cisco catch in the USSR.

It must be noted that the cod catch in 1957, although it was considerably greater than the 1940 catch, was nonetheless lower than the cod catch in 1930. This indicates poor utilization of the reserve. Insofar as pollock is concerned, the catches, in spite of the increase, are small in comparison with the earlier catches and are far from the level of possible catch.

The world's largest crab beds are located in the Okhotsk and Bering Seas, while the west coast of Kamchatka is the main crab hunting ground. The crab catch approached 400,000 centners for 1955-1956, while the production of canned crab exceeded 20 million cans per year, (note Table 6). Since 1957 the situation has changed. The crab catch and processing of canned crab decreased, this is accounted for by the renewal of intensive fishing by the Japanese in 1955.

The Dalne-Vostochnyy basin is the only crab producer in the USSR; 95 to 98% of the crab catch and production of canned crab comes from the Sea of Okhotsk, in particular, from the western coast of Kamchatka, where the Primorskiy crab fishers operate and the coastal crab canning establishments are located.

Kamchatka is not only the center of the Soviet crab industry but since also of the world crab industry. More than 80% of the world canned crab product is processed from Kamchatka crab (USSR and Japan), it is the best raw material for production of canned crab meat.

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In terms of the absolute gross production of whale blubber in the Dalne-Vostochnyy basin during 1951 to 1958, the ratio of the whaling industry for the basin has grown only slightly over the 1951 level, this is accounted for by the successful development of the whaling industry in the antarctic.

TABLE 7

TAKE OF WHALE BLUBBER IN THE DALNE-VOSTOCHNYY BASIN

(thous. of tons)\*

Year	Take of Whale blubber	Ratio in the total take of whale blubber, USSR, %
1951	12.2	39.0
1952	14.4	37.0
1953	14.4	36.0
1954	14.0	32.8
1955	15.0	35.0
1956	17.0	41.7
1957	13.3	---
1958 (plan)	16.9	41.2

\* Census data, Dal'kitzvertest, Former Ministry of Fisheries, USSR.

Of the algae, sea kale is the most important. According to data from experiments conducted by the Pacific Ocean Scientific-Experimental Institute of the Fishing Economy and Oceanography, sea kale may be widely used for food, fodder and technical purposes.

The Institute estimates that organization and utilization of sea kale for food, fodder and technical purposes will ensure a market of 250,000 centners yearly for this algae within the next 10 to 15 years.

During the Soviet period there has been a basic increase in the variety of fish caught as well as an increase in the total catch: cod, flounder, sardine, crab, whale and many others are now new fishing targets in the Far Eastern waters. The variety of fish and other items of trade for the Dalne-Vostochnyy Basin are shown in Table 8 on the following page.

TABLE 8

VARIETY OF CATCH IN THE DALNE-VOSTOCHNYY BASIN

(Thous. of centners)

Item	Year			
	1913	1940	1955	1957
Salmon *	954.0	1143.8	1724.2	1508.0
Herring	67.0	500.0	1359.3	2965.4
Cod	---	112.7	466.6	446.7
Flounder	---	35.2	1192.8	1374.2
Small Fey	49.0	120.3	367.3	321.0
Sturgeon	2.0	1.8	2.2	2.6
Sardine	---	903.8	---	---
Other	---	13.2	19.1	178.3
Crab	---	139.8	374.2	297.8
Whale	---	114.7	788.3	956.8
Maritime Animal	---	3.7	68.7	74.0
Non-Fish	---	4.2	43.5	32.0
	1072.0	3093.4	6402.2	8156.8

\* Less Japanese catch in conventional waters.

The geographic distribution of the fish industry in the Dalne-Vostok is given in Table 9.

Judging from these figures, it may be concluded that the main fishing industry raion in the Dalne-Vostok is the Primorskiy, with a ratio of 36.8%. Actually, this is not so. If one extracts the figures for the whale, crab, sea animals and fish catch taken in the vicinity of Kamchatka by the Primor'ya and Sakhalin fleets from their total figures, then the Kamchatka ratio will increase to nearly 45%. This means that the main fishing raion in the Dalne-Vostochnyy basin is Kamchatka.

Increased use of technical equipment by the fishing industry in the Dalne-Vostok and the limiting of catches in the coastal zones are reflected in the relative takes of fish and other items of the trade by the passive and active means of fishing (see Table 10, on the following page.)

However, this only compensated for the decreased catch in the coastal trade and did not change the overall picture. The situation did not essentially change in 1956. Reasons for this phenomenon are the following:

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TABLE 9

TAKE OF FISH & OTHER ITEMS OF THE TRADE IN THE RAIONS  
OF THE DALNE-VOSTOCHNYY BASIN

Raion *	Take in million centners	Take %
Primorskiy (incl. Magadan)	19.0	36.8
Kamchatskiy	15.4	30.0
Sakhalino-Kuril'skiy	10.4	20.1
Okhotsko-Amurskiy	6.8	13.1
Total	51.6	100.0

\* Within the sphere of activity of the Glavkov of the former Ministry of Fisheries, USSR.

TABLE 10

DYNAMICS OF FISHING & OTHER ITEMS OF THE TRADE,  
USING INSHORE TACKLE & FOR THE FISHING FLEET

(1951 - 1965)

Year	Take				
	Inshore Tackle		Fleet		
	Millions of Centners	% of 1951	Millions of Centners	% of 1951	% of the total volume of take
1951	4.5	100	1.9	100	30
1952	3.0	67	2.3	121	43
1953	3.6	80	2.4	126	40
1954	2.6	58	2.7	142	51
1955	3.0	67	3.4	179	53
1956	2.6	58	4.2	221	62
1957	3.3	73	4.9	258	60
1958 (plan)	2.4	53	5.6	295	70
1965 (project)	2.7	60	11.6	610	81

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a) Unfavourable changes in the conditions of the Sakhalino-Hokkaido and Okhotsk shoals of herring, the developing of large scale Japanese fishing for salmon in the northwestern Pacific Ocean.

b) Scant knowledge concerning the items for active catch and the incompleteness of prognoses given by scientific organizations to the fishing industry;

c) The low level of development of the active fishing trade, this refers to the small number of boats and the improper utilization of these, which in turn was conditioned by the lack of fishing ports and shortage of qualified personnel.

During the period 1951 to 1955, the Dalne-Vostochnyy fishing fleet increased by 55% in numbers and by 72% in size. As can be seen from Table 11 on the following page, it is not being exploited satisfactorily.

None of the types of boats in the Dalne-Vostochnyy Basin compared in performance to boats in other basins, particularly the Murmansk basin.

Sea duty by large and medium-sized trawlers of the Murmansk fleet is approximately  $1\frac{1}{2}$  to 2 times greater than that of the Dalne-Vostochnyy trawlers, while the duration of actual work with fishing equipment is 2 and 3 times greater than that of the Dalne-Vostochnyy boats, although in both cases it may be possible to ply the trade the year around. Approximately the same situation exists for boats of other types, in particular fishing seiners of 300 hp.

There has been little change in the situation in recent years (1956 to 1958). The main reasons for the unsatisfactory exploitation of the fishing fleet in the Far East is the lack of proper port facilities and processing equipment for the raw fish.

In catch per fisherman, the Dalne-Vostochnyy basin is second only to the Severnyy Basin, where there is a highly efficient trawler fleet, while in catch per fisherman it occupies first place among the fishing basins of the country. In spite of this the total output per worker in the Dalne-Vostochnyy basin is approximately  $1/3$  lower than the average for the fishing industry of the USSR.

One of the main reasons for this is the unfavourable structural balance in labour, which is characterized by the sharp predominance of workers in the subsidiary-auxiliary industries (with low output) over the workers in the primary industry (Figure 4, following page). The ratio of workers in the subsidiary-auxiliary establishments in the Far East is roughly  $2/3$  of the total number of workers as against  $1/3$  for the majority of fishing basins in the country.

A somewhat different situation is characteristic for the Dalne-Vostochnyy Basin in terms of the coast of extracting the raw material (Table 12, page 27).

TABLE 11

BASIC INDICES OF THE USE OF THE SAME TYPES OF BOATS

IN VARIOUS FISHING BASINS

- (in % of calendar time) for 1955 & 1957 -

Type of Boat	Raion	Sea Duty		Time Spent in Fishing	
		1955	1957	1955	1957
Large Trawlers	Murmanskiy	59.6	57.4	40.0	34.7
" "	Kamchatskiy	31.5	---	15.9	---
Medium Trawlers	Murmanskiy	63.8	64.0	46.8	48.0
" "	Kamchatskiy	46.5	50.0	23.1	24.0
" "	Primor'ya	43.6	65.2	13.5	27.2
" "	Sakhalin	36.6	46.8	20.5	18.3
Seiners - 300	Murmanskiy	43.3	42.2	27.5	30.2
" "	Primor'ya	38.4	41.3	13.9	13.1
" "	Sakhalin	36.7	44.9	20.8	18.3

Figure 4

NUMBERS OF WORKERS IN PRIMARY & SUBSIDIARY

INDUSTRIES IN % AT THE BEGINNING OF 1957

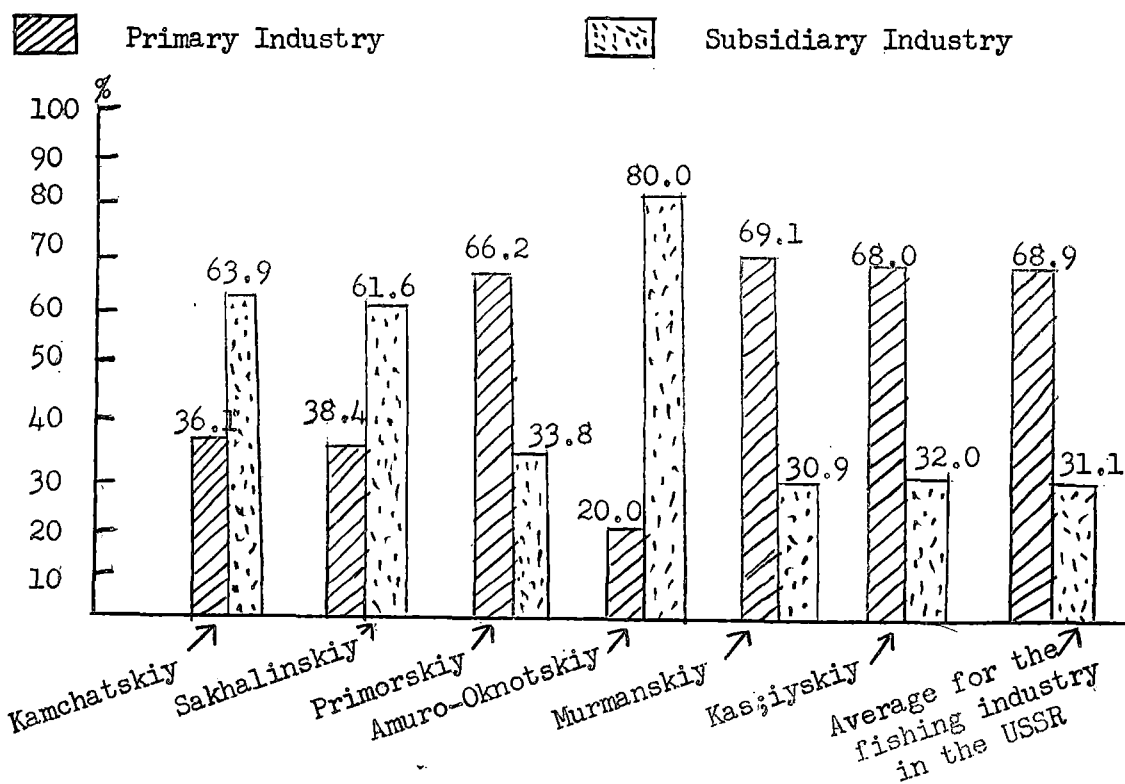


TABLE 12

COST OF TAKING 1 CENTNER OF RAW MATERIAL FROM THE  
MAIN FISHING BASINS OF THE USSR, BY YEARS  
(in rubles)

Basin	1951		1952		1953		1954		1955		1956		1957
	Goslov	Kolkhoz	Goslov	Kolkhoz	Goslov	Kolkhoz	Goslov	Kolkhoz	Goslov	Kolkhoz	Goslov	Kolkhoz	Goslov
Dalne-Vostok:													
Kamchatskiy	107	79	186	118	162	149	281	225	185	181	233	188	205
Sakhalinskiy	217	150	257	165	486	261	447	285	443	323	413	352	368
Primorskiy	124	149	100	163	120	131	134	152	136	195	136	199	135
Okhotsko-Amurskiy	117	89	97	87	186	152	193	146	307	168	---	---	---
Other Basins:													
Murmanskiy	129	314	118	220	119	268	108	259	108	272	120	257	
Kaspiyskiy	162	110	150	115	187	140	176	152	177	147	151	132	

The establishments in the Kamchatskiy and Okhotsko-Amurskiy raions had the lowest cost price for raw material in 1951, both for the state (goslov) and kolkhoz catches. In later years the situation changed noticeably. The cost of catching fish in the Murmansk and Caspian basins was lower in comparison with 1951, while in the fishing raions of the Far East the cost of fishing, in both the state and the kolkhoz establishments, increased sharply. This can be seen from Table 12 above. This increase in cost is accounted for by increased price of netting materials, fuel, and increased salaries along with other factors.

Different results are obtained by comparing the fishing costs for types of boats. The cost of catching one centner of fish using medium size trawlers in the Dalne-Vostok in 1956 amounted to from 169 to 209 rubles (Kamchatka 186 rubles) as against 257 to 394 rubles for the same type of boat in Murmansk, Soviet Baltic and the boats operating in the North Atlantic. The difference is 1.5 to 2 times in favour of the Dalne-Vostochnyy trawlers.

However, it would be a mistake to conclude that it is much more profitable to operate medium sized trawlers in the Dalne-Vostok, in comparison with operation in the North Atlantic.



The decisive factor is the type of catch: in the North Atlantic the catch is herring, while in the Dalne-Vostok it is mostly flounder and only partly herring.

Under essentially similar conditions of work, the cost, to the kolkhozes, of catching fish is lower than it is to the goslov, this is accounted for by the higher efficiency in operation and peculiar structure of expenditures which make up the cost of the catch.

The Dalne-Vostochnyy basin occupies first place in capital investment amongst the fishing industry raions of the country.

The capital investment in the Dalne-Vostochnyy fishing industry basin, which amounted to more than 2 billion rubles in the 5-year period, is more than 2 times greater than the capital investment for the Murmansk basin and 4.5 times greater than for the Caspian basin. The amount of fish and other items of the trade obtained from the Dalne-Vostok in that 5-year period was 2.2 times greater than that of the Caspian and 12.6% greater than that of the Murmansk basin. This is an oblique indicator that the effectiveness of capital investment in the fishing industry of the Dalne-Vostok is lower (note Table 13 on the following page) than for the fishing industry basins of the European part of the USSR.

In terms of fish and marine animal catch per million rubles of capital expenditure, the Dalne-Vostok as a whole had indices which were 2 times less, and in production of total product they were 1 and  $1\frac{1}{2}$  times less than the Murmansk and Caspian basins for that 5-year period. During this period, the Primorskiy raion of the Dalne-Vostok distinguished itself favourably by the two named indices, not only in relation to the Dalne-Vostochnyy raions, but to the European fishing industry basins as well. This is accounted for by the high ratio of whaling and crab fishing in its economy (true, they take place outside the Primorskiy waters), the relatively favourable transport-geographic position of the raion in comparison with other Dalne-Vostochnyy raions, as well as the higher overall standard of development of its economy.

Figure 6 (on page 30) shows these 1955 outputs graphically. The most important reasons for the unfavourable indices of effectiveness of capital investment and the utilization of basic funds in the Dalne-Vostochnyy Basin in comparison with the European fishing industry basins are the following:

1. The sharply expressed seasonal nature of the fishing industry, this, together with the unfavourable transportation facilities, adds to the low efficiency of the establishments and impedes the turnout of the bulk produce which is of particularly high quality and value.

2. The high cost of construction and associated with it increased expenditures of basic funds. The cost of building one square meter of living space in a wooden home in Kamchatka is 35% higher, and for a stone home it is 55% higher than in Murmansk. In comparison with Kaliningrad this difference increases by 2.2 times. The situation in construction of industrial establishments is about the same. In planning the organization of the fishing industry in the USSR, the following coefficients (relative to Moscow) are used in determining the cost of the industrial construction: northern Sakhalin 1.7, the Okhotsk coast 2.1, southern Sakhalin 2.2, Petropavlovsk 2.5 and Kuril'skiye Ostrova 3.3.

TABLE 13

RELATIONSHIP BETWEEN CAPITAL INVESTMENT AND SIZE OF CATCH OF FISH AND MARITIME ANIMAL DURING THE FIFTH 5-YEAR PLAN THROUGHOUT FISHING BASINS

RAION	Total Catch Thousands of Centners	Capital Investments Millions of Rubles	Per million rubles Capital investment	
			Fish & Sea Animal, Thous. cent.	Gross Output Mill. rubles
Kamchatskiy	8766	830	10.6	6370
Sakhalinskiy	6613	554	11.9	9355
Okhotsko-Amurskiy	4316	344	12.6	7061
Primorskiy	9833	306	32.1	18235
Total for the Dalne-Vostok	29,528	2034	14.5	9085
Murmanskiy	26,178	958	27.3	14074
Kaspiyskiy	13,149	460	28.6	16902

3. An unfavourable variety of finished fish products, characterized by a high ratio of low quality and cheap products.

Besides this, it must be taken into consideration that the fishing industry in the Dalne-Vostok, and in particular in Kamchatka, is being reorganized only since the last war, when a large fishing fleet was created and the port facilities were considerably enlarged. Therefore, the higher indices of efficiency for capital investment of the fishing industry of the Murmansk and Caspian basins is, to a considerable degree, the result of a generally better developed industry in these areas. The Dalne-Vostochnyy Basin is distinguished for its rich resources both in quantity of possible catch and in the broad assortment of various items for the trade. Its peculiarities are the following:

a) The high ratio of coastal fishing as against the development of active methods of fishing, this results in a pronounced seasonal catch;

b) the unfavourable implementation of the available fishing fleet, this is associated with the lack of suitable shore facilities;

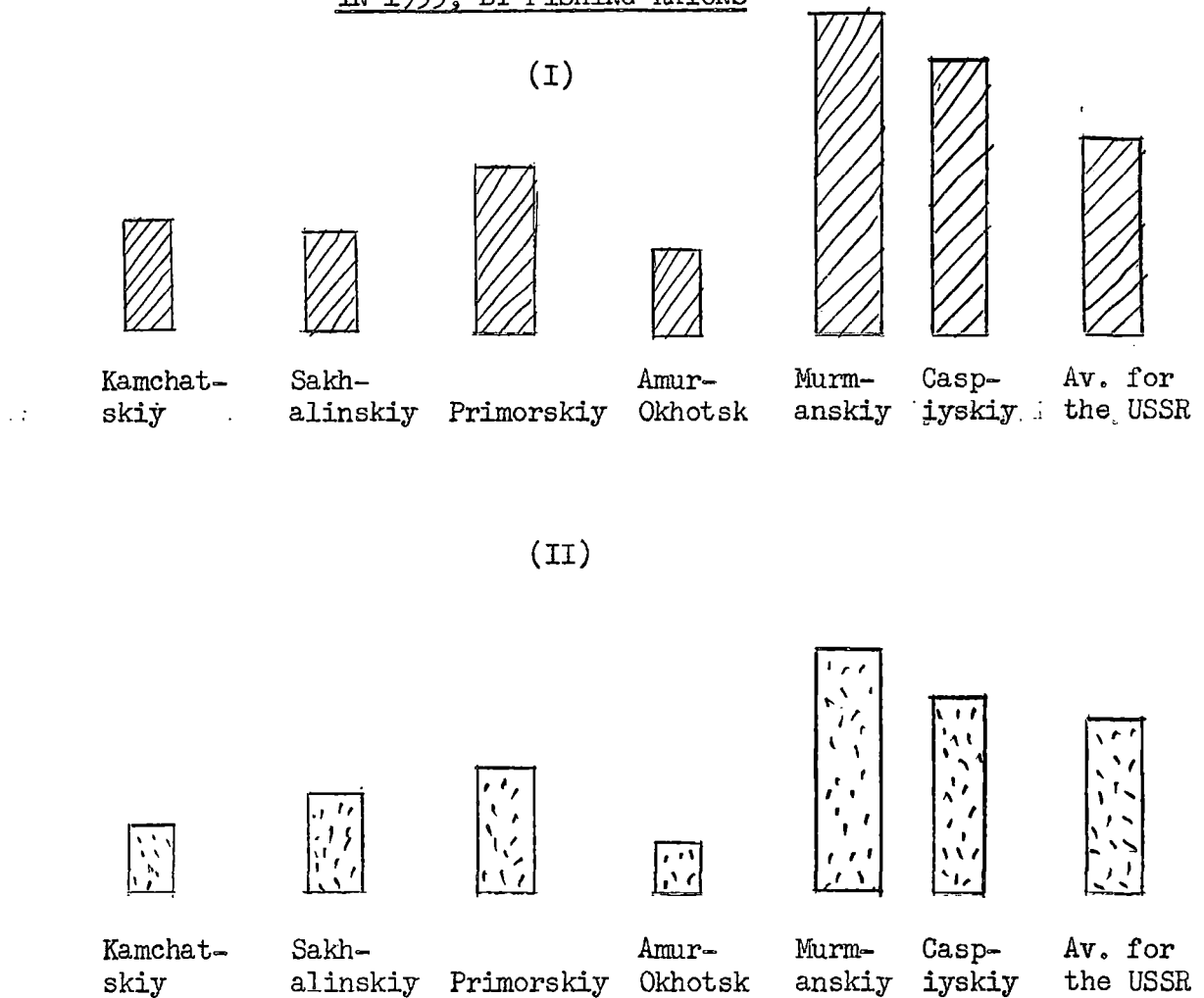
- 30 -

- c) the low quality of the fish products;
- d) the high ratio of small, scattered establishments.

Figure 5

EFFECTIVENESS OF UTILIZATION OF BASIC FUNDS

IN 1955, BY FISHING RAIONS



I. Catch of fish and maritime animal (in thous. centners) per million rubles of basic funds



II. Total output (thous. of rubles) per million rubles of basic funds.

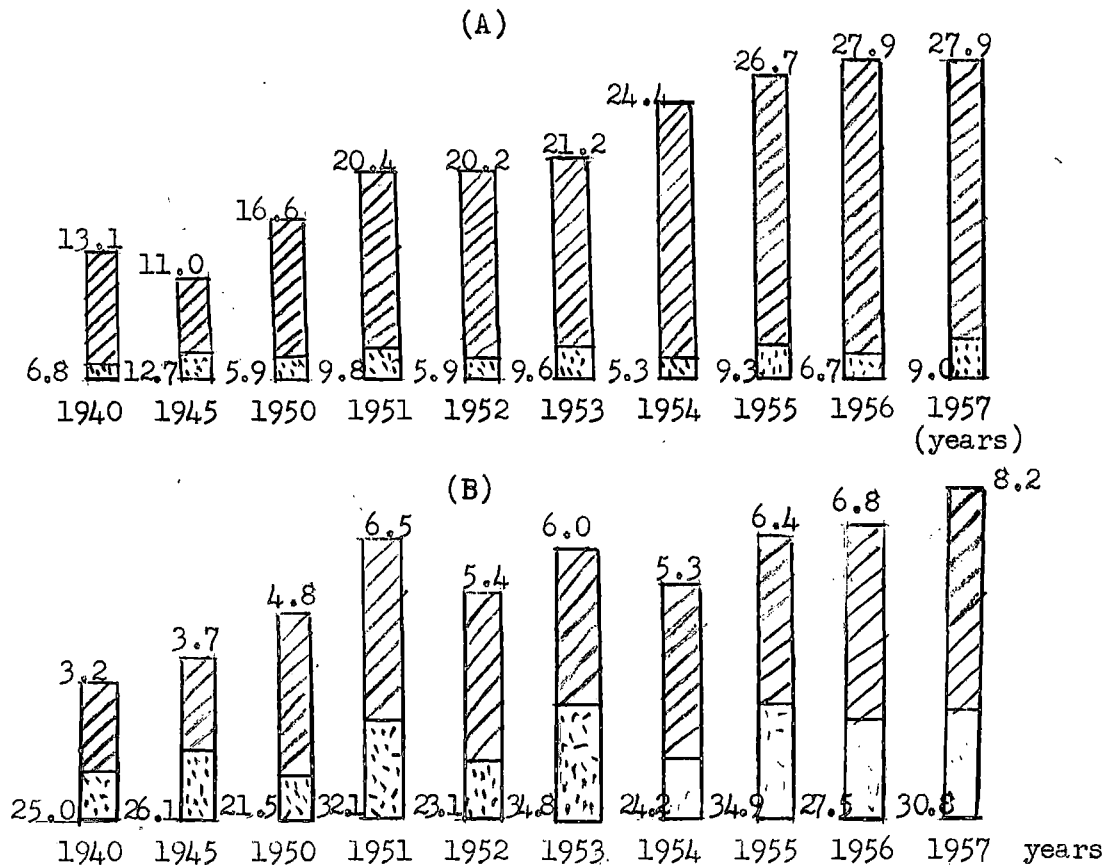
## 2. Raw Resources and Geographic Distribution of Catch

The Kamchatka basin is one of the most important fishing raions, not only in the Dalne-Vostok, but in all of the country. Its ratio of the total catch of fish, marine animal and sea produce of the USSR amounts to approximately 5 to 6% during even numbered years and 9 to 10% in the odd numbered years (see Figure 6 below)

Figure 6

### RATIO FOR KAMCHATKA IN THE FISHING INDUSTRY OF THE USSR (A) AND IN THE DALNE-VOSTOK (B)

-  Catch of fish and maritime animal (millions of centners).  
 Kamchatka's ratio (in %)



A tendency towards a reduction in the ratio of the Kamchatskiy Basin catch to the total fish catch of the country has been observed in the past decade. Thus, from 10 to 14% in 1946-49, it has decreased to 5 to 10% in 1950-57. This means that the rate of growth of the fishing industry in Kamchatka, as well as for all of the Dalne-Vostochnyy Basin, is lagging behind the rate of growth of the fishing industry for the USSR as a whole.

Whereas the total catch and other items of the trade increased by 32% for the country as a whole from 1951-57, the fish catch in Kamchatka increased by only 20%. The situation changed in later years. In 1957 the increase in catch in Kamchatka amounted to 13.6% in comparison with 1955 and 35.6% in comparison with 1956, there was a slight reduction in the catch for the USSR as a whole. It is planned that the rate of growth of the Kamchatka catch will be higher, than the average for the country, during the next seven years (1959-65).

The Kamchatka basin produced 10 to 15% of the canned product in the total for the country and about 40% of the Dalne-Vostok output.

Kamchatka's raw resources are great in extent and varied in species' composition. Fish make up the basic resources, in particular salmon, cod, flounder and herring.

In recent years the salmon reserves, as has been stated above, have been sharply reduced due to the development of large scale Japanese fishing in the Northwest Pacific.

A significant decline in size of catch and numbers of salmon entering the spawning grounds has caused alarm for the future of the salmon industry. (Footnote: A description of the conditions of the fish reserves is given in the materials of the KINRO, presented in the papers by K.I. Panin, F.V. Krogus, R.S. Semko and others at sessions on the problems of developing the productive forces of Kamchatka, June 1957).

The scale and intensity of fishing for Kamchatka salmon, during the last two or three decades, have varied greatly, R.S. Semko notes three main stages:

a) 1934-43, a period of well-developed salmon fishing along the Kamchatka coast (USSR and Japan) and on the open sea (Japan). The yearly average salmon catch reached 2,900,000 centners, the take was excessive and resulted in a decrease in the reproductive reserves of salmon; in some regions the reserves were destroyed;

b) 1946-51, the Japanese had practically ceased salmon fishing and only Soviet organizations engaged in the trade; the yearly average catch amounted to about 1,100,000 centners. The take became moderate, and numbers of fish entering the rivers for spawning increased;

c) 1952-57, this was a period of new and rapid increase in the scale of salmon fishing due to the renewal of Japanese catch of these fish on the open sea; the size of the USSR and Japanese catch reached 2,100,000 centners per year, the take of salmon reserves became excessive and the production of shoals decreased noticeably.

The Kamchatka salmon shoals have come under the influence of intensive Japanese fishing in the Western and Aleutian zones in recent years. This fishing is being carried on across the salmon migration routes.

The increase in Japanese, unregulated salmon fishing on the high seas is the main reason for the reduction in returning salmon to the shores of Kamchatka and for the decrease in the catch. There are other negative aspects to this trade. The loss of fish which break out of the nets and a considerable catch of immature fish also reduces the level of salmon reserves.

Maintenance of the Kamchatka salmon reserves at a high level requires an extension in protective and propagation measures.

A vital role in the maintenance of salmon reserves belongs to fish hatcheries, of which there are none in Kamchatka. Following the establishment of fish hatcheries the salmon catch may be increased by 100,000 to 125,000 centners per year.

Further, it is necessary to take the fishing industry into account when building industrial and energy plants.

It is obligatory to safeguard the necessary conditions for fish breeding. World experience has many examples of this very thing. Thus, in Canada, as the result of a protest to the Minister of Fisheries, the construction of an electric power plant of 1.6 million kilowatt capacity on a lake in which Sockeye salmon spawn was forbidden. The Canadian government proposed that the company build its power station somewhere else.

It is to be understood that in the USSR it is mandatory that the interest of the fishing economy be considered in similar circumstances.

Although the flounder reserves are great (in size of reserves the Kamchatka flounder banks are the first in the world), exploitation, as is shown by the experience on the Yavinskiy Banks, must proceed with care. Neither contamination nor excessive fish-out must be allowed.

The condition of crab reserves on the Western Coast of Kamchatka improved somewhat after the second World War. However, the renewal of Japanese crab fishing in 1955, which is carried on without consideration for the necessity of reproduction, has a negative effect on the state of crab reserves. The Yugo-Zapadnyy raion of Kamchatka has practically lost its significance as a crab fishing ground. The Soviet-Japanese fisheries Commission has carried a number of measures concerning the renewal of crab reserves.

It must be borne in mind that the Kamchatka crab grows slowly. It makes short migrations and is a suitable item for the fishing trade. Catch without concern for the biological peculiarities of the crab can result in rapid depletion of the crab population. The crab reserves are replaced extremely slowly.

The reserves of the remaining items of the trade in the Kamchatka Basin are not as yet being utilized, and where they are utilized (for example cod), then this is done inadequately.

The geographic distribution of the raw resources of Kamchatka's waters are shown schematically in Figure 7 on the following page. The extent of the raw resources in the Kamchatka fishing raion, together with the open areas of the Bering Sea and the Northwest Pacific, are shown by the following data for yearly possible catches: Salmon one million centners, Herring one million centners, Cod 1,850,000 centners, Flounder about one million centners, Pacific saury 250,000 centners, other fish about 300 to 350,000 centners, Crab 550,000 centners. Whale and marine animal 900,000 centners; a total of more than 6.8 million centners (data from the TINRO).

The figures given are a summary of the possible catch, depending on the condition of raw resources. The distribution by raions and types of fish for the future period is given in the third section of this chapter.

The increase in the ratio of sea fish, i.e. herring, flounder, cod and others (Figure 9) on page 37) occurs simultaneously with the reduction in the significance of migrant fish (salmon).

The ratio of sea fish in the total catch of fish and sea animals in Kamchatka has grown from 32.9% in 1940 to 47.5% in 1954 and to 64.3% in 1956.

However, it must be noted that the ratio of marine fish in the total fish catch up to 1954 fluctuated considerably (33.5% in 1945, 24.6% in 1951, 31.9% in 1958). It was not until 1954, when the take of marine fish increased considerably, that the tendency towards growth in the ratio was noticeable for both the even numbered and odd numbered years.

The catches of herring during these years increased by roughly 2 or 3 times, that of varieties of cod by 4 to 8 times and of flounder by several score times, this is accounted for by the development of active fishing for marine fish, in particular flounder - herring, in recent years.

The Sea of Okhotsk is in the lead position in terms of catch of fish and sea animals in the Kamchatka fishing raion. (Note Table 15 on page 37).

The present geographic distribution of fish catch in the Kamchatka basin in terms of individual rybokombinats is shown in Figure 3 on page 20.

About 80% of the total fish catch is taken from the inshore regions of Kamchatka, of this, more than 40-45% is caught on the western coast. The ratio for the open seas comes to only 20% of the total catch.

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Figure 7

GEOGRAPHIC DISTRIBUTION OF RAW RESOURCES IN KAMCHATKA WATERS



1. Flounder "Banks"
2. Fishing Areas for Foraging Herring
3. Crab Beds
4. Whaling Areas



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Figure 8

FISH CATCH IN THE FORMER GLAVKAMCHATRYEPROM  
SYSTEM (In thousands of centners)

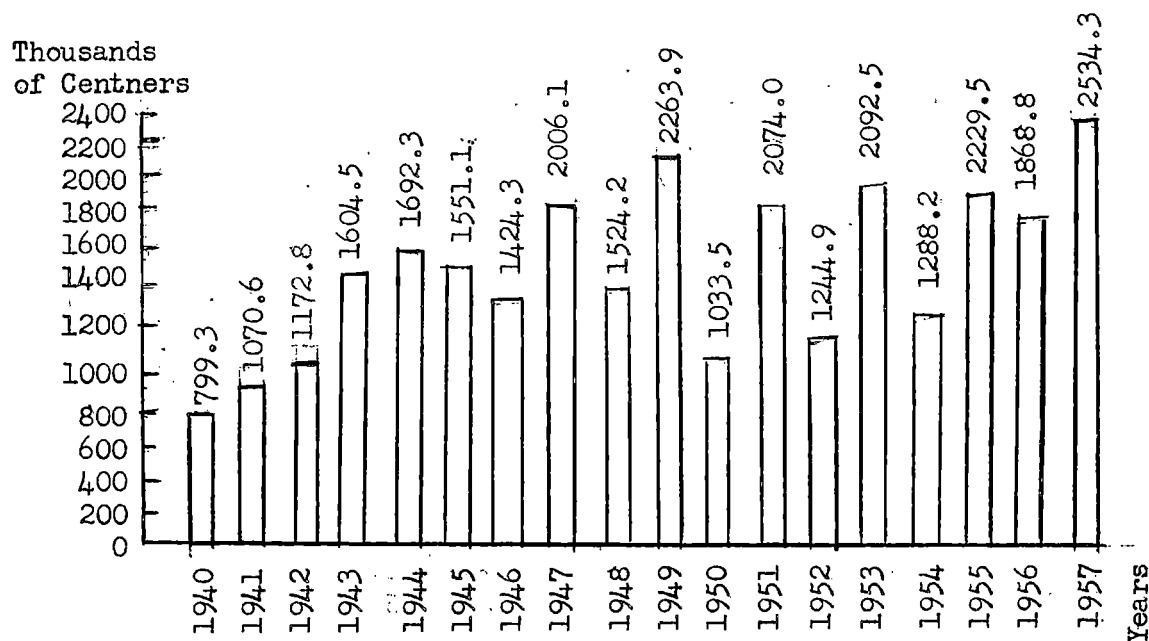


TABLE 14

SALMON CATCH IN KAMCHATKA 1938-1944

(Thousands of Centners)

Year	USSR	Japan	Total
1938	638.4	988.9	1627.3
1939	832.9	1021.6	1854.5
1940	596.4	775.5	1371.9
1941	880.6	992.1	1872.7
1942	944.4	589.4	1533.8
1943	1190.1	645.0	1835.1
1944	1168.4	51.8	1220.2

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Figure 9

CATCH OF BASIC SEA FISH IN THE FORMER GLAVKAMCHATKVEPROM

(thousands of centners)

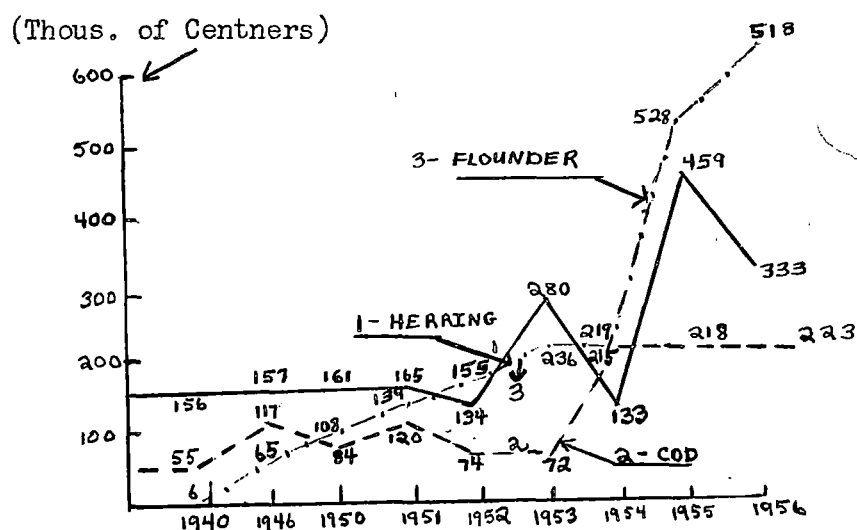


TABLE 15

TAKE OF FISH & SEA ANIMAL IN THE KAMCHATSKIY RAION BY

INDIVIDUAL BASINS FOR 1946-1957 (in %)

Basin	1946	1950	1953	1954	1955	1956	1957
Sea of Okhotsk	47.7	62.0	63.7	73.0	65.5	64.6	64.2
Pacific Ocean	10.6	6.0	4.4	4.2	2.3	12.6	8.5
Bering Sea	41.7	32.0	31.9	22.8	32.2	22.8	27.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0



TABLE 16BASIC ECONOMIC INDICES FOR RYBOKOMINATSIN KAMCHATKA IN 1955

Volume of Fish Caught, thousands of centners	Number of Rybokombinats	Average output per worker, thousand rubles	Loss per 1 thousand centners of fish caught (thous. rubles)
Up to 30	13	22	1030
From 30 to 60	8	40	320
From 60 to 90	4	52	246
Over 90	4	56	133

There are many small combines, in spite of the work of enlargement which has been carried out. Some of these are, for example, the Khayryuzovskiy and the Ichinskiy on the west, and the Olyutorskiy and Ossorskiy on the east; their catch is no more than 45 to 60,000 centners per year. As is known, the size of the establishment has a great influence on the economy of the operation: The larger the rybokombinats, the greater is the average output per worker and the better the financial basis of the work, (Table 16 above), other conditions being equal. The advisability of further consolidation of establishments is obvious from the foregoing data.

ACTIVE FISHING

The building of the fleet for active marine fishing and its rapid growth is one of the most important factors in the reconstruction of the fishing industry of the Kamchatka basin. In spite of the development of active fishing in recent years, its ratio in Kamchatka fishing continues to remain inadequate (Figure 11 on following page).

The catch of fish by active fishing methods in Kamchatka has increased by more than 4 times in recent years in terms of the absolute amount, and by the same amount in its ratio (discounting the Primor'ya and Sakhalin catch). Active fishing brings in more than 40% of the total catch of fish and marine animal in the Kamchatskiy raion at the present time. The bulk of the fish catch in Kamchatka in the past was taken by passive methods of fishing.

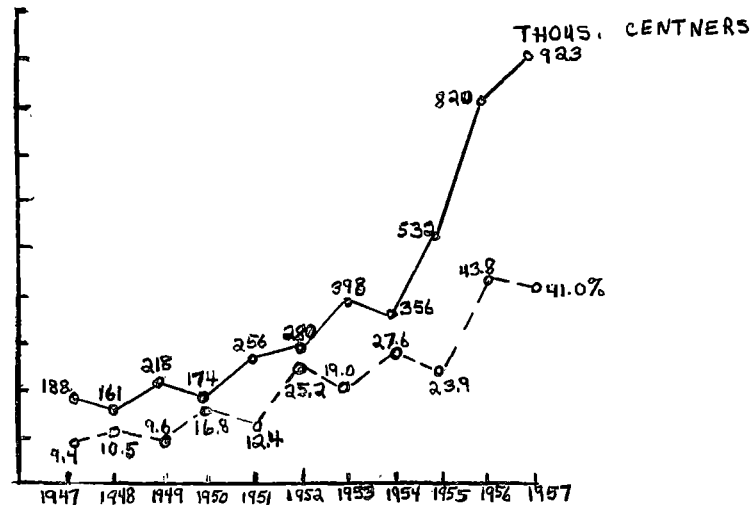
- 40 -

Figure 11

ACTIVE FISHING IN THE FORMER GLAVKAMCHATKYBPROM SYSTEM

Scale Vertically :

1 cm. = 100 thous. centners  
81 cm. = 10%



The development of marine fishing in Kamchatka, as for all of the Dalne-Vostochnyy basin, lags behind the Murmansk fishing industry basin, where more than 90% of the total fish catch and other items of the trade are obtained by marine fishing, as well as behind Japan, where 80% of the catch is obtained in sea and ocean regions.

(Footnote: There is practically no coastal fishing for salmon and herring in the Murmansk basin. But even taking this into consideration the ratio of active catch for Kamchatka is relatively small).

In Kamchatka, active fishing is carried out mainly by boats of four types: large steamer trawlers, medium size trawlers, and medium size and small seiners. In spite of the enormous advantages of the Kamchatskiy raion over the Murmansk raion in fish concentrations, the important results of the trade, i.e., the indices of work per year are far from satisfactory (see Table 17 on the following page).

The low indices for trawler exploitation in Kamchatka are the result of the lack of refrigeration fleet and suitable fishing port facilities (Petropavlovsk is the one port which is able to handle trawlers), as well as the absence of trawler fishing during the summer months.

TABLE 17

COMPARATIVE INDICES OF THE EFFECTIVENESS OF TRAWLER

FISHING IN KAMCHATKA & MURMANSK IN 1951 \*

Indices	Kamchatka Trawlers	Murmansk Trawlers
Number of large trawlers in use	6.0	85.0
Total fish catch, thous. of centners	122.5	2599.3
Average catch per trawler, thous./centners	20.4	30.6
Average/trawler/day, thous. centners	22.7	12.6
Per man per team per year (centners)	510.0	722.8
Cost of catch per centner of raw material, * (%)	122.8	100.0

\* 1951 was the best year for Kamchatka trawlers and is therefore taken for comparison.

The Murmansk basin trawlers spend approximately 2/3 of the year at sea, while 1/3 of the year is spent in port. The Kamchatka trawlers, on the contrary, are at sea for 1/3 of the year (including transport of freight) and more than 2/3 of the year is spent in port.

The fishing time for Murmansk trawlers is more than 65%, while that for the Kamchatka trawlers is less than 25% of the year, i.e. nearly 2½ times less. The time actually spent in fishing is more than 50% of the year for Murmansk trawlers, and just a little more than 10% of the year for the Kamchatka trawlers, i.e., 1/5 of the time.

Relevant computations and work experience on individual trawlers shows that, with improved use of steamer trawlers in Kamchatka, the yearly take can be increased at least to the average level of take for trawlers of the same type in the Murmansk basin.

Medium-size trawlers came into use in the Dalne-Vostochnyy basin in 1951, their prototype was the German lugger. The medium-size trawlers are effective, and therefore the future boats for active fishing, in particular for drifting for herring and trawling for flounder.

The total catch of fish by medium-size trawlers in Kamchatka during 1952-57 increased by 5.5 times, while the herring catch increased by more than 20 times, due to the growth of the fleet by 14 unites (note Table 18 below), this is conditioned by the improved use of trawlers and the increased level of skill in active fishing.

TABLE 18

FISH CATCH BY MEDIUM TRAWLERS IN KAMCHATKA  
1952-1957, (Thous. of centners) by years

Indices	1952	1953	1954	1955	1956	1957
Number of Trawlers .....	21	23	24	23	30	35
Total catch.....	86.8	178.1	141.7	302.3	390.5	480.0
Of Herring .....	4.6	33.0	19.6	69.8	101.4	192.5
Average catch per						
Trawler.....	4.1	7.8	5.8	13.0	13.2	13.7
Of Herring .....	0.2	1.5	0.8	3.0	3.4	5.5
Catch of best trawler ....	11.0	17.2	14.1	21.4	26.9	19.8
Of Herring .....	0.6	3.7	3.0	5.7	8.2	7.3

The Yavinskiy Bank, in spite of its relatively small size, is one of the richest, and possibly the richest, flounder fishing bank in the Kamchatskiy raion. However, its catch efficiency has been lowered more in recent years than on other, less well supplied in terms of reserve banks. The average catch per hour per trawler in 1956 at the Yavinskiy Bank was 2.9 tons, while at the Kronotskiy Bank it was 3.4 tons, at the Olyutorskiy Bank it was 4.7 tons. The influence of continued fishing by a great number of trawlers from all the Dalnevostochnyy Basin has been felt. In 1958 a ban was placed on fishing on the Yavinskiy Bank.

Flounder, as is known, are a stable raw material base for continued intensive fishing. They react very quickly to heavy fishing. The trade has experience of this, not only on the Askol'dovskiye Bank in the Primor'ya, but also the experience in flounder fishing in the North Sea, on the Kaninskiy Bank in the Barents Sea which was twice depleted by English trawlers (in 1906 and 1918-20), and other areas of the Pacific Ocean.

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Flounder fishing is a feature of the trawler trade in the Kamchatskiy and other raions of the Dalne-Vostochnyy basin. Other fish, in particular halibut and cod, are taken as "useless" fish. By the way, specialized fishing for halibut is well-developed in the Pacific Ocean waters of Canada. There, the halibut are caught by means of hook and tackle from small boats of 100-200 horsepower. In 1954, 320,000 centners of halibut were taken. Canadian experience in halibut fishing from small tonnage boats deserves attention. According to Soviet ichthyologists (T.S. Rass and others) the halibut reserves in the Kamchatka basin will support increased catch of the fish and the organization of specialized trade.

A serious obstacle to trawling for cod is the scant knowledge of vertical daily and seasonal migration of the cod.

The essential notion that the Pacific cod stays not on the bottom, but just over the bottom, is not sufficient for solution of the problem concerning vertical migration of the fish. Another item of the trawling trade must be pollock, which must also be fished for at various depths. It is quite possible that trawling at various depths will prove to be an effective means of catching cod, herring and other fish.

Active fishing in Kamchatka, in particular trawling and drifting, is a more costly way of catching fish from the very moment of its inception, than was the passive line mode. This gave rise to the notion that trawling in Kamchatka was without a future, because it was "excessively costly".

This view is incorrect. In the first place, it must be borne in mind that active fishing, far from the shore, provides an additional supplementary catch of fish, which is inaccessible to the inshore trade. In the second place, the high cost associated with active methods of fishing, as has been shown by the experience of other fishing areas, is normally characteristic for the first stage of development of this method. In the third place, the indices of cost of fish caught by the active and passive modes has shown a tendency in favour of the active mode in recent years, (note Table 19 on the following page).

#### Some Problems Concerning Work Production and Profitableness

If you were to compare the catch per fisherman in Kamchatka with his contemporaries in foreign countries, such as the USA and Canada, then you would find that the work efficiency of a fisherman in Kamchatka is approximately 2 or 3 times higher than that of a fisherman in USA, and from 4 to 5 times higher than that of a fisherman in Canada (roughly 350-500 centners per year in Kamchatka, 150 centners in the USA and 80-100 centners in Canada in the period 1944-53). The plenitude of relatively large sources of raw material, their great concentrations during fishing periods, the high standard of technical equipment used by the fishing industry and the socialistic forms of organization of labour underlie the higher productivity in the fishing industry of Kamchatka in comparison with the USA and Canada.

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TABLE 19

COST OF THE GOSLOV TO CATCH 1 CENTNER OF FISH IN THE KAMCHATSKIY  
RAION, BY METHOD OF CATCH (in rubles) BY YEARS

Method	1952	1953	1954	1955	1956	1957	1958
Trawling	200	128	335				
Drifting	237	570	263	175	186	226	205
Danish Seine	---	135	191	126	171	180	179
Hook & line (motorboat)	178	232	462	307	502	285	255
Set net	186	157	278	179	253	175	175
Cast net	62	133	183	185	195	236	203
Fixed net	136	239	---	---	220	223	230
Fixed net (crab)	206	278	283	344	598	445	488
AVERAGE	190	161	281	185	233	205	234

Improvement in the variety of fish products is of primary importance to the fish industry in Kamchatka. This is the main method of converting the Kamchatka fishing industry from one of excessive cost to a profit-making concern.

Computations show (Table 20 on the following page) that should 900,000 centners of salmon of the total 1957 fish catch (2.2 million centners) be allocated to canneries, freezing, chilling, light and medium salting, and 700,000 centners of herring be processed by improved methods, which requires, first of all, development of refrigeration, then the fishing industry in Kamchatka would have become a profitable concern.

In addition, it is necessary to greatly extend the network of refrigeration facilities throughout the trade organizations, these frequently refuse to accept fresh - frozen and slightly salted fish product as a result of which the national economy of the country takes a great loss. The total income from such processing of raw material would amount to 460 million rubles, whereby it would be possible to cover the losses from catch of flounder, cod and other fish and to show a profit of 200-250 million rubles.

TABLE 20

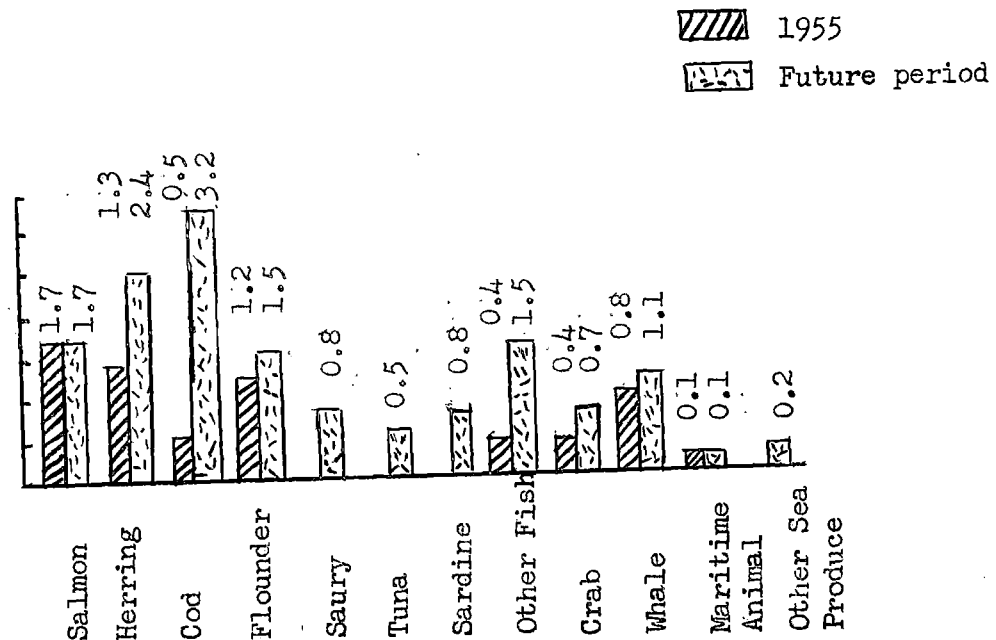
EFFECTIVENESS OF IMPROVED PROCESSING OF SALMON  
AND HERRING IN 1957

Indices	Canning	Freezing & Cooling	Salting		
			Light	Medium	Heavy
The 928 salmon centner catch was distributed	400	200	150	150	28
Profitableness of 1 cent. of pink salmon, rubles	+121	+141	+262	+140	+ 7
Gain on total catch of raw material, mil. rubles	48	28	39	21	1.4
The 830 cent. herring catch was distributed thus	300	---	200	200	130
Profitableness per 1 cent. herring, rubles	+302	---	+267	+159	-41
Gain & Loss on total catch, mil. rubles	+108	---	+ 53	+32	-5
Total Gain, mil. rubles	+156	+ 28	+92	+53	-3.6

Figure 12

VARIETY OF CATCH IN THE DALNE-VOSTOCHNIY BASIN

(in millions of centners)



3. PROSPECTS FOR DEVELOPMENT OF THE FISHING INDUSTRY  
IN THE KAMCHATKA BASIN

The species make-up of the future catch in the Dalnevostochny Basin is given in Figure 12 above.

The Anadyrsko-Chukotskiy sub-raion. This sub-raion includes that part of the Bering Sea, north of the 62nd parallel of latitude. This includes the Anadyrskiy Zaliv and Bering Strait. The most northerly coastal point is Mys Dezhneva, and the extreme southern coastal point is Mys Navarin.

This sub-raion is characterized by relatively shallow depths, which permit trawling for bottom fish to be carried out everywhere. During the winter period the fishing fleet can operate only in the open sea because of the ice, which makes navigation very difficult. The possibilities for coastal fishing are extremely limited. The local population hunt near the coast. Whaling is also carried on.

There are no fishing ports or large shore establishments for the fishing industry in this sub-raion.

The Kamchatskiy Severno-Vostochnyy Sub-raion. This sub-raion includes the area of the Bering Sea between the 56th-62nd parallels of latitude, with the Ozerneyy, Karaginskiy, Korfskiy and Olyutorskiy Zalivs. The extreme northern coastal point is Mys Navarin, and the extreme southern coastal point is Mys Africka.

Depths go down to nearly 4,000 meters in most of the sub-raion. However, the wide coastal zone and the eastern sector from the vicinity of St. Matthews Island and the Ostrova Pribelova have relatively shallow waters and are suitable for trawling. From the point of view of the fish industry the deep water sector of the sub-raion has been poorly studied. Nevertheless, there is basis for supposition that there are considerable periodic congregations of pelagic fish here, mainly herring.

In the navigational sense, fishing is possible the year round since only the inshore belt is ice-covered during the winter. The summertime operation of the fishing fleet is essentially improved by the presence of a number of natural shelters: the Bukhta Yuzhno-Glubokaya and the Olyutorskiy Zaliv, the Bukhta Skobeleva and Siber', as well as Korfa Zaliv and others. A large number of migrating whale are taken during the summer and fall.

Salmon fishing is carried on at many points in this sub-raion, mainly for chum and pink salmon on their way to the spawning grounds.

This sub-raion has no fishing ports. However, rybokombinats are situated along all of its coast line, excluding the sector from Mys Navarin to Mys Olyutorskiy, these combines include such large ones as the Korfskiy and the Anapkinskiy.

The Kamchatskiy-Yugo-Vostochnyy sub-raion. This sub-raion includes the area of the North-western Pacific between the 50th and 56th parallels of latitude, including the Avachinskiy, Kronotskiy, and Kamchatskiy Zalivs. The extreme northern coastal point is Mys Afrika, and the extreme southern coastal point is Mys Lopatka.

Bottom fishing may be carried on in the Zaliv along a fairly wide strip to the south of Avachinskiy Zaliv right down to Mys Lopatka, as well as in the vicinity of the Komandorskiy Ostrova and the Aleutian Islands. The remainder of this sub-raion had deep water. Extensive development of pelagic fishing for saury and herring is possible here.

A heavy fishing fleet can operate practically the year round in this sub-raion, basing itself on the Petropavlovsk fishing port.

Whale are taken in the spring and fall.

The Avachinskiy and Kronotskiy Zalivs are familiar to the light fishing fleet which fish for bottom fish. Salmon on their way to the largest spawning grounds in the Peninsula, the Kamchatka river, are taken in the Kamchatskiy Zaliv by means of trap and drag nets.

The largest rybokombinats, at Petropavlovsk (Avachinskiy) and the Ust'-Kamchatskiy, are situated along its coast line. The Petropavlovsk seaport is situated alongside the Petropavlovsk fishing port in the Avachinskiy Zaliv, it is one of the most important ports in the Dalne-Vostok. The port of Ust'-Kamchatsk is situated in the Kamchatskiy Zaliv, through it pass timber from the Kamchatka river valley, fish products and freight for the supply of the population and the establishments in the river's basin.

TABLE 21

DISTRIBUTION OF FUTURE CATCH OF FISH AND OTHER ITEMS IN THE  
MAIN FISHING RAIONS OF THE DALNE VOSTOCHNYY BASIN

Fishing Raions	Future Catch	
	Millions of centners	% of total
Kamchatskiy	6.9	48
Sakhalinskiy	2.5	17
Okhotskiy	1.2	8
Amurskiy	0.3	2
Primorskiy	1.2	8
Southern part of the Sea of Japan	1.1	8
North-western part of the Pacific Ocean	1.3	9
TOTAL	14.5	100

The Kamchatskiy Severno-Zapadnyy sub-raions. This sub-raion includes the sector of the Sea of Okhotsk between the 50th and 58th parallels of latitude. The extreme northern coastal point is Mys Yuzhnyy, and the extreme southern point is the estuary of the Krutegornaya River. The wealth of this sub-raion consists of salmon headed for the spawning grounds in the numerous rivers and crab. There are usable reserves of bottom fish, but trawling must be limited in order to prevent damage to the crab fields.

Insofar as ice conditions are concerned, the fishing fleet can operate the year round, since ice covers only a limited, 20-30 mile zone along the shore. There are no shore bases for this fleet. The sub-raion is characterized by a complete absence of natural shelter and any artificial protective structures whatsoever. The light fishing fleet is based at the mouths of the rivers, which, considering the limitations imposed on the passage of boats by hydro-meteorological conditions, seriously hampers its work. The cruel storms during the course of the whole year (with the exception of the spring and the beginning of summer) create an additional impediment to fishing.

Of the large fish-processing establishments, note should be made of the Krutogorovskiy combine, which is situated at the eastern boundary of the sub-raion.

The Kamchatskiy Yugo-Zapadnyy sub-raion. This sub-raion includes that sector of the Sea of Okhotsk between the 51st and 55th parallels of latitude. The extreme northern coastal point is the estuary of the Krutogornaya River, and the southern is Mys Lopatka.

This sub-raion abounds in rivers into which salmon pass for spawning. However, due to the re-establishment of Japanese fishing on the open sea, the migration of salmon has been seriously curtailed in recent years.

In the past two or three years, shoals of herring have been found in the southern part of this sub-raion and are being intensively exploited.

Large reserves of bottom fish have assured the possibility of widespread development of trawler fishing on an extended shallow water plateau (Yavinskaya Bank and others).

The flounder industry depends on regulation to prevent over-fishing. Careful regulation of the herring reserves is also necessary.

The hydro-meteorological conditions are somewhat more favourable for operation of a fishing fleet in this sub-raion than they are in the north-western region. In particular it is possible to build a port near Ozernyy which would be open the year round.

At the present time there are no artificial structures or natural shelters for the fleet. The coast appears as practically a straight line. The light fishing fleet is based at the mouths of rivers. A number of the largest establishments of the Kamchatka fishing industry are distributed along the sea-coast of this sub-raion: the Ozernovskiy, Oktyaber'skiy, Kirov, Kikhchikskiy and other rybokombinats.

The Severo-Kuril'skiy sub-raion. This sub-raion includes that sector of the Pacific Ocean to the east of the Islands of Shumshu, Paramushir, and Onkotan and that sector of the Sea of Okhotsk to the west of these islands.

Trawling for bottom fish, mainly cod, is possible in the shallow water zone of the sub-raion, at a relatively short distance from the range of the Kuril'skiye Ostrova. Salmon on their way from the Pacific Ocean and the Bering Sea for spawning in the rivers of the western coast of Kamchatka, the western coast of the Sea of Okhotsk and some other regions of the Dalne-Vostok, pass through the straits between the islands, as well as between Shumshu island and Mys Lopatka.

Fishing for pelagic fish, mainly saury, is possible in the deep water sectors of this sub-raion. Crab and whale are also taken.

The heavy fishing fleet operates the year round, while the light fleet does not operate during the winter months.

The artificial harbour built at Severo-Kuril'sk serves as a shelter for boats, however, the size of this harbour is inadequate. The operation of the fishing fleet is complicated by the fact that the Kuril'skiye Ostrova are practically always wrapped in fog which forms as a result of the collision of warm Pacific Ocean currents and the cold currents from the Sea of Okhotsk.

This sub-raion's fish industry establishments, besides the shore whaling combines, which are part of the Primorskiy Sovnarkhoz system, are included in the composition of the Severo-Kuril'skiy rybokombinat.

Such are the six sub-raions of the Kamchatskiy industrial raions. The approximate distribution of future catches throughout these sub-raions with estimates of the actual catches and the state of raw resources are given in Table 22 on the following page.

Along with the Yugo-Zapadnyy sub-raion, which was and remains one of the main sub-raions of the Kamchatskiy industrial raion, the Severo-Vostochnyy sub-raion will also grow in importance. These two sub-raions will produce more than half of the total fish catch and other items of the industry in the Kamchatskiy raion. Besides boats of the Kamchatskiy Sovnarkhoz, these of the Primorskiy Sovnarkhoz will operate in Kamchatka waters.

The whaling fleet and the floating crab-canning factories, operating mainly in Kamchatka waters, are registered in the Port of Vladivostok at the present time.

An outline of the organization of the fishing industry in Kamchatka.  
The most important line of development for the fishing industry of Kamchatka is its centralization. Servicing of the fleet, processing of fish, preparation of tare and other types of subsidiary industry must be concentrated in the fishing ports of Petropavlovsk and Ozernovskiy and at the large rybokombinats such as Korfskiy, Ust'-Kamchatskiy in eastern Kamchatka, Ozernovskiy and at the large rybokombinats such as Korfskiy, Ust'-Kamchatskiy in eastern Kamchatka, Ozernovskiy and Kirov in western Kamchatka and Severo-Kuril'sk on the Kuril'skiye Ostrova.

The setting-up of large-scale establishments in the Petropavlovsk and Ozernovskiy fishing ports is conditioned by the basing there of a large number of trawlers, seiners-300 and calling boats. In addition to this, navigation in these ports is open the year round.

The Korfskiy and Ust'-Kamchatskiy rybokombinats are situated in the richest raw resources regions of the east coast of Kamchatka. Both these establishments already serve as important bases for the light fishing fleet, in particular for the small seiners-80.

Further development of the rybokombinats at Ozernovskiy and Kirov is planned, due to the raw materials reserves of the adjacent raions, the material-technical base and geographic position of these establishments. Besides this, the suitability of the estuaries of the Bol'shaya and Vorovskaya rivers as shelters for small fishing boats and the calling fleet during storms is taken into consideration.

TABLE 22

FUTURE CATCH AND ITS SPECIES COMPOSITION BY SEPARATE SUB-  
RAIONS OF THE KAMCHATSKIY FISHING BASIN (THOUSANDS OF CENTNERS)

Species of Catch	Total	Sub-Raions					
		Anadyr - Chukotskiy	Kamchatskiy - Severno - Vostochniy	Kamchatskiy Yugo - Vostochniy	Kamchatskiy - Severno - Zapadny	Kamchatskiy - Yugo - Zapadny	Severo - Karil'skiy
Salmon	1000	15	185	100	200	400	100
Herring	1000	---	500	50	20	400	30
Cod	1210	100	350	310	50	200	200
Pollock	430	50	155	75	20	100	30
Navaga	210	---	70	10	10	100	20
Flounder & Halibut	980	5	350	290	40	250	45
Saury	250	---	---	100	---	---	150
Other Fish	330	---	35	95	30	150	20
Crab	550	---	35	15	375	75	50
Whale Type	850	100	350	100	---	---	300
Marine Animal	50	50	---	---	---	---	---
<b>TOTAL</b>	<b>6860</b>	<b>320</b>	<b>2030</b>	<b>1145</b>	<b>745</b>	<b>1675</b>	<b>945</b>

The Ozernovskiy fishing port serves the area 5 kilometers to the south of it and 60 kilometers to its north; the Ozernovskiy rybokombinat serves the area 60 kilometers to the south and 100 kilometers to the north; the Kirov rybokombinat serves the area 70 kilometers to the north; the Korfskiy rybokombinat serves about 1000 kilometers of coastline; the Ust'-Kamchatskiy rybokombinat, on the other hand, serves a very compact area. Petropavlovsk fishing port serves, and will continue to serve, the boats of the active fleet and the calling fleet. The radius of its influence on shore sectors is not significant.

The fish processing establishments situated on the west coast of Kamchatka north of the Krutogorovaya river must be closed down, and the fish caught there by passive methods should be delivered to the floating factories. It may be necessary to hand over part of catch to the fishing kolkhozes for initial treatment.



The shore fish processing establishments of the Severno-Kuril'skiy sub-raion must be entirely concentrated in Severno-Kuril'sk, where there is an artificial harbour serving as a shelter for the fishing fleet as well as a refrigeration plant.

The distribution of catch throughout the main centers of the fishing industry in Kamchatka, with consideration for the radius of their operation, the extent of the raw materials base in the inshore waters and the numerical size of the fleet based there is characterized by the following approximate figures given in Table 23 below.

TABLE 23  
DISTRIBUTION OF FUTURE CATCH BY PORTS & RYBOKOMBINATS OF  
KAMCHATKA (IN CENTNERS)

Establishments	Total Catch	Types of Fishing Boat					
		Large Trawlers	Medium Trawlers	Seiner-300	Small Seiner-80	Sub-Total By Fleet	Passive Fishing Equipment
Korfskiy Combine	590	---	---	---	295	295	295
Ust'-Kamchatskiy Combine	245	---	---	---	115	115	130
Petropavlovskiy Fishing Port	2325	685	870	235	485	2275	50
Kirov Combine	425	---	---	---	55	55	370
Oktyab'pskiy Combine	545	---	---	---	115	115	430
Ozernovskiy Fishing Port	1045	---	440	180	205	825	220
Severo-Kuril'skiy Combine	195	---	---	---	95	95	100
Raions without Shore Establishments	90	---	---	---	---	---	90
TOTAL	5460	685	1310	415	1365	3775	1685

Of the total catch, 42% goes to the Petropavlovsk port and 19% to the Ozernovskiy port.

The proposed organizational structure differs sharply from the existing one. In 1957, the Kamchatskiy Sovnarkhoz had 17 rybokombinats, the establishments of which were distributed over 80 points. Even if some of the 6 combines remaining on Kamchatka will have auxiliary bases, the territory remaining on Kamchatka will have auxiliary bases, the territory served by isolated establishments will be reduced by 10 times, while the average quantity of raw material processed by one establishment will be increased by 20 times.

Concentration of the industry opens up great possibilities for introduction of the latest technical equipment, for significantly increasing the standard of its use, the processing of all the raw material without exception, raising the work productivity and improving the living conditions and well-being of the workers and their families.

Marine docking facilities can be built at all the rybokombinats excluding those included in the fishing ports, these moorings will serve the small fishing boats and the calling boats, which would reduce the calling-time by many fold, improve the sorting of raw material and reduce the cost of loading and unloading operations. The construction, for example, of so-called "Island, or Floating docks", the cost of which depends on the particular conditions but varies from 15-20 million rubles, is quite feasible in 4 to 6 places.

The construction of large refrigeration, canning, salting, and fish meal plants will make it possible to use high production equipment and to improve the technological process. There is every possibility for using hydro-mechanical equipment at large establishments. Highly qualified staff and the scale of mass production will ensure conditions suitable for the introduction of electrical technology, without which it is difficult to imagine the automation of fish-packing establishments, for setting up canning lines with production of 250-300 cans per minute, automatic tables for cutting and salting salmon and so on. Large canning plants could include can-making shops whereby transport would be rid of the unprofitable hauling of ready tare.

It is very important that fish meal, albuminous and vitamin plants or shops be built at each combine. The semi-primitive, utilitarian set-ups that are in operation at many of the establishments of the fishing industry in Kamchatka are not suitable for full utilization of all parts of the fish. Hauling of the remains to other establishments where appropriate equipment is available is not within the means of the Kamchatka transportation system at this time. It would only be practical to haul the most valuable remains over considerable distances, at any rate their quality, as for example the vitamin content of the liver, is considerably lowered during transportation.

The organization of large rybokombinats equipped with modern technology for the processing of the refuse from fish cutting will make it possible to produce a number of valuable food and technical products, such as Vitamin-A concentrates, canned cod livers, canned salmon heads, fish tallow, albumin, glue and others, this would increase the output of fish products and the profitability of the rybokombinat.

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The plant laboratories at consolidated rybokombinats would rise to the level of research laboratories, it would be possible to include a design office at each kombinat and to put the plant operations on a scientific basis.

The extraordinary capital expenditures per unit of production capacity decrease sharply as a result of centralization. According to estimates made by the Giproybprom (State Designing Institute of Enterprises and Equipment for the Fishing Industry), the construction of a four-assembly-line salmon-canning plant in Kamchatka would cost only  $1\frac{1}{2}$  times as much as a two-assembly line plant. Capital expenditures would be decreased even more in the construction of refrigeration facilities and mechanized salting plants.

The introduction of up-to-date technology, a full utilization of the raw materials, increased productivity of labour, the reduction of shop and overall plant expenditures will bring about a reduction in the cost of the product. It is only by reducing costs at the establishments and shops, as the computations show, that it is possible to reduce the production costs by 80-100 million rubles per year. Centralization of production will also have a great effect on culture and life. The housing settlements for the workers will look after their cultural and living needs and will become the centers of cultural life for whole raions, this is particularly important to the national raions in the north of Kamchatka.

### The Production Capacity of Processing Establishments

#### Floating Factories

It is an essentially complex task to determine the capacity of fish processing establishments which are characterized by pronounced seasonal operation.

The productive capacity of processing establishments in Kamchatka is estimated on the basis of monthly graphs showing delivery of raw materials to the rybokombinat, taking into consideration the daily fluctuation in catch. The coefficients for daily fluctuation, characterizing the deviation of the maximum daily catch from the average for the month, were obtained by means of analyses of the data for every fishing method.

Fluctuation in the delivery of raw material has a particularly strong influence on the productive capacity of the salting plants and shops. The refrigeration plants and canning factories have cold storage facilities, which makes it possible to hold the surplus raw material for several days. Construction of similar cold storage facilities at the salting plants is not generally economical since the capacity of the salting plants is greater and the period of operation is considerably less, than for the other fish-processing establishments. The volume of these cold storage plants would have to be very large, their construction and operation would result in an unjustifiable increase in the cost of the product.

It must be taken into account, however, that on days of peak catch, when the capacity of canning plants and the refrigeration plants and the volume of the cold storage facilities are fully loaded, the surplus raw material normally goes to the salting plants. Naturally, such fish as flounder, navaga, cod, etc., will not be salted in the future. However, the relatively low expenditure of labour and capital investment in salting plants makes it entirely feasible to set up reserve capacity for processing salmon and herring.

Therefore, the production capacity of canning plants, refrigeration plants and some other fish-processing establishments is predicated on the basis of daily average delivery of raw material during months of good catches, while the capacity of salt plants is predicated on the delivery of raw material during days of maximum catch. To reduce the necessity for seasonal labour and to improve the use of equipment during periods of salmon migration it is foreseen that longer shifts, up to 10 hours, would be worked and the establishments operated without holidays. Besides this, the possibility of using larger tare (pound cans instead of half-pound cans) would reduce the labour requirements in the processing of a unit of raw material and other similar functions.

After the salmon run, all fish processing establishments would return to normal operation of two shifts and holidays. This excludes the refrigeration, fish meal and curing plants, the operation of which does not permit short-term interruptions in the operation of its equipment. (More accurately, the latter measure is economically not expedient for these types of plants).

In the computation of the productive capacity, adjustment factors were introduced for such things as the interruptions in operation of equipment associated with the completion of tasks, for prophylactic inspection of mechanisms, etc.

Estimates show that the capacity of the main processing establishments in Kamchatka would be of the following types:

1. The Korfskiy rybokombinat: A refrigerator with freezing capacity of 100 tons of fish per day and storage facilities of 2,000 tons volume; a salt plant with a capacity of 100 tons of raw material per shift; a fish meal plant processing 90 tons of raw material per day; a Vitamin-A concentrate plant processing 10 tons of raw roe per shift. Considering that the area of work for the Korfskiy rybokombinat is very great, the above enumerated establishments could be broken up into territorial subsidiary shops in the event that this should be necessary.

2. The Ust'-Kamchatskiy rybokombinat: A two line salmon canning plant (capacity per line is 250 cans of canned salmon per minute); a refrigerator with freezing capacity of 50 tons of fish per day and storage facilities of 1000 tons volume; a salting plant with capacity of 60 tons of raw material per shift; a fish meal plant processing 90 tons of raw material per day; a Vitamin-A concentrate plant processing 2 tons of liver per per day and a caviar plant processing 7 tons of raw roe per shift.

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4. The Oktyabr'skiy rybokombinat: a three-line salmon canning plant and a wing for producing hors d'oeuvres of flounder in the amount of 20,000 can per shift; a refrigerator with a capacity of 100 tons per day and storage facilities of 2,000 tons volume; a salting plant with a capacity for 150 tons of raw material per shift; a fish meal plant processing 150 tons of raw material per day; a Vitamin-A concentrate plant processing 4 tons of liver per day and a caviar plant processing 15 tons of raw roe per shift.

5. The Severo-Kuril-skiy rybokombinat: a refrigerator with capacity of 100 tons per day and storage facilities for 1,500 tons; a caviar shop with capacity for 1 ton of raw roe per shift and possibly, a small fish-meal plant.

6. The processing establishments at the Ozernovskiy fishing port must include: a four line salmon canning plant with a wing for turning-out hors d'oeuvres of flounder in the amount of 40,000 cans per shift; a refrigerator with a 150 ton per day capacity and storage facilities of 6,500 tons capacity; a salting plant with a capacity of 2,500 tons of raw material per shift; a fish-meal plant processing 180 tons per day; a Vitamin-A concentrate plant processing 10 tons of liver per day; a caviar plant processing 15 tons of raw roe per shift and an ice plant producing 170 tons of ice per day.

7. At the Petropavlovskiy fishing port: a plant for processing and canning flounder and saury with capacity for 50,000 can per shift; refrigerators with total capacity of 500 tons per day and storage facilities for 10,000 tons; filleting plants capable of processing 95 tons of raw material per shift; herring processing plants of 250 ton volume per shift; a salting plant processing 100 tons of raw material per shift; a fish-meal plant processing 300 tons of raw material per shift; a Vitamin-A concentrate plant processing 20 tons of liver per day; a caviar plant processing 1 ton of raw roe per shift and ice plants producing 300 tons of ice per day.

Of these, the refrigerator of 300 tons capacity per day and storage facilities for 7-8,000 tons, the filleting plant of 25 tons capacity per shift and the ice plant with capacity for 100 tons of ice per day are to be located at the fishing port; the canning plant and the fish meal plant of 30 tons per day capacity would be in the vicinity of the tin can factory; all the remaining establishments would be in the settlement of Mokhovaya. The refrigeration capacity at Mokhovaya would be used to a considerable extent for storing lightly salted herring. The advisability of placing the canning plant and the fish meal plant in the vicinity of the tin can factory will be confirmed by practical experience at the establishments in the near future. Their transfer into the village of Mokhovaya is not outside the realm of possibility.

The overall capacity of the fish processing establishments in Kamchatka is given in Table 35.

The greatest increase in capacity is planned for the refrigeration-filleting, fish meal and vitamin industries.

The mobilization of present reserves, the accumulation of raw materials in chilled sea water, the replacement of existing salmon canning lines with those of higher capacity, the implementation of a series of organization-technical measures, and mainly, the development of deep-sea fishing and the concentration of production will permit a significant increase in the use of the material-technical base.

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TABLE 35

FUTURE CAPACITY OF PROCESSING ESTABLISHMENTS  
INCOMPARISON WITH 1957

Establishments	Unit Of Measurement	Fore-cast	As of 1957
Canning plants (Salmon)-----	Line	13*	80
Canning plants (saury, flounder)-----	Thous. of Cans/shift	110	100
Refrigeration, capacity, " Volume--	Tons/Day Tons	1050 25000	252 12660
Filleting Plants-----	Tons/Shift	95	-
Salting " -----	"	730	-
Fish Meal " -----	T/Shift	930	207
Vitamin " -----	"	42	1
Caviar " -----	T/Shift	74	109
Ice Plants-----	T/Shift	470	-

\* Output of one line will exceed that of lines in use at the present time by 3-4 times.

Five million cans of canned fish will be produced per line per year on the average, i.e., several times more than at the present time. The total number of salmon canning lines, even with the provision of a reserve, will be decreased sixfold, even though the total volume of production is increased by  $1\frac{1}{2}$  times.

Production of hors d'oeuvres will amount to 400,000 can per line,  $1\frac{1}{2}$  times more than in 1956. When the capacity of all plants has been increased by 10%, the hors d'oeuvres production will have grown by 85%.

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The coefficient of utilization of storage facilities at the refrigeration plants will be increased by 2.5 times while that of refrigeration volume will be increased by 3 times in comparison with 1957.

The planned refrigeration facilities will make it possible to fully meet the requirements of the fishing industry and to ensure the storage of meat and milk products, fruits and vegetables of the marketing organizations in Kamchatka.

The automated filleting plants will operate at full capacity, with the exception of a one month shutdown for overhaul and a two-month period during which raw material is delivered at 75% of volume.

Utilization of the productive capacity of all other establishments of the processing industry will be increased.

The salting plants' turnover will increase by no less than 5 fold, and their total volume will be sharply reduced; the bulk capacity of the fish meal plants will increase by about 6 fold, and the output of the Vitamin-A plants will increase many times, and so on.

Improved utilization of the capacity of the establishments, which is far from fully used both in Kamchatka and in many other fishing basins of the country, will permit a corresponding decrease in the volume of construction and capital investment.

It is planned to deliver in excess of 1 million centners of fish taken in the Kamchatka industrial raion to floating fish-processing establishments, processing refrigerators, canning and salting plants.

The role of the floating processing plants is not determined solely by the development of the fishing industry, whaling, crab fishing and hunting for other sea products at a distance from the shore. The floating processing establishments must also replace those shore plants which do not have a sufficient raw material base, operate seasonally and, as a rule, at a loss.

The per shift output of floating processing plants is lower than shore plants by 15-20%. Capital expenditures per unit of volume in construction of a floating plant is 1.5 higher than in the construction of a corresponding shore processing establishment. Supplementary expenditures for fuel, crew pay, and other factors must be included in the cost of operating a floating plant.

However, the floating plants, in the event that their numbers will not be excessive, can be operated throughout the year. The floating salt plants can, beginning with early spring, take on and process the Sakhalin herring and latter on the Okhotsk herring, herring from the Bering Sea, then salmon and herring from the west coast of Kamchatka. In the fall the floating salting plants will move into the northwestern sector of the Pacific Ocean for work on saury; and in winter they will move into the southern part of the Sea of Japan to work on sardines.

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The floating canning plants will operate in the southern part of the Sea of Japan on sardines during the period from January through March and after that in the same area on mackerel. During July and August they will work on salmon along the coast of Kamchatka and the western coast of the Sea of Okhotsk, after this, to the end of the year, they will work on saury in the northwestern sector of the Pacific Ocean. From March through September, a part of the floating canning-ship fleet can work in the areas of tuna fishing.

Floating processing refrigerators will operate in winter in the southern part of the Sea of Japan, in the northwestern sector of the Pacific Ocean and in the Yuzhno-Kuril'skiy raion on tuna and other fish, while in summer they will operate along the shores of Kamchatka, the Kuril'skiy Ostrova and Sakhalin on salmon, cod, flounder and navaga.

In the fall, a part of the boats will remain in the Southern Kuril'skiy Ostrova and others will go into the Northwestern Pacific Ocean.

Although they do not bear up to economic comparison with the shore establishments which have a lengthy full-capacity operating period, the floating processing plants operate considerably more efficiently than those shore establishments which are clearly seasonal in operation.

The figures given show that the cost of the products from floating producing refrigerators is 5 to 10% lower than the cost of the products from those shore refrigerators which have 2-3 runs per year while the capital investment per unit of product per year is correspondingly nearly half as much. The cost of canned goods prepared on floating canning plants is 10% lower, while the capital investment per unit of product is approximately 1.5 times lower than at a shore canning plant which operates for 1 to 1½ months of the year. The cost and capital investment for a floating salting plant per unit of product is 10% lower than a corresponding shore establishment with a pronounced seasonal schedule of work.

The existing type of floating production refrigerator must be reviewed. The daily freezing capacity of 50 tons is inadequate, a freezing capacity of 50 tons is inadequate, a freezing capacity of no less than 100 tons of fish per day and a storage capacity of 100 tons is necessary. With this equipment they will be able to vitally ease the work of the Kamchatka shore establishments during their peak periods. The work in the Kamchatka fishing raion could accomodate the processing refrigerator of the type TSKB developed in 1956 by the former Ministry of Shipbuilding for the USSR. However, the volume of refrigeration holds proposed in this project appears exaggerated. The question concerning the type of processing refrigerator to be used in the Dale-Vostochnyy Basin must be considered without delay.

The Dalne-Vostochnyy fishing industry does not have a floating fish canning plant at this time. Such a plant would certainly require the hull of a boat with a water displacement of 15-16,000 tons and a main engine of 5-6,000 horsepower.



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The floating salting plant must be placed in the same type of hull as the canning plant. Since lightly and medium-salted products must be turned out, the boat must have refrigeration facilities for cooling the cargo holds. The plant's average capacity would be approximately 200 tons of raw material per day, with operation of two extended shifts.

The floating processing plants would be able to take part of the raw material from the salmon canning plants during the massive pink salmon run and from the refrigeration facilities during the most intensive catch of flounder, herring and other fish. The result will be that the cost of processing fish on the floating plants will go down, and the economic indices for operation of the shore establishments will increase, since the load on these will become more uniform.

The shore processing establishments to the north of the Krutogornaya River are to be closed down completely and the fish catch delivered to the floating factories.

The maximum monthly peak requirements for floating fish processing plants in Kamchatka will be, as appropriate estimates show, 16 processing refrigerators, 5 canning plants and 5 salting plants, for a total of 26 units.

A considerable part of the catch will be delivered to the floating plants in the northeastern sub-raion as well, this area is characterized by a definite seasonal catch and a great length of coast line with unnavigable sectors. The most uniform loading throughout the year and, therefore, the best economic indices can be achieved under conditions of exploitation of the floating factories in all the fishing areas of the Far East. It is expedient therefore, to distribute among the sovnarkhozes only those floating plants which can be assured of a supply of raw material throughout the year. Most of the floating plants must be concentrated in one economic organization and based at the Vladivostok and Nakhodinskiy fishing ports.

### CHAPTER 3

#### WAYS OF DEVELOPING ENERGY

##### 1. THE ENERGY SITUATION

The present energy base is represented by a large number of isolated electric power stations numbering about 300. The present electrical supply structure in the Kamchatskaya Oblast' is given in Table 38.

As can be seen from the Table, electrical power stations which are situated at industrial establishments, mainly at fish industry establishments, predominate in the Oblast'. They comprise 75% of the number of all industrial electrical power plants; they produce about 75% of the total electrical energy generated in the Oblast'. Electrical output of mobile power plants is 12%, communal power plants is 6% and that of rural plants is 1.3%. The per unit capacity of existing electrical power plants is not great.

TABLE 38

Branches of the Economy	All Elect. Power Stations			INCL. Portable		
	Number of stations	Capacity as of 1 Jan. 1958	1957 output in thous. of kwHns	Number of Stations	Capacity as of 1 Jan 1958	1957 output in thous kwHns
Communal						
Total-----	12	1844	4603	2	81	105
INCL. City	1	1194	3559	-	-	-
For transportation	3	2000	8681	-	-	-
Industrial						
Sub-total----	267	26776	44652	67	2224	1574
Rural-----	65	1266	877	9	83	No info.
Other-----	20	3813	8349	8	266	No info.
Total	367	35699	67162	86	2654	-

TABLE 39

Characteristics of the largest electric  
Power plants in Kamchatka as of 1 Jan 1958

Electric Power Station	Location	Type of Plant	Capacity as of 1 Jan 1958 kwatts	output in 1959 thousands kwhh	specific fuel consumption G/kwhh	Cost of power Ruble/kwh
City-Comm unal Seaport	Petro- Pavlovsk "	Diesel	1194	3559	453	0-57
		Diesel	1000	6649	415	No Info
		Steam- Turbine	800	1134	405	»
Shipyard	"	Steam Turbine	1000	12392	449	0--86
		Diesel	1905		418	0-71
Shiprepair Shops	"	Diesel	1044	1041	No Info	} 0-71
		Steam Turbine	5000	9258	»	
Klyuchevskiy DOK	Klyuch Bay, Ust' Kamchatskiy raion	Steam Turbine	920	Inoperative		No Info
		Steam Turbine	1000	3968	»	»
Ust'-Kamchat- sky Rybokombinat	Ust--Kam- Chatsk	Steam Turbine	1000	1554	»	»
Total			14863	39555		

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There is only one 5,000 kilowatt power station in the Oblast'. Besides this one, there are several stations of 1,000 kilowatt capacity (Table 39).

It can be seen from the table that the capacity of the large stations comprises 41.5% of the total capacity of all stationary electric power plants in the Oblast'. Their electrical energy production amounts to 58.6% of the total electrical power output. The unit expenditure of fuel at the large electric power stations in Kamchatka varies from 0.41 to 1.5 kilograms per kilowatt-hour. The cost of electrical energy at the large plants varies from 0.6-0.9 rubles per kilowatt-hour.

The electrical economy of Kamchatka is mainly represented by a large number (About 200 units) of small electric power plants widely distributed over the Oblast', using antiquated equipment and operating on expensive, imported fuel. The economic indices of such power plants are extremely low. The average cost of energy is 1-1.5 rubles per kilowatt hour, at some stations it reaches 3 to 3.5 rubles per kilowatt hour as opposed to 8 kopeeks per kilowatt hour on the average in the Soviet Union. The unit expenditure of fuel is 2.0 to 2.3 kilograms per kilowatt-hour as against 0.479 kilograms per kilowatt-hour on the average in the Soviet Union. Most of the power plants operate on liquid fuel. The cost of this fuel at Petropavlovsk is 550 rubles per ton and higher in the more remote regions. Electrical power supply characteristics are given in Table 40.

Four main electrical supply hubs may be differentiated in Kamchatka: I. Petropavlovsk and the adjacent areas; II. the fishing kombinats and plants on the southwestern coast; III. Ust'-Kamchatsk and the wood-processing establishments in the basin of the Kamchatka River, and, IV. the forfskiy raion. We will examine each of these hubs.

Petropavlovsk is the largest industrial center in the Oblast'. Its establishments produce about 70% of the gross produce. The largest electrical power plants are concentrated here. Its total capacity on the 1st of January 1958 amounted to 11,493 kilowatts, more than half of which is represented by worn-out generators requiring replacement.

II. Most of the fishing kombinats and plants of the south west are confined to the seacoast and require electrical energy for 3 to 4 months of the year. Their electrical energy is supplied by small diesel-powered portable stations and mobile plants.

III. The wood working establishments and Leskhozes situated in the Kamchatka river basin are supplied by even smaller electrical power plants. Larger electrical power stations (capacity of more than 1,000 kilowatts) are found only at Ust'-Kamchatsk.

IV. In the Korfskiy raion, the main users of electrical energy are the coal industry and the fishing industry. The requirements for electrical energy of these and other less important branches of the economy are supplied by small diesel-powered and mobile plants of total capacity of 556 kilowatts and the small thermalstation operating on local coal.

TABLE 40

Characteristics of Electrical Power supply in  
Kamchatska Oblast' Raions as of 1 Jan 1958\*

Raion & Establishment	Capacity as of 1 Jan. kwatt	Output in 1957 thous. of kwhhs	Cost of power in ruble-kop. per kwhh
Elizovskiy Raion (Petrovsk)	11493	34133	No info
Yugo-zapadnyy raion	7596	7521	
Incls			
Ozernovskiy Kombinat	1037	1064	1-36
Bol'sheretskiy "	1149	759	1-91
Iktyab'riskiy &			
Mitobinskiy "	1272	1575	1-00
Kikhchinskiy "	1048	910	2-08
Pymtinskiy "	492	527	2-19
Kirov "	1252	1171	1-84
Krutogorskiy "	551	987	1-29
Ichinskiy "	546	381	2-16
Khayryuzovskiy "	249	147	2-71
Ust'-Kamchatskiy Raion	5440	7710	No info
INCL:			
Ust-Kamchatskiy Rybokombinat	1914	2152	3-68
Klyachevskiy DOK	2014	3968	No info
Bystraya settlement	36	96	>
Kozyrevskaya	330	135	>
Shchapino	57	33	>
Portable plants of the			>
Lespromkmozes	1089	1326	>
Korfskiy Raion	556	489	>
INCL:			
Korfskiy Rybokombinat	456	439	2-78
Coal mines	100	50	2-78

\* The small communal plants at construction establishments have been omitted. Data is not available on them.

Besides the 40 small industrial power plants sited in Table 40, there are 57 even smaller rural stations in Kamchatka (Table 41). They are distributed throughout the Kolkhozes and sovkhoses of the Elizovskiy and Mil'kovskiy raions and the southwestern sector of the Peninsula.

The actual network of power stations and their capacity provides for only a very small amount of the need for electrical energy in the rural regions.

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TABLE 41

Structure of Electric Power Stations in Rural  
Kamchatka as of 1 Jan. 1957

Power Stations	All Rural Power Stations			INCL. Portable		
	Quantity	Capacity in kwatts	1956 output in thous. kwhns	Quantity	Capacity in kwatts	1956 output in thous. of kwhs
Sovkhozes	18	355	327	9	83	30
Subsidiary agricultural establishments	7	60	51	-	-	-
MTS (RTS)	1	138	135	-	-	-
Kolkhozes	2	20	4	-	-	-
Other, Rural	29	372	90	-	-	-
Totals	57	945	607	9	83	30

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TABLE 42

Branches of Economy requiring Power	Number of hours of operation at max capacity	Power Req'mt in thousands of kwhn/year			Capacity in kwatts		
		Elzo- vskiy	Ozern- ovskiy	Yugo- zapadnyy	Elzo- vskiy	Ozern- ovskiy	Yugo- zapadnyy
Fishing Industry	2000	14800	13300	12150	7400	6100	6000
shipbuilding	6500	3440	1400	900	5200	210	138
Building materials Industry	5600	32880	14866	11620	6000	2700	2100
Local Industry	6000	19500	210	6050	3200	46	1008
Transport	5000	10000	5000	5000	2000	1000	1000
Field loads	5000	42000	22500	9500	8500	4500	1900
Communal-Residential needs	3500	35000	15000	12300	10000	3000	2500
Rural Economy	2000	1000	1500	600	500	300	300
Other consumers	5000	50000	40000	26000	10000	8000	5200
Totals		210000	114000	84100	52800	25800	20100
Total for the 3 Raions			410000			98700	

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Thus, the electrical base in Kamchatskaya Oblast' does not meet the requirements of the national economy. The combined output of the electrical power plants was 67.2 million kilowatt-hours in 1957 whereas there was a requirement for approximately 100 million kilowatt-hours per year. In other words, 2/3 of the electrical energy requirements in the Kamchatskays Oblast' are met.

## 2. Balance of the Future Energy Requirements and Possible Schemes for Electrification of the Oblast'

The most populated and most promising from the point of view of industrial development raions in Kamchatka are the Elizovskiy, Ozernovskiy and the Yugo-Zapadnyy. Tentative estimates based on a variety of aspect of the development of industry in the Kamchatskaya Oblast' indicate that the electrical power requirement in the three above-named raions will amount to 410 million kilowatt-hours by the end of the period under consideration. The results of these estimates in terms of branches of the economy in the raions are given in Table 42.

The electrical power requirement amounts to 98.7 thousand kilowatts. Applying a coincidence factor of 0.7, transmission line loss of 12% and electrical power station requirements of 8%, the generator capacity provided for in the power supply system amounts to 84,000 kilowatts. The Elizovskiy raion has the greatest energy requirement in the Oblast', this amounts to 55%, as against 26% for the Ozernovskiy raion and 19% for the Yugo-Zapadnyy raion.

In the other raions of Kamchatka, as a result of the insignificance and wide distribution of electrical power requirements, it is proposed to meet these with power from small mobile diesel-powered and wind-powered plants, with the exception of the better industrially developed Korfskiy raion, where it is possible to build thermal-stations based on the Korfskiy coal deposits.

The energy base of the three raions under consideration can be founded on local energy resources: heat from the Pauzhetskiy geo-thermal springs, the hydro power resources of the Bystraya and Zhupanov rivers, the Krutogorovskiy coal deposits, as well as on imported fuel, i.e., Sakhalin coal or oil.

The expediency of using the above named energy resources will be examined. The use of steam from geothermal sources as a heat carrier for thermal electrical power stations can be economically feasible. Depending on the composition of natural steam, two schemes for thermal electric power station may be employed. In the first scheme there is direct use of steam, which is delivered directly from the borehole to the steam turbine, in the second this steam is transformed beforehand in a special heat exchanger. In the second scheme, side products such as bromine, boracic acid and ammonia may be obtained from the primary steam.

The heat scheme and the whole heat power plant for thermal electric power stations is distinguished by simplicity, particularly where there is no conversion of steam.



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The capital expenditures for a thermal electric station do not have the expense of boiler-heating equipment, fuel economy, chemical processing of water, as well as the expenditures for creating a fuel base. True, there are expenditures for creating a fuel base. True, there are expenditures for drilling the boreholes and building steam delivery lines, and in the event of steam conversion, there are expenditures for evaporators. However, the overall expenditure in building a thermal electric power station based on natural steam is 30% lower in comparison with the conventional thermal-station.

Operating costs, where there is no requirement for fuel supply, are 1.5 times less than the corresponding costs at a conventional thermal electric power station. The cost of electrical energy is considerably less also.

Insofar as hydroelectric power station construction is concerned, of the two rivers named above as being suitable for development, it is economically more expedient to develop the Bystraya River. Construction conditions on this river are considerably easier than they are on the Zhupanov River.

The area selected for a water reservoir on the Bystraya River would permit long-term regulation of flow. The prescribed capacity of the station is 72,000 kilowatts, the assured minimum is 22,000 kilowatts, the yearly energy production would be 500 million kilowatt-hours.

The length of the transmission lines from the power station to the main centers of consumption, at Petropavlovsk and Ust'-Bol'sheretska, is about 200 kilometers.

These lines will pass through the central part of the south of the Peninsula, connecting the eastern and western zones of energy requirements. They will be the main trunk energy systems of the Kamchatka Peninsula, with which it would be possible to connect new electric power stations and transmission lines on the Peninsula.

A negative factor bearing on the construction of a hydroelectric power station on the Bystraya river is the fact that 34% of all spawning salmon in the Bolshaya river basin are to be found in the Bystraya river, above the location proposed for construction of the dam. In good pink salmon migration years the area under consideration on the Bystraya river produces from 74,000 to 133,000 centners of fish. The loss due to the prevention of salmon spawning following the construction of the dam is estimated at 135 million rubles per year. As a result of this it is necessary to construct fish-passes here. The canal by-passing the dam blocking the river would have to be 7,740 meters in length and 14 meters wide at the bottom, with a depth of 1.1 meters.

Regulation of the fish passing through the by-pass canal would be done by means of electric fences. Total cost of all fish-passes is estimated at 250 million rubles. All this renders problematical the advisability of constructing a hydroelectric power station on the Bystraya river in the near future.

The construction of a condenser station at the Krutogorovskiy coal deposit is economically expedient, insofar as local coal is considerably cheaper than that brought in from a great distance. The cost of Sakhalin coal is very high: at Petropavlovsk its selling price is 225 rubles per ton, and in the remote regions from 700-800 rubles per ton; Sakhalin fuel oil costs 550 rubles per ton at Petropavlovsk. Obviously, the cost of extracting Krutogorovskiy coal will be at the same level as the cost of extracting Sakhalin coal which comes to 170 rubles per ton.

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Further consideration must be given to the question of replacing the imported fuel used at the Petropavlovsk and other power stations by Kamchatka coal. However, the hauling of Krutogorovskiy coal over distances of more than 200-250 kilometers, even in the event of construction of an auto road, is not economically feasible. Obviously, the search must go on for new local sources of coal supply. But until these are found, the Petropavlovsk station must be operated on imported fuel. Electrical energy supply in the three raions under consideration, to meet the approximate demand of about 4410 million kilowatt-hours per year at a fixed capacity of about 1,000 kilowatts, can be achieved in three ways: 1) by use of long transmission lines, 2) by use of long transmission lines and consumption of electrical energy at the points of its production, and 3) decentralized production of electrical energy by means of individual stations at the point of consumption.

The combination of capacities in each of the stated schemes would be so selected as to insure that the full requirement was met. Consideration will also be given to the necessity for growth in capacity at the individual station, as well as in the system as a whole. By the end of the period under consideration the total capacity of the stations should come to approximately 100,000 kilowatts. Increase in capacity must accompany the increase in requirement for electrical energy.

The Kamchatskaya Oblast' Energetics has the following tasks.

1. Energy development must be based to a considerable degree on local resources.
2. It is necessary to stop the large scale construction of small, unprofitable power plants.
3. First stage of energy development must be directed towards regional and zonal electrical power stations.
4. Further prospecting of local coal sources is necessary for the future development of energy.
5. Much more work must be done on the economic and technical aspects of utilizing geothermal resources.
6. It is desirable that prospecting be done for oil as a source of local energy fuel.
7. It is entirely advisable to replace the small, dieselpowered electric power plants and mobile plants by wind operated generators, particularly in the remote regions.
8. Experimentation in the area of extraction, drying and utilization of peat as an energy fuel deserves consideration.
9. Further scientific work on the problem of energy in Kamchatka at its second stage of development is timely, as well as work on the concrete problems of energy supply to individual branches of the economy and raions, particularly the Mil'kovskiy raion and all of the Kamchatka river basin.

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#### CHAPTER 4.

##### THE TIMBER INDUSTRY

The timber industry is an important branch of the national economy in the Kamchatskaya Oblast'. Timber is used mainly by the fishing, building and local branches of industry.

Forested areas amount to 19029.4 thousand hectares, of which 8106.7 thousand hectares or 38.7% are under timber stands. Rock birch predominates as the type of tree, it is widely distributed over the territory of the Kamchatskaya Oblast'. Conifers, consisting of larch and spruce are found only in the Kamchatka river basin.

Total forest reserves are estimated at 924.5 million cubic meters, of which the deciduous species make up 773.9 million cubic meters (83.7%) and conifers 150.6 million cubic meters (16.3%). Three-fourths of all the reserves are mature and old stands, these are characterized by low quality and a considerable amount of faulting. The cut of workable timber of various types amounts to 70-75% of the conifer species and 5-8% of the deciduous species. Forests suitable for industrial utilization are concentrated in the Kamchatka river basin from the Kirganik river on the south of the Elovka river on the north.

The main forested raion is the Tsentral'nyy, it is situated in the Kamchatka river basin and unites the Sredne-Kamchatskiy and the Ust'-Kamchatskiy leskhozoes. In this area, forests with a timber reserve of 297.5 million cubic meters are concentrated, these include conifer species in the amount of 111.6 million cubic meters (of these, 83.6 million cubic meters are larch and 28 million cubic meters are spruce) and deciduous species amounting to 185.9 million cubic meters (of which rock birch makes up 139.2 million cubic meters).

In so far as the western and eastern forest raions are concerned, these have only birch stands which are mainly used for firewood. The birch stands have a low reserve of timber (50 to 60 cubic meters per hectare, and give insignificant amounts of workable assortments (5%). A sub-raion is distinguished in the central forested raion for industrial exploitation, it occupies the central part of the Kamchatka river basin. Its timber reserve is characterized by the figures given in Table 44.

The structure of the ready reserves of timber is given in Table 45.

The timber industry in the Kamchatskaya Oblast' is represented by the following establishments: the Kamchatskiy and Kozypevskiy lespromkhozoes, which prepare timber, and the Klyuchevskiy wood-processing kombinat. They are located in the Kamchatka river valley.

During the period 1950-1955, the timber industry in Kamchatka grew by approximately 1.4 times, wherein this increase came about mainly in workable timber (Table 46). In 1956-57 the volume of timber produced dropped sharply, particularly in workable timber, this is largely associated with unsatisfactory transportation conditions for delivery of timber to the user. Thus, in 1956, ocean-going boats hauled away 78.7 thousand cubic meters of timber, and in 1957, they hauled away 115.7 thousand cubic meters of timber when it was necessary to ship 250 thousand to 300 thousand cubic meters of timber.

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TABLE 44

Ready Reserves in the Forested Area  
Under Exploitation

SPECIES	READY RESERVE	
	Mill. Cu. m	o/o
Conifers total	98,1	50,5
Larch	76,0	39,1
Spruce	22,1	11,4
Deciduous Total	95,3	49,5
Birch	91,6	47,6
Poplar	3,7	1,9
Totals	193,4	100,0

TABLE 45

Ready Reserves of Timber in the Raion  
Under Exploitation, By Assortment

VARIETY	CONIFERS		DECIDUOUS	
	Mill m <sup>3</sup>	o/o	millions m <sup>3</sup>	o/o
Saw & Construction timber	55,6	56,7	2,0	2,1
Other usable timber	-	-	5,7	5,9
Mining Pilings	14,7	15,0	-	-
Remainder	2,6	2,7	-	-
Firewood	25,2	25,6	87,6	92,0
Totals	98,1	100,0	95,3	100,0

TABLE 46

Volume of Woodcutting in the Oblast'  
by years

ITEM	Unit of Measure	1950	1955	1956	1957
Woodcutting Total	Thousands of cu. meter	554	756	572	570
INCL. Usable Timber	"	183	353	273	240
Firewood	"	371	403	299	330

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TABLE 47

Basic Work Indices, Timber Industry,  
"Kamchatka" Trust, by years.

ITEM	UNIT OF MEASURE			
Gross output - total	Thous. of rubles	57342	50217	55369
Timber cutting	"	40276	31952	27520
Wood-workings Industry	"	17066	18265	27849
Tree Felling - total	Thous. of m <sup>3</sup>	451,0	328,0	279
Mechanized Felling	o/o	43,2	39,7	44,6
Hauling Total	Thous of m <sup>3</sup>	329,0	267,0	267
Mechanized hauling	o/o	43,2	39,7	44,6
Delivery, total	Thous of m <sup>3</sup>	431,0	316,0	281
Usable Timber	"	324,0	241,0	211
Mechanized Delivery	o/o	82,9	89,7	94,7
Launched for Floating	Thous. of m <sup>3</sup>	400,0	562,0	487
Composite output per worker				
Logging	m <sup>3</sup>	221	210	203
Floating	"	551	570	532
Cost of logging operation per 1 m <sup>3</sup> of lumber	Ruble-kipeek	194-09	214-54	217-09

A situation such as this makes it necessary to stop local lumbering. At the same time delivery of timber to Kamchatka from other raions of the Far East in 1955-57 was at the level of 150 thousand to 200 thousand cubic meters per year.

In recent years the Kamchatka timber industry has been converted from a backward industry using hand tools to a mechanized branch of the national economy of the Oblast'. On the first of January 1958, the timber industry had 70 tractors, this included 60 towing tractors of the type TDT-40 and KT-12, 129 electrical saws, 83 gas-powered saws of the type "Druzhba", 49 portable electric generators, 17 loading cranes, 24 winches, 11 saw frames (saw mills) more than 90 trucks and 73 trailers of various types, 47 cutters, as well as other equipment.

The Kamchatka timber industry has the basic work indices given in Table 47.

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The data in Table 47 show that mechanized felling accounted for 91 and 97% of all felling and is at the standard for mechanized felling in the timber industry of the USSR. However, felling is mainly done by means of electrically-powered saws. The gas-powered saws of the type "Druzhba" are not being used sufficiently.

Experience has shown that widespread introduction of the gasoline-motor powered saw "Druzhba" and the change to felling by one man (instead of two fellers) gave rise to a growth in the productivity of labour and a decrease in the cost of timber. With the introduction of gasoline-motor-driven saws large numbers of qualified workers are released for other tasks, the necessity for movement of costly portable electric power generators is eliminated and there is an economy on fuel and cable. The cost of prepared timber is reduced by from 30 to 50%.

Mechanized delivery of timber to the "Kamchatles" trust amounted to 40-45% as against 79% overall for the timber industry in the country in 1956. Hauling is done mainly by means of the tractor KT-12, TDT-40, winch and horses. At the wood lot the felled trees are limbed, cut into logs and delivered to the roads. The change to hauling trees with their tops on is being done slowly, although the advantages of this method are obvious. It eliminates the waiting period for tractors, which can occur during conventional hauling due to the lack of logs.

Loading and unloading operations at the "Kamchatles" trust were only 17 to 20% mechanized in 1956-57, while the forestry industry in the nation was mechanized to as much as 69%. The low standard of mechanization for loading work and the inadequacy of loading equipment results in the situation that the timber hauling trucks at the "Kamchatles" trust stand for up to 40 to 50% of the working day loading, awaiting unloading.

The level of mechanization of hauling timber out was from 85 to 95% in 1955-57, while for the country as a whole it amounted to an average of 82%. Logs are hauled out mainly by trucks and occasionally by tractor.

The growing advances in technology and the planned increase in the volume of timbering operations requires the construction of year-round roads.

There is a lack of good auto roads in the forested areas of Kamchatka for delivery of timber to the floating points and consumers.

This lowers the efficiency of the log-hauling equipment and raises the cost of hauling, which is at the level of 1.5 to 2.0 rubles and more per ton/kilometer.

Experience in organizing logging operations in the leading Lespromkhozes of the Archangel and Vologodskaya Oblast's, as well as data on logging operations in Canada show that these operations are based on construction of permanent roads with a gravel or crushed rock surface. This would make it possible to greatly reduce the distance for hauling timber and to put the towing and hauling equipment in the most favorable position, thus ensuring the success of the timbering operation.

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It is known that in Canada, road construction takes from 50 to 70% of all capital investments put into the construction of timbering establishments. In the Soviet Union expenditures on road construction amount to only about 20% of the total capital investment in the timber industry. Trucks carrying 30 to 50 cubic meters of timber are used on Canadian roads. The average capacity of trucks hauling timber on Kamchatka roads is 9.5 cubic meters.

Productivity per worker at the "Kamchatles" Trust in 1956-1957 amounted to 210 to 203 cubic meters as against 275 cubic meters (1956) on the average for the former Minlesprom, USSR, and 500 to 600 cubic meters in Canada.

Footnote: These figures relate to the eastern Provinces. In British Columbia output rises to 800 cubic meters, and in individual cases to 1000 cubic meters per man per year. (End of footnote.).

The high productivity in logging operations in Canada in comparison with our indices is accounted for by the efficient organization of work, minimum expenditure of labor at individual stages of the technological process and the absence of intermediate timber yards when logging is carried on by lumbering establishments, these haul the timber out, thus by-passing the timber yards.

A combination of the logging and lumbering industries, as Canadian experience shows, produces most favorable results. The change to such a method of carrying on the industry will free a large number of workers and will greatly reduce the cost of timber.

The remarkable productivity in logging in Canada is closely associated with the one-shift operation, and the assignment of each piece of equipment to individual workers. This facilitates excellent maintenance of all equipment and its high efficiency. A small number of workers are employed at the repair shops, the supply of spare parts is excellent. There are very few auxiliary workers in comparison with the logging industry in the USSR; their ration in the logging industry in the Kamchatskaya Oblasts in 1956-1957, e.g., was more than 50%, in the USSR establishments it was about 45%, while in the logging operations in Canada it was from 14 to 20%.

The shortcomings noted above condition the low technical-economic indices of the timber industry and as a result of this, the high cost of timber, which in 1956 at the Kamchatles Trust came to 214 rubles 54 kopecks per cubic meter, and in 1957 was 217 rubles 09 kopecks. By way of comparison, it is stated that the cost of timber at the "Khabarovskles" is at the level of 80 rubles per cubic meter.

The unsuitability of the Kamchatka river for floating operations, great losses of timber en route, the large expenditures and losses on auxiliary and subsidiary industry are the main reasons for the high cost of floated timber. In 1956 and 1957, timber floating costs ranged from 114 to 120 rubles per cubic meter, while the average for the timber industry in the Soviet Union was 35 rubles. Here, as at the lumber mills, the greatest part of the cost structure is taken up by auxiliary-subsidiary services (18 to 20%) and invoicing charges (15 to 18%).

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Output of materials in 1955 in the Kamchatskaya Blast' amounted to 99 thousand cubic meters, in 1956 it was 109 thousand cubic meters and in 1957 it was 132 thousand cubic meters. The Klyuchevskiy wood-dressing kombinat produced the bulk of this output; it is the largest establishment of the timber industry in the Kamchatskaya Oblast' (Table 49). The kombinat was built on a limited territory, and technological coordination amongst the shops is nonexistent. Its industrial buildings are dilapidated, and the equipment antiquated. In 1947 reconstruction of the kombinat was begun, but it has been extremely delayed, and has not yet been completed.

The capacity of lumbering establishments makes it possible to practically fulfill the needs of the Kamchatskaya Oblast' for timber at the present time, this amounts to about 500 thousand cubic meters. Thus, in 1954, the volume of workable timber cut amounted to 453 thousand cubic meters. However, in the absence of a solution to the transportation problem along the Kamchatka river and that of hauling lumber out through the port of Ust'Kamchatsk, the volume of workable timber cut was reduced in the following years and in 1957 it amounted to 240 thousand cubic meters.

Because of transportation difficulties, the consumers received only a part of the timber. In 1954, of 453 thousand cubic meters delivered to the float streams, the consumer received 269 thousand cubic meters of workable timber out of 431 thousand cubic meters of logs hauled out. In 1956, of 316 thousand cubic meters, 288 thousand cubic meters were realized; in 1957, of 281 thousand cubic meters the consumer received 237 thousand cubic meters. In 1955, 45.8 thousand cubic meters of timber were shipped out of the port of Ust'Kamchatsk to other raions in the Oblast', while in 1956, 78.7 thousand cubic meters were shipped out; in 1957, 115.7 thousand cubic meters were whipped out instead of the 250 to 300 thousand cubic meters which were ready for delivery.

This situation makes it necessary for the consumers to bring in timber from the southern regions of the Far East. In 1955, the ports of the Primor'ya and the Amur river channel shipped in excess of 200 thousand cubic meters of timber to Kamchatka, and in 1956 they shipped about 150 thousand cubic meters.

In period under consideration (the next 10 to 15 years) the composite nature of the Kamchatka economy will be extended. It is planned to develop coal mining, production of local building materials and agriculture in the Oblast'. There is a basis for development of the mining industry. There will be a considerable expansion of industry, transportation and civil construction.

The main branch of Kamchatka's economy, as before, is the fishing industry, the development of which is associated with the utilization of the enormous raw resources of Kamchatka's waters.

The demands from the fishing industry and the other branches of the economy for timber determine the scale of future development in the Oblast's timber industry.



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TABLE 49

Work Indices at the Klyuchevskiy wood-  
working Kombinat, by years

INDICES	Unit of measure			
Saw timber output	Thousands of m <sup>3</sup>	54,7	63,4	75,2
Woodworking output				
Barrels	Thous.B/ centner m <sup>3</sup>	129,0 9008	128,9 8858	140,5 8472
Boxes				
Cost per unit of product				
Sawtimber m <sup>3</sup>	Rub & Kopeek	297-29	280-85	336-54
Barrels(B/Centner)	"	64-05	62-20	73-48
Boxes, m <sup>3</sup>	"	1081-15	956-08	974-52

Table 50

Anticipated Requirement for Timber in the  
Kamchatskaya Oblast' (Round figures) (Thous of Cu metres)

RAION	Fishing Industry	Other Branches	Total
I. Vostochnaya Kamchatka			
Petropavloskiy	230	100	330
Ust'-Kamchatskiy	35	25	60
Korfskiy	60	25	85
Other	5	-	5
Sub-Total	330	150	480
II. Zapadnaya Kamchatka			
Ozernovskiy	100	20	120
Oktyab'rskiy	50	10	60
Kirovskiy	45	20	65
Other	5	-	5
Sub-Total	200	50	250
III. Severo-Kuril'skiy	20	-	20
Total	550	200	750

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In future there will be a sharp increase in the use of cardboard boxes for packing frozen fish products and some of the canned products; there will be an increase in the requirement for wooden boxes for packing refrigerated and lightly salted fish products as well as canned products intended for export. There will be a reduction in the requirement for barrels in connection with the reduced export of heavily salted fish products.

Rough estimates place the Kamchatka fish industry requirement for timber at 550 thousand cubic meters. The corresponding future growth in other branches of the economy, construction and population will increase the requirement for timber by approximately 200 thousand cubic meters. Thus, the total future requirement of the national economy of the Kamchatskaya Oblast' for workable timber amounts to about 750 thousand cubic meters per year. A break-down of this figure by raions is given in Table 50.

It must be borne in mind that the proportion of saw-mill and construction timbers obtained from the coniferous species in Kamchatka reaches 56.7%. To this must be added a quantity of mining timbers to meet the future requirement in coal and non-ferrous metal mining. On the whole, the ratio of usable timber which will be required by the industry of the Kamchatskaya Oblast' comes to approximately 60%. This means that the volume of timber cut in the Kamchatka river basin, up to 0.9 million cubic meters per year, can produce 540 thousand cubic meters of usable timber which would be used up within the Oblast'.

Thus, only a part, although it is a large part, of the Kamchatskaya Oblast' requirement in timber can be met by local resources. The remainder of the requirement would be covered by imports from abroad of usable timber of 200 to 250 thousand cubic meters.

At the present time consumers are importing timber, not only because of transportation difficulties, but because the imported timber is cheaper than the local product. At the present time the average cost per cubic meter of imported timber (from Primor'ya), including transportation costs at Petropavlovsk comes to about 392 rubles, local timber (from the Kamchatka river basin) costs 528 rubles, while at Ozernaya the respective costs are 470 and 696 rubles.

In the future, it will be more expedient to supply the west coast of Kamchatka with timber imported from the Primor'ya, insofar as the total costs to the consumer are lower (234 rubles per cubic meter) in comparison with the delivery of local timber (277 rubles per cubic meter). This difference will be even greater if timber is supplied to Western Kamchatka, not from the Primor'ya where the timber reserves are inadequate, but from the raions closer to Kamchatka on the lower waters of the Amur River.

The production capacities of the Kozyrevskiy and Kamchatskiy Lespromkhozes guarantee the production of 400 to 450 thousand cubic meters of timber per year. Therefore, the extension of lumbering and the ability to meet the consumer's requirements for timber in Kamchatka requires the organization of only one or two new lespromkhozes.

## CHAPTER 5

### The Rural Economy

Greater expansion of the rural economy began in 1929-1930 when, in association with the growth of fishing industry, with the renewal of the timber industry and transport construction there was a large influx of population into Kamchatka. The need arose for local production of such relatively untransportable produce as potatoes, vegetables, milk and fresh meat. In 1929, collectivization of Kamchatka's rural economy began, agricultural artels were organized, and, in the coastal areas, fishing artels were organized. In 1929, the first sovkhos in Kamchatka was organized at Petropavlovsk, it was situated within 3 kilometers of that city. In 1930, the Krozyrevskiy sovkhos was set up in the Kamchatka river valley, the Bol'sheretskiy sovkhos was set up on the West coast of the Bol'shaya River and reindeer sovkhoses were organized in the northern regions of the Koryakskiy National Okrug.

Since that time, in 30 years, the rural economy of Kamchatka has grown from one of fulfilling the restricted local requirements to a sovkhos-kolkhoz economy of considerable volume.

In 1957, the Kamchatskaya Oblast' had 12 sovkhoses, 2 MTS, 23 agricultural artels, 29 subsidiary industries in conjunction with the industrial establishments of the sovmarkhoses and a number of businesses connected with cooperative and other organizations (see Figure 18). Fifty-two fishing artels engaged in farming as a subsidiary branch of their economy. More than 25,000 workers employed at the kolkhoses planted their own gardens, raised dairy stock, hogs and poultry.

From 1927 to 1957, the planted areas increased from 85.7 hectares to 10,000 hectares, the number of head of cattle increased from 4.6 thousand to 21.7 thousand, that of hogs from 0.2 thousand to 17.0 thousand, horses increased from 2.1 thousand to 5.6 thousand head and poultry from a few hundred to 101 thousand birds. Such branches of the economy as tilling, hog raising and poultry raising were newly organized by the Soviets. Earlier, greenhouses and hotbeds were unknown in Kamchatka; at the present time their usable area comprises 50,000 square meters. Only reindeer raising, which increased from 123,000 head in 1933 to 197,100 head in 1945, has shown a marked decrease in the past ten-year period.

Agriculture has become a fully integrated and important branch of the Oblast's economy. The 1956 total value of gross agricultural produce from all categories of the economy amounted to 96.5 million rubles. The ratio of agriculture as a subsidiary branch has also increased in the areas populated by indigenous peoples, where the original and basic branches of the economy up to this time has been reindeer raising and hunting.

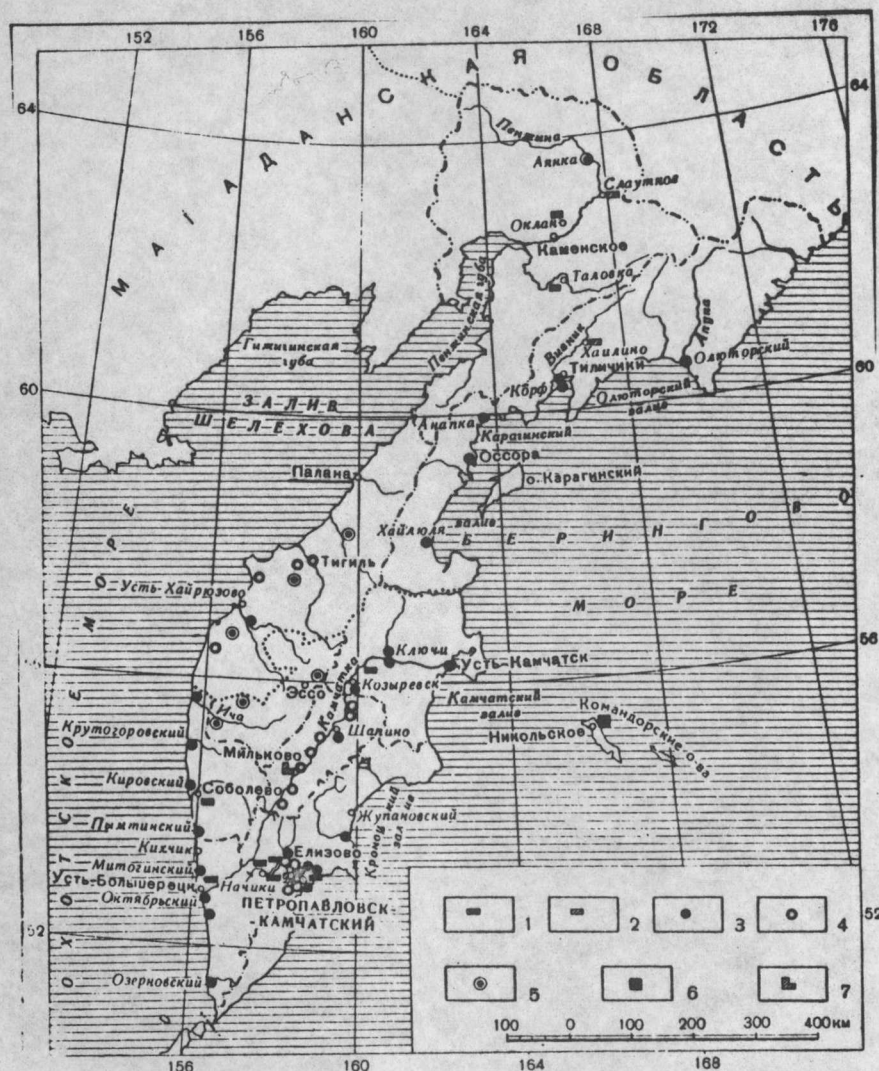
However, in spite of the great advances in Kamchatka's rural economy during the Soviet period it is still not meeting the basic requirement of the population in vegetables, potatoes, milk and meat. The harvest gathered in 1957, although it is to a considerable degree the result of improved agricultural methods, cannot as yet be considered a stable harvest. Milk production is the only phase which may be considered relatively stable. A wide range of measures must be taken in order to ensure steady growth in the supply of potatoes, vegetables, milk and meat to the population of Kamchatka.

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FIGURE 18

DISTRIBUTION OF THE AGRICULTURAL ESTABLISHMENTS

IN THE KAMCHATSKAYA OBLAST':



1. Vegetable - milk sovkhoses;
2. Reindeer - raising sovkhoses;
3. Subsidiary enterprises;
4. Rural - artels without reindeer;
5. (4) with reindeer;
6. Fur kombinats;
7. MTS

## The Rural Economy

### 1. Natural Possibilities for Development of the Rural Economy

The soil reserves and agriculture areas of Kamchatka are distributed in the following manner. Of Kamchatka's total area of 46 million hectares, agricultural areas take up 396.5 thousand hectares or 0.85%. Of these areas, ploughed fields amount to 12.75 thousand hectares (0.03%), hay meadows 277.5 thousand hectares (0.6%) and pasture takes up 106.3 thousand hectares (0.22%). The remaining lands are taken up by reindeer pastures, amounting to 34.4 million hectares (73%), forests make up 6.6 million hectares (14%), swamps and bogs take up 2 million hectares (4.4%) other lands amount to 2.7 million hectares (5.8%).

Most of the agricultural area is situated in the southern sector of the peninsula (326. thousand hectares) in the Elizovskiy, Mil'kovskiy, Ust'-Bol'sheretskiy, Sobolevskiy and Ust'-Kamchatskiy raions; the total area of these raions comes to 14.6 million hectares. In addition to these areas, there are additional preserves of land suitable for development, particularly for cultivation, in the amount of 31.5 thousand hectares including 7 to 8 thousand hectares in the Elizovskiy raion, 10.7 thousand hectares in the Mil'kovskiy raion, 7.0 thousand hectares in the Ust'-Kamchatskiy raion.

About 75% of the areas are in need of improvement (clearing, drainage, etc.) and therefore, a considerable amount of labor and equipment is required.

Local data show that the cost of developing one hectare of land under forest at present amounts to 2047 rubles, of this, the cost for brushing and skidding of the logs is 1217 rubles. However, these expenditures are not an obstacle in the path of developing new lands, since with proper farming practices the capital investments are normally recovered in the first two years. The peat bogs are of particularly great promise for development, their area amounts to 4.37 million hectares in Kamchatka. They are situated mainly on the western and eastern coasts. This is an enormous reserve of potential wealth for Kamchatka. Partial development of the peat bogs has already begun, it is being accomplished at one-fourth the cost of developing forested areas. According to data provided by the Kamchatskaya MTS, actual expenditures in the development of one hectare of Avachinskaya and Zakhrebetnaya tundra came to a total of 296 rubles. The peat bogs are also a rich source of organic fertilizer, which is much needed in Kamchatka farming.

A common shortcoming of the agricultural areas (cultivated, hay meadows and pastures) is their distribution, small size, their dissection by numerous streams, and therefore, their inaccessibility to mechanized cultivation and harvest. Somewhat of an exception to this are the fields and haymows of the Mil'kovskiy and Elizovskiy raions, where there are tracts of 20 to 50 hectares that are fully accessible and suitable for tractor work and machine harvesting.





Thus, the development of land into agricultural fields in Kamchatka requires a great deal of labour and enormous expenditures.

A more detailed description of the natural possibilities for development of the rural economy in Kamchatka is given further on in the text. Figure 19 shows the geographic location of zones.

The agrometeorological conditions of these zones are characterized by the indices in Table 51.

## 2. General Nature of the Rural Economy

Farming. The main crops grown in Kamchatka are potatoes, vegetables and fodder crops: a small amount of cereal grains are grown. The extent of cultivated areas given over to the different crops during the period of 1930-1957 is shown in Table 52.

The fastest growth tempo for planted areas is observed for potatoes and vegetables, this is in full accord with the tasks set for the development of the rural economy in Kamchatka. Areas under cereal and particularly under fodder crops grew significantly during the war and post-war years. This growth is the result of the necessity for creating a full-value fodder base for the growing dairy and hog industry.

The breakdown of sown areas in 1957 according to categories of enterprises is characterized by the data given in Table 53.

The hot house industry plays a great role in the rural economy in that of the total vegetable crop about 90% of the area is in nurseries. The building of hothouses was begun early in the development of vegetable raising. From 1930 through 1940 more than 10 thousand hotbed frames were built. By 1945, the number had risen to 18.5 thousand and by 1957 it was 45 thousand.

However, there is still a shortage of hotbeds in Kamchatka: 60 thousand are needed for the normal raising of nursery plants. Most of the hothouses available are worn out, about 50% of them require major repairs. This lowers the output of high quality nursery plants and, therefore, the crop harvest.

Second cropping in hothouses is carried on to a very limited extent and the most elementary principles of gardening are violated, this results in a low harvest (1-3 kilograms per frame). The total crop of hothouse vegetables amounts to no more than 500 to 700 centners instead of the possible 2.5 to 3 thousand centers.

The greenhouse industry of the Oblast' is in an embryonic state. Possibilities for developing it on the basis of utilization of hot springs has not been realized to this time. This question was raised as early as 1940, but it was not until 1957 that work has begun on the building of a greenhouse at the Nachikinskiy springs and one using technical fuel at the Petropavlovskiy sovkholtz (1 thousand sq. meters). The volume of construction in the hothouse-greenhouse economy of Kamchatka is inadequate and does not meet the needs of the population.

Instability and even lowered harvests of agricultural crops have been observed in the growth of cultivated areas, particularly in the post-war years (Table 54).

TABLE 51

AGRO-METEOROLOGICAL CHARACTERISTICS OF THE  
ZONES OF KAMCHATKA\*

Zones	Yearly- Average Temp. Degrees	Total heat in the period in which temp was over 10°	Length in days of warm period temp over 10°	Frost-free period, days	Total Precip. in mm	
					Yearly	Attemp. over 10°
South East Coast	2,0-3,1	1095-810	87-68	147-91	1119-783	399-306
Central	1-2,8	1285-795	95-60	67-49	436-357	140-138
West Coast	0,3-3,3	1075-515	96-48	125-62	636-369	248-210
East Coast	0,8-2,7	865-770	76-67	124-84	554-369	274-185
Northern	10,9-13,2	853-445	63-59	65-47	318-240	141-114

\* Data for extreme North & South points of zones.

TABLE 52

DYNAMICS OF SOWN AREAS IN KAMCHATKA BY CROPS  
FOR 1930-1957 (IN HECTARES)

Crop Group	1930	1932	1937	1940	1945	1950	1957
Total under crop	310	1450	2357	3273	6244	6983	10035
Incl:							
Grain	17	13	420	520	1415	1247	1558
Potatoes	255	573	1115	1834	3338	3490	3516
Vegetables	38	328	273	492	778	957	826
Fodders	-	536	549	427	713	1289	4135

TABLE 53

CROPPED AREAS BY CATEGORY OF ENTERPRISE IN 1957

Category of Enterprise	Total		Potatoes		Vegetable		Grain		Fodder	
	Hect.	0/0	Hect.	0/0	Hect.	0/0	Hect.	0/0	Hect.	0/0
Kolkhoz	4304	100	716	17	297	7	1440	34	1852	42
Sovkhoz	3113	100	579	19	331	11	93	3	2110	67
Subsidiary Enterprise	679	100	366	54	115	17	25	4	173	25
Individual Enterprise	1938	100	1855	96	83	4	--	--	----	--
Total	10035	100	3516	35	826	8	1558	16	4135	41



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TABLE 54

YIELD OF AGRICULTURAL CROPS BY ENTERPRISES

(IN CENTNER/HECTARE)

BY YEARS

Category of Enterprise and Crop		1940-1945	1950-1955	1955	1956	1957
Sovkhozos	Potatoes	49,0	27,6	20,0	57,0	60,0
	Vegetables	88,3	42,2	48,0	85,0	119,0
Subsidiary	Potatoes	35,0	28,6	34,0	42,0	60,0
	Vegetables	89,0	40,0	78,0	84,0	119,0
Kolkhozos	Potatoes	71,0	30,4	27,0	65,0	85,0
	Vegetables	101,0	78,2	106,0	156,0	252,0

TABLE 56

DYNAMICS OF LIVESTOCK HERDS IN KAMCHATKA (THOUS OF HEAD)

BY YEARS

Species	1940	1945	1950	1957
Cattle	10,7	16,7	21,8	21,8
Swine	17,6	3,7	8,6	16,8
Sheep & Goats	0,3	0,4	1,9	0,5
Reindeer	143,1	196,9	193,5	120,4
Horses	5,0	5,0	6,2	6,7
Fowl				101,0

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TABLE 57

RATIO OF LIVESTOCK BY ENTERPRISES

AT THE END OF 1957 (0/0)

Category of Enterprise	Cattle	Cows	Swine	Sheep & Goats	Fowl	Rein-deer	Horses
Sovkhozes	22,0	19,0	15,0	9,0	12,0	40,0	17,8
Subsidiary & other co-ops	14,0	12,0	21,0	---	---	---	53,5
Kolkhozes	18,0	16,0	7,0	71,0	4,3	50,0	26,7
Incl Sel'khozartels	14,0	11,0	6,0	71,0	4,3	33,0	---
and fishing artels	4,0	5,0	1,0	---	---	17,0	---
Kolkhozniks, workers	9,0	9,0	4,0	---	17,5	6,0	---
Workers in towns & villages	37,0	44,0	53,0	20,0	66,2	4,0	2,0
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0
* Ratio of Sheep, Goats & Fowl for 1956							

Mechanization of the rural economy is of primary importance under the conditions in Kamchatka. By the way, the present state of mechanization does not meet the tasks and requirements of agricultural production. The tractor fleet at the Sovkhozes and the MTS has not been overhauled in a long time, the available tractors are not equipped with a sufficient number of implements. There is a general shortage of suitable implements for such laborious tasks as breaking new ground, cutting turf for fertilizer, sowing, cultivating and harvesting two crops, etc.

In 1957 the tractor fleet at the Sovkhozes amounted to 99 units and at the MTS it was 105 units (of 15 sizes). Had these tractors been equipped with the appropriate implements for cultivation it would have been possible to considerably ease the task of the labour force and to improve farming. Incidentally, at the present time much of the field work at the Sovkhozes and Kolkhozes is done by hand and a large number of workers and staff from the cities and towns are employed, these are not particularly adept at agricultural work.

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Livestock Raising. Livestock raising in Kamchatka supplies the population with milk, dairy products and meat. Productive livestock raising is represented by cattle raising, swine herding, sheep herding, reindeer herding and poultry raising. The dynamics of development of livestock raising is characterized by the data given in Table 56.

The distribution of stock by category of enterprise is given in Table 57.

The share of the enterprises of the socialistic sector are: cattle 54%, cows 47%, hogs 48%, hogs 47%, reindeer 90%, fowl 16.3%, sheep 80%. The socialistic sector has not yet taken up the dominant position in the most important branches of livestock raising.

There is generally a lack of quality in the livestock due to the intensive growth in all types of livestock population. Thus, in the sovkhoses of the Ministry of Rural Economy in the RSFSR, the average milk output dropped in the post-war years from 2,000 kg to 1,600 and 1,700 kg per cow and it was not until 1956 that it again rose to 2019 kg. In individual sovkhoses the best cows produce high outputs, up to 3500 kg. At the sel'khozartels, the average milk output per grazing cow increased by nearly double its amount since 1940 and by 1956 it has reached 1600 kg.

The indices of milk production improved somewhat in 1956. Thus, at six vegetable-dairying sovkhoses, the milk output per foraging cow was increased to 2163 kg, or 14% over 1956, at the sel'khozartels, it was raised to 2074 kg, or 30% over 1956. However, Kamchatka has utilized far from all her possibilities for improving the output of dairy stock, this is confirmed by the milk volume which has been achieved by the leading milkmaids at sovkhoses and kolkhoses.

The indices for herd reproduction and the output of meat production in the Kamchatka Oblast' are also at a low level. The commercial output of young stock per 100 head of breed stock at the sovkhoses and kolkhoses was approximately the same during the past four years and amounted to 67-72 calves and 890 piglets. The average daily increase in hog weight varied from 130 to 202 gm. at the sovkhoses in 1956, and the production of pork varied from 7.1 to 15.3 kg per centner of concentrate. The reduction in numbers of young stock is significant, this amounts to 14% of total head at the Kolkhoses.

The gross yield of livestock products by categories of enterprise is given for 1953 through 1957 in Table 58.

The milk yield for the past three years has grown by 7.5% to 10% yearly. This growth is due mainly to the socialistic enterprises, whose ratio in milk production has increased from 26.6% in 1953 to 40% in 1956.

The volume of output of livestock products remains low and does not meet the requirements of the population. According to local estimates, the per capita output of products was as follows in 1956: milk 60 kg, meat 12.2 kg, this included 7.2 kg of reindeer meat, and eggs 1.2 per person. Local milk, according to estimated norms, meets only about 45% of the needs of the population, meat meets 20% of their needs and eggs 4 to 5%.

TABLE 58

GROSS OUTPUT OF LIVESTOCK BY ENTERPRISES

Product & Category of Enterprise	1953		1955		1956		1957	
	Thous. tons	0/0	thous tons	0/0	thous. tons	0/0	thous. tons	0/0
Milk - Total.....	16,8	100	18,8	100	20,2	100	22,4	100
Incl: Sovkhozes	1,52	9,0	2,2	12,0	3,1	15,4	4,0	18,1
Subsidiary								
Enterprises.....	1,06	6,3	1,4	7,0	2,2	10,8	3,1	13,4
Sel'khozartus.....	1,2	7,1	2,4	13,0	1,75	8,7	2,5	11,2
Fishing								
Artels.....	0,72	4,2	----	-----	0,61	3,0	0,65	2,9
Individual								
Sector.....	12,3	73,4	12,8	68,0	12,5	62,1	12,2	54,4
Meat - Total.....	4,6	100	4,8	100	4,82	100	5,4	100
Incl: Sovkhozes.....	2,4	52,5	1,9	39,0	1,8	37,5	1,3	25,0
Subsidiary								
Enterprises.....	0,35	7,7	0,4	9,0	0,42	8,7	0,6	11,0
Sel'khozartus	0,22	4,8	1,2	25,0	0,8	16,5	0,8	18,7
Fishing								
Artels.....	0,32	7,0	----	-----	0,5	10,3	0,5	11,4
Individual								
Sector.....	1,28	28,0	1,3	27,0	1,3	27,0	2,2	33,9

The richest local source of concentrated and vitaminic fodders in fish refuse, it is far from sufficiently utilized as feed. 215 to 319 thousand centners of fish refuse is produced in Kamchatka, but no more than 50-55 thous. centners of this refuse is used in the production of fish meal. The cost of fish meal is high, up to 5 rubles per kg. The use of fish refuse as feed in an unprofitable way complicates the difficulties of its procurement.

One of the most important reasons for the backward condition of livestock raising is the poor stabling of stock; there are insufficient shelters for the animals. In 1956, 455 cows were not stabled at the sovkhoses. The available stock pens are old, the majority of them do not meet zootechnical requirements. There is an almost complete absence of any mechanization whatsoever. Thus, self-watering had been introduced for 528 head at the sovkhoses and for 500 head at the Kilkhoses. There is a total of 8 sets of miling apparatus. Widespread building of standard animal shelters during the past three or four years at the sovkhoses and kilkhoses does not fully meet the requirement.

Breeding practices have been neglected. The ratio of cows does not exceed 38%, this lowers the total yield of meat and particularly of milk, which are the main types of animal produce in Kamchatka.

The breeding farms at the Kilkhoses are ordinary commercial farms. There is no systematic work in livestock judging. Selection of breeding stock and proper training in the selection of replacement stock is not carried out. Besides this, one of the most serious shortcomings of local livestock-raising is the widespread barrenness of cows.

### 3. Distribution and Specialization of the

#### Rural Economy

The character of natural conditions and the distribution of population have determined the distribution and specialization of the rural economy in Kamchatka. The following natural-economic agricultural zones may be distinguished.

I The Southeastern Zone (Petropavlovsk and Elizovskiy raion). This is a zone of potato and vegetable growing, dairying, hog raising, poultry raising and fishing in the fishing artels).

II The Central Zone (Mil'kovskiy raion). This is a zone of fishing, dairying, potato and vegetable growing, hog raising, reindeer raising (Tigil'skiy raion) and fur trade.

III The West Coast Zone (Ust'-Bolsheretskiy, Sobolevskiy and Tigil'skiy raions). This is a zone of fishing, dairying, potato and vegetable growing, hog raising, reindeer raising (Tigil'skiy raion) and fur trade.

IV The East Coast Zone (Ust'-Kamchatskiy and Karaginskii raions). This is a zone of dairying, potato and vegetable growing, hog raising (Kamchatka river valley), fishing, dairying, reindeer raising (Karaginskii raion) and fur trade.

V The Northern Zone (Penzhinskiy, Olyutorskiy, Bystrinskiy and Aleutskiy raions). This is a zone of reindeer raising, fishing and fur trade, dairying and vegetable raising of a consumer nature.

Table 59 presents data concerning the extent of agricultural production in the Oblast' by zones and raions as of 1957.

The ratio of individual zones in the agricultural production of the Oblast' is shown in Table 60.

#### 5. The Basic Problems of the Future Development of the Rural Economy in Kamchatka.

The Kamchatskaya Oblast' has the task of developing local agricultural production to the extent that it would fully meet the needs of the population: in the next ten to 15 years the population of Kamchatka will grow by 36% and thereby the urban population will increase by 59%.

In order to fulfill the assigned task under these conditions it is necessary to sharply increase the volume of agricultural production in the future. An estimate of requirements in agricultural products is given below, the factors used are population numbers for the future period and the accepted norms per person.

Footnote: The accepted norms are the following: potatoes 120 kg, vegetables 100 kg, milk 120 kg and meat 28 kg per year. Allowances were made in these norms for local conditions and local availability of certain foods for example certain vegetables and the ratio of meat and fish in the diet. (End of Footnote.).

Also taken into consideration were the requirements of feed for stock and other reproductive needs (seed, etc.). The necessary gross yield of agricultural products in the future is outlined by the figures in Table 71.

A considerable increase in the cultivated areas under fodder crops is expected, with consideration of the stringent situation in the existing feed balance, the possible high production and economic effectiveness, as well as of the low productivity of natural feed areas. Account is also taken of the necessity for a sharp increase of roots and green fodder in the feed ration.

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TABLE 59

VOLUME OF AGRICULTURAL PRODUCTION BY ZONES & RAIONS

Zone	Raion	Sown Areas, Hectares;					Head of Cattle			
		Total	Potatoe	Vege table	Grain	Fodder	Cattle	Swine	Rein deer	Horses
I	Total	5396	1759	403	659	2575	7706	7198	-	1138
	Petropvavlovsk	1164	697	128	37	302	1932	3786	-	296
	Elizovskiy	4232	1062	275	622	2273	5774	3412	-	842
II	Total, Millkovskiy	1816	346	90	877	503	1804	1755	-	812
III	Total	1581	748	203	-	630	7714	3291	19820	2726
	Ust-									
	Bol'sheretsriy	970	418	120	-	432	3912	1948	-	1281
	Sobolevskiy	447	288	60	-	169	2565	924	-	880
	Tigil'skiy	164	112	23	-	29	1237	419	19820	565
IV	Total	1055	547	106	-	402	3635	4064	6435	1313
	Ust'-									
	Kamchatskiy	944	462	92	-	390	2836	2854	-	1004
	Aleutskiy	3	3	-	-	-	117	41	947	17
	Karaginskii	108	82	14	-	12	682	1169	5488	292
V	Total	187	116	24	22	25	659	533	94143	739
	Penzhinskiy	10	5	5	-	-	110	54	53729	94
	Olyutorskiy	84	69	15	-	-	641	384	25024	301
	Bystrinskiy	93	42	4	22	25	208	95	15390	344
	Total for the Oblast'	10035	3516	826	1558	4135	21818	16841	120398	6728

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TABLE 60

RATIO BY ZONES IN THE OUTPUT OF AGRICULTURAL PRODUCTS IN KAMCHATKA

Indices	Units of Measure	ZONES					
		I	II	III	IV	V	Throughout the Oblast
All Territory of the Oblast	0/0	9,0	5,4	23,5	15,0	47,1	100
Agricultural Lands	0/0	18,0	20,0	36,0	18,0	8,0	100
Population, Total	0/0	48,0	4,4	27,7	16,6	6,3	100
Incl. urban	0/0	59,9	-	21,9	17,2	1,0	100
Sovkhozes	Unit	5	-	2	1	4	12
Rural Artels	Unit	5	7	8	-	4	24
Fishing Artels	Unit	4	-	23	17	8	52
Subsidiary Enterprises of the Kamchatskiy Sovnarkhoz	Unit	8	-	10	8	3	29
Total area planned (1957)	0/0	54,0	18,0	16,0	10,0	2,0	100
Under Potatoes	0/0	51,0	10,0	21,0	15,0	3,0	100
" Vegetables	0/0	48,0	11,0	25,0	13,0	3,0	100
" Grain	0/0	42,0	54,0	1,0	1,0	2,0	100
" Fodder	0/0	62,0	12,0	15,0	10,0	1,0	100
Agriculture animals head at end of 1956							
Cattle, Total	0/0	35,3	8,3	35,3	16,7	4,4	100
Incl. cows	0/0	35,3	7,6	33,2	19,0	4,9	100
Swine	0/0	36,2	11,2	23,1	24,4	5,1	100
Sheep, Goats	0/0	23,3	76,1	-	0,6	-	100
Reindeer	0/0	-	-	17,6	4,9	77,5	100
Gross output	0/0						
Potatoes	0/0	50,1	9,9	21,2	15,5	3,3	100
Vegetables	0/0	61,6	5,9	14,1	12,1	6,3	100
Milk	0/0	36,7	7,3	31,1	17,0	7,9	100
Meat (Less Reindeer)	0/0	28,3	8,6	25,5	30,5	7,1	100
Reindeer Meat	0/0	-	-	10,1	-	89,9	100
All Meat	0/0	13,0	4,5	18,7	17,0	46,8	100



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TABLE 71

GROSS OUTPUT OF AGRICULTURAL PRODUCTS IN THE FUTURE PERIOD

TYPE OF PRODUCT	UNIT OF MEASURE- MENT	AVERAGE FOR 1955-57	IN THE FUTURE PERIOD	
			ABSOLUTE	O/O OF AVERAGE FOR 1955-57
Potatoes	Thous tons	35,6	67,0	190
Vegetables	"	10,0	35,0	350
Milk	"	20,8	43,0	207
Total meat, live weight	"	5,3	12,2	230
Dressed meat by weight	"	3,0	7,5	
Eggs	Millions	3,4	12,0	353

TABLE 72

PROSPECTS FOR SOWN AREAS

CROP	1957 THOUS. HECTARES	FUTURE PERIOD	
		THOUS OF HECTARES	O/O of 1957
Total Sown Area	10,0	30,0	300
Incl: Potatoes	3,5	4,8	137
Vegetables	0,83	1,6	193
Grain	1,24	7,5	600
Fodder			
Crops	4,43	16,1	364

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TABLE 73

AGRICULTURAL CROP YIELDS IN THE FUTURE PERIOD  
(IN CENTNERS/HECTARE)

CROPS	AVERAGE YIELD 1954-1957 (ACTUAL	FUTURE PERIOD	
		AVERAGE YIELD	FLUCTUATIONS BY ZONES & CATEGORIES OF ENTERPRISES
Potatoes	85,0	140,0	110-150
Vegetables	99,0	225,0	130-300
Grain	7,0	15,5	15-165
Root crops	50,0	200,0	130-220
Annual Grasses	12,0	20,0	15-30
Perennial Grasses	15,0	25,0	20-30

TABLE 74

NUMBER OF HEAD OF PRODUCTIVE LIVESTOCK IN THE  
FUTURE PERIOD

SPECIES OF ANIMAL	1957 THOUS. HEAD	FUTURE PERIOD	
		THOUS. HEAD	O/O OF 1957
Cattle/Livestock	21,1	32,0	152
Incl. Cows	9,6	15,0	156
Swine	16,0	30,0	187
Reindeer	120,4	180,0	140
Fowl	101,0	250,0	250

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The increase in sown areas under cereal and fodder crops, in particular under annual and perennial grasses, is conditioned also by the development of large areas of new land on which these crops must become a part of the rotation cycle. The plenitude of cultivated areas of new land on which these crops must become a part of the rotation cycle. The plenitude of cultivated areas and of a soil reserve suitable for development fully assures the planned extension of sown areas for the future period. There may be some problems in the development of new lands. This may be due to the lack of information concerning the soil reserves which will complicate the selection and proper use of land areas.

A well-known obstacle is the shortage in the labor force and the high cost of labor. However, experience has shown that all these difficulties are surmountable by contemporary technology and all the means used will be justified in a short time.

It is necessary to organize large scale hothouse-greenhouse enterprises covering an area of 100 thousand square meters for the purpose of raising greens, heat-loving vegetables (tomatoes, cucumbers, etc.) as well as nursery plants.

Fruit and berry growing must also be extended; Kamchatka has the necessary conditions for this purpose.

The future, planned volume of agricultural production is based on the average indices for harvest yields given in Table 73.

The future yield accepted for the basic crops exceeds the actual average yield for the past three years by 1.5 to 2 times. The possibility of achieving such a high yield is confirmed by the standard of yield obtained at the leading enterprises in the Oblast' at the present time.

The increase in numbers of stock during the next 10 to 15 years is estimated within the limits given in Table 74.

In estimating the numbers of cattle for the future period, consideration was given to the great need for milk as this is the most important type of livestock product in Kamchatka. A high ratio of cows in the herds was established in connection with this, about 50%.

The number of hogs was determined on the basis of the maximum possible use of local feed. It is planned to raise hogs of the pork and lard types. More extensive hog raising is not discounted, should an adequate feed base be set up locally which would increase profitable production of pork.

Insofar as numbers of reindeer are concerned, this figure was determined on the basis of the capacity of reindeer pastures in the main reindeer in the future will be relatively reduced. Although at the present time the ratio of reindeer meat is 55% of all meat produced, in the future it will amount to no more than 29%. In connection with this the ratio of pork will increase from 29 to 50%.

Poultry flocks will increase by  $2\frac{1}{2}$  times, this must be taken as the minimum for the future period. A considerable increase in the productivity of livestock is foreseen (Table 75).

The achievements of leading enterprises, individual brigades, teams, workers engaged in livestock raising, as well as the above analysis of internal resources and production capacity, provide convincing proof of the reality of the indices used.

The estimates given must not be taken as planning figures. They must be considered as examples, the purpose of which is to show how the problem concerning the development of Kamchatka's national economy can be approached.

TABLE 75

PRODUCTIVITY OF LIVESTOCK IN THE FUTURE PERIOD

TYPE OF PRODUCT	UNIT OF MEASUREMENT	AVERAGE PRODUCTIVITY 1958-1959 (ACTUAL)	FUTURE PERIOD	
			AVERAGE PROD-ACTIVITY	FLUCTUATIONS BY ZONES & ENTERPRISES
Milk output per cow	kg	2000	2750	2500-3500
Meat output per 100 head (dressed weight)				
Cattle	Centners	60	75	60-80
Swine	"	70	200	150-225
Reindeer	"	12	20	15-25
Egg production per egg laying hen	Eggs	52	120	100-150

## CHAPTER VI

### THE HUNTING INDUSTRY

Hunting is the age-old occupation of the indigenous population of Kamchatka, it provides about 17% of their monetary income. A large quantity of sable are taken in Kamchatka. Besides sable, fox, otter and wolverine are taken as well as polar fox and seal. Wild reindeer, snow sheep (bighorn), bear and marine animals are game in Kamchatka.

Besides furs, the hunting trade provides such side products as bear meat, meat from the marine animals, wild reindeer, sheep, rabbits and wild fowl. This averages out at 100 to 150 kg per hunter per year. It somewhat increases the meat reserves in Kamchatka and reduces the necessity for importing meat into the peninsula.

There have been fundamental changes in the natural economy of the Oblast during the past 20 to 30 years. Hunting, as the result of the development of other branches of the economy, has lost its primary position in the Oblast's economy. However, it continues to be important. Hunting is next to fishing as a branch of communal industry. Kamchatka sable, fox, common fox, polar fox and seal occupy a strong position in the fur exports of the USSR. Otter and ermine are also exported. In the outlying raions, such as the Penzhinskiy and Bystrinskiy raions, furs are virtually the one trade commodity which is exported beyond their boundaries.

The ratio of individual species of animals in percent of the value of total furs taken for the period 1950-1957 is given below.

Sable	70%
Fox	19%
Ermine	5.3%
Otter	4.0%
Rabbit	0.3%
Bear	0.3%
Wolverine	0.3%
Squirrel	0.3%
Wolf	0.2%
Polar fox)	
Lynx )	0.3%
Marmot )	
Badger )	
<hr/>	
TOTAL	100.0%

Sable, fox ermine and otter are the main targets of the hunting trade in Kamchatka. The remainder of the fur-bearing animals (wolverine, squirrel, wolf, lynx, badger and marmot) are not of much importance. Insofar as brown bear and rabbit are concerned, their importance is not determined so much by the value of their pelts, as by the value of their meat, which is not reflected in this Table.

## 2. Hunting Areas and their Productivity

The Kamchatskaya Oblast' may be divided into the three following hunting areas: the peninsula itself, the Karaginskiy Ostrov and the Continental part of the Oblast'. (Kommandorskiye Ostrova and their specific marine hunting is not dealt with here).

1. The Kamchatka peninsula is an independent zoogeographic raion, its fauna is of an insular character, while many of the forms have developed into well defined subspecies. There are 27 species of mammal here, many of which (sable, fox, otter, bear, snow sheep, wild northern reindeer and others) are of great economic interest. The best hunting areas are the mountain and low-lying forests and the low-lying and flatland birch stands.

The following sectors of the peninsula are outstanding:

(a) The central part of the Kamchatka river valley with a preponderance of larch-birch and spruce-larch-birch forests. This raion is characterized by the highest density of sable, a plenitude of squirrel and comparatively small numbers of fox.

(b) The Western Seacoast of the peninsula, with great areas of seaboard tundra, meadows and bogs. This raion is famous for its large fox population, it produces 40% of all the furs taken in the Bolsheretskiy and Sobolevskiy raions.

2. The Karaginskiy Ostrov is characterized by its preponderance of coastal hunting areas and the highest ratio output of fox in the Oblast' (0.62 head per 1000 hectares).

3. The Continental sector (Penzhinskiy and Olyutorskiy raions) relates to the transitional forest-tundra zone. Squirrel, lynx and chipmunk inhabit this area. Moose and flying squirrel penetrate the area from the northwest. On the whole this sector of the Kamchatskaya Oblast' is characterized by a preponderance of fox (approximately 50% of the value of furs taken).

The following sub-raions are defined in the Continental sector:

(a) the headwaters of the Penzhinskiy river, where squirrel are very numerous in the larch forests. Sable introduced into the area will occupy a leading position in the fur trade within the next few years;

(b) the Apukskiy sable "breeding ground", with the prospect of taking 50 to 70 sable per year;

(c) the remainder of the Olyutorskiy raion territory with its preponderance of brush covered areas and an average production of fox of 0.09 head per 1000 hectares of hunting area;

(d) the remaining territory of the Penzhinskiy raion with its preponderance of open areas and low fox population (0.04 head per 10000 hectares of hunting area).

The dissimilarity in the hunting areas determines their differences in output (Fig. 22). Differences in the intensity with which the hunting trade is carried on is of secondary importance.

The greatest output of furs (3-400 ru les per 1000 hectares of hunting area) comes from the raions adjacent to the Kamchatka river valley. The continental raions and the eastern sector of the Karaginskiy raion have the lowest output, producing 10 to 25 rubles worth of fur per 1000 hectares of hunting area.

### 3. Present Condition of the Hunting Industry and Measures for its Future Development.

The present condition of the hunting industry is characterized by planned exploitation of areas, increases in the reserves of sable, and growth of overall fur output. The last-named grew from 3480 thousand rubles in 1950 to 4259.9 thousand rubles in 1957. The yearly take of furs per hunter increased in value during this period from 3000 to 5400 rubles, i.e., by 1.8 times.

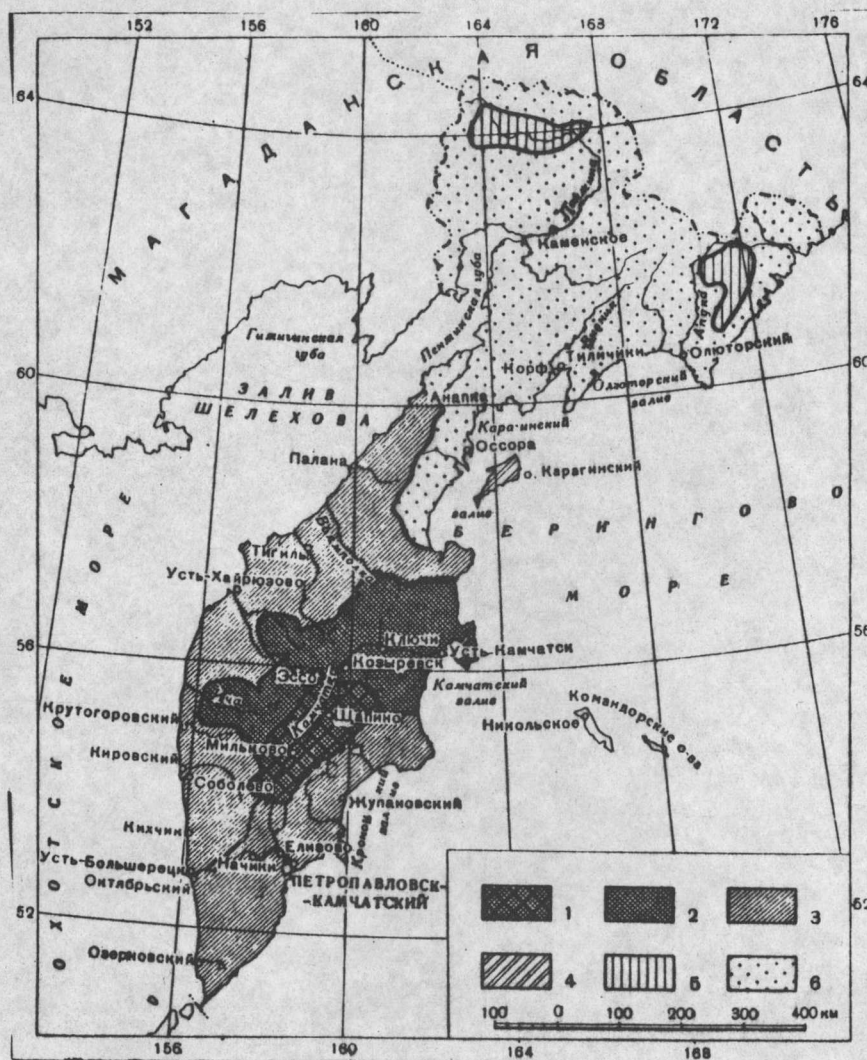
In those raions where there is large scale hunting for sable, such as the Milkovski, Ust'-Kamchatskiy, Tigil'skiy and Bystrinskiy raions, a large part of the Elizovski, Bol'sheretskiy and Sobolavskiy raion territories and the southern half of the Karaginskiy raion, as well as the Karaginskiy Ostrov, the take of furs per hunter at the present time amounts to 6.0 to 9.5 thousand rubles for the season, or 1.5 to 2 thousand rubles per month.

However, present growth of fur output has a unilateral tendency (towards sable). The take of other furs has absolutely and relatively decreased. The yearly average take of fox during the past eight seasons has amounted to 68% of the average for the period 1935 to 1942 and only 53% of the average for the period 1925-1935. The take of ermine has decreased by 29% during the past ten years and that of rabbit by 36%. The output of squirrel has decreased from 3.5 - 4 thousand skins in 1950 down to 2.4 thousand skins in 1957. The main reason for this reduction is the decrease in number of hunters, a change in their force, and the poor organization and low pay of their work.

The number of hunters decreased from 1500 in 1945 to 950 in 1956. There has been a simultaneous change in the composition of their force (Table 77).

The decrease in numbers of hunters came about at the expense of the hunter-Kilkhovniks, the number of which was reduced to less than half. Insofar as seasonal hunters are concerned, their numbers have increased considerably.

The average earnings per hunter in the southern regions of Kamchatka, where the main hunting target is sable, are considerably greater than in the northern regions (Penzhinskiy and Olyutorskiy) where mainly fox is taken. During the 1956-1957 season the average value of the take per hunter in the Mil'kovskiy raion came to about 9.5 thousand rubles, that in the Tigil'skiy and Southern Karaginskiy raions to about 4.5 thousand rubles, while in the Penzhinskiy and Olyutorskiy raions it did not exceed 1.0 to 1.5 thousand rubles.



PRODUCTIVITY OF HUNTING GROUNDS IN THE KAMCHATSKAYA OBLAST'.

Production of fur per 1000 hectares of hunting ground (in rubles): 1. 300-400; 2. 200-300; 3. 100-200; 4. 50-100; 5. 25-50; 6. 10-25 rubles



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If account is taken of the hunter's expenses for equipment, weapons and ammunition, sled and hunting dogs, which amounts to 44% of the value of furs taken in the Pezhinskiy raion, then it is seen that the income from the hunting trade in the north of the Kamchatskaya Oblast' is insignificant. As a result of this, hunting for furs of little value such as fox, ermine and other animals is not profitable. It is therefore necessary to review the costs and methods of hunting for various types of animal.

TABLE 77

HUNTERS IN KAMCHATSKAYA OBLAST'

GROUP	1945		1956	
	NUMBER	O/O	NUMBER	O/O
Hunters - Kolkhozniks	1275	85	580	61
Seasonal Hunters	225	15	370	39
Totals	1500	100,0	950	100,0

TABLE 78

COMPARATIVE WORK PRODUCTIVITY OF A HUNTER IN THE  
1955/56 WORKING YEAR

TYPE OF PELT	VALUE IN RUBLES*	WITH DOG- TEAM		WITHOUT DOG-TEAM		DIFFERENCE	
		ITEMS TRAPPED	RUBLES	ITEMS TRAPPED	RUBLES	ITEMS TRAPPED	RUBLES
Sable	360,0	24,4	8784,00	6,0	2160,00	18,4	6624,00
Fox	150,0	3,3	495,00	1,5	225,00	1,8	270,00
Ermine	13,5	15,3	206,55	3,2	43,20	12,1	163,35
Otter	157,6	2,5	394,00	0,6	94,56	1,9	299,44
Rabbit	3,6	2,3	7,28	1,5	5,40	0,8	1,88
Total	-	-	9886,83	-	2528,16	-	7358,67

\* 2nd Class Average Size

The advantages to hunters equipped with dog transport can be seen from Table 78, which shows comparative indices for work productivity of hunters.

Without subtracting the cost of maintenance of dogs, the hunter who has sled transport earns nearly 4000 rubles more than the hunter who does not have dogs. For this reason the indigenous population always used dog transport in hunting. By the way, there is alarm concerning the state of dog breeding in the Oblast'. In the Tigil'skiy raion one-third of the hunters do not have dog-teams. In the Karaginskiy raion the dog population amounts to 4 and 5 dogs per hunter, instead of the necessary eight to ten dogs. In 1945, in the Olyutorskiy raion there were more than 2500 sled dogs, while at the present time there are less than 1500. In association with this the breed, and therefore, the performance qualities of sled dogs has been lowered. All this makes it necessary to improve the transport equipment for hunters.

## CHAPTER VII

### Local Manufacture of Consumer Goods

The local industry of the Kamchatskaya Oblast' is characterized by an insignificant volume of output and irregular growth tempo, as can be seen from Table 79.

The rate of growth of output for Kamchatka's local industry during the fifth five-year plan was higher than the average for the USSR (99.5% as against 76% for the average throughout the Soviet Union). However, this must not be considered sufficiently high, since local industry in Kamchatka is still in the initial stages of development.

The local industry establishments are represented by a small semi-primitive type of shop, located in quarters which are not suited to production.

There are 11 establishments engaged in production of consumer goods. Five of these are located in the city of Petropavlovsk: the gor'pishchekombinat (city food-packing enterprise) with shops for producing beer, non-alcoholic drinks, wine-vodka preparations, confectionery and sweets; a bakery producing, in addition to bakery goods, farinaceous and macaroni foods; a sausage plant; a raipromkombinat (regional industrial enterprise), providing everyday services, which engages in tailoring and mass production of clothing, shoe repairs and a variety of everyday services to the population; a gorpromkombinat (city industrial enterprise) which engages in shoemaking, furniture manufacture, etc. The remaining establishments are situated in the raion centers at Elizovo, Ust'-Bol'sheretsk, Ust'-Kamchatsk, Mil'kovo, Tilichiki and Ossora.

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TABLE 79

INCREASE IN GROSS PRODUCT OF LOCAL INDUSTRY

KAMCHATSKAYA OBLAST'

YEAR	VOLUME MILLIONS RUBLES	INCREASE	
		O/G OF PREVIOUS YEAR	IN O/O OF 1950
1950	34,5	-	100,0
1951	43,5	126,1	125,8
1952	46,4	106,7	134,5
1953	50,4	108,6	147,3
1954	56,4	111,9	163,5
1955	68,8	122,0	199,5
1956	75,1	109,1	217,7
1957	78,9	105,0	229,0

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TABLE 80  
ESTIMATES OF THE CHARACTERISTICS OF LOCAL  
INDUSTRY ESTABLISHMENTS FOR 1957

ESTABLISHMENT	GROSS PRODUCT MILL. RUBLES	BASIC MENAS 1 JAN. 1956 MILL RUBLES		NUMBERS OF WORKERS EMPLOYEES		OUTPUT PER WORKER THOUS. RUBLES	AVERAGE PAY PER WORKER THOUS. RUBLES
		TOTAL	INCL. MACHINES & EQUIP- MENT	TOTAL	INCL. WORK- ERS		
<u>PETROPAVLOVSK</u>							
Everyday services Kombinat	14,0	2,0	0,3	351	283	51,2	9,5
City Industrial Kombinat	5,3	2,4	0,4	150	117	45,4	13,8
City Food Packing Kombinat	19,9	5,4	1,0	154	122	163,1	13,9
Sausage Plant	6,0	1,4	0,1	45	32	188,7	14,6
Sub-Total	72,2	17,9	3,7	912	724	99,5	12,0
<u>REGIONAL INDUSTRIAL ENTERPRISES</u>							
Elizovskiy	3,5	2,9	0,6	99	76	46,0	12,1
Ust'-Bol'sheretskiy	0,6	0,2	0,004	28	21	18,5	5,9
Ust'-Kamchatskiy	0,6	0,4	0,1	28	20	23,5	11,3
Mil'kovskiy	0,9	0,7	0,2	30	23	34,5	12,6
Olyutorskiy	0,9	1,2	0,006	37	28	29,7	12,1
Karaginskiy	0,9	0,3	0,03	37	32	21,4	10,4
Sub-Total	7,4	5,7	1,0	259	200	37,0	10,7
Total	79,6	23,6	4,7	1171	924	86,1	11,9
INCL. Establishments engaged in producing foodstuffs	52,9	13,5	3,0	411	324	163,0	13,6
Establishments pro- duce manufactured goods	26,7	10,1	1,7	760	600	44,5	11,0

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The raimpromkombinats produce industrial goods (building materials, timbers, furniture, etc.), they also engage in providing everyday services to the population (sewing and repair of clothing and footwear, repair of metal wares, furniture etc.) as shown in Table 80.

As can be seen from Table 80, the Petropavlovsk establishments occupy the leading position in production of consumer goods, the bulk output of these makes up 91.0% of the total volume of local industry production and about 80% of all workers are employed at these plants.

The present condition of local industry in Kamchatka is characterized by the main traits given below.

Total volume of output is not great, it is not great, it is about 4% of the gross output for the Oblast'. This low volume of output and low ratio of products for local consumption in the Oblast' (no more than 3%), does not meet the needs of the Oblast' in any one item.

In excess of 65% of the gross product (66.4% in 1957) is made up of foodstuffs and only 35% (33.6% in 1957) is manufactured goods.

Local industry is characterized by a low level of concentration of output, particularly in the regional industrial enterprises. In terms of labor force and equipment the enterprises in Kamchatka are considerably beneath the average establishment for local industry in the USSR.

The low work productivity is accounted for by the poor supply of technical equipment to the establishment and the unsatisfactory organization of production. Work is not organized according to operation at the enterprises. The result is that highly qualified workers perform simple tasks as well. Thus, in individual tailoring of clothing, one tailor makes the whole garment from beginning to end, regardless of the type of the garment. In this case a tradesman of the sixth and seventh rank sews on the buttons and trims the seams himself. It must be noted that the majority of shops in the country, including those in the Magadanskaya Oblast' went over to the brigade method of tailoring clothing a long time ago, this raised productivity of labor by several times. There is no division of labor according to operation in the furniture industry, and the shoemaking industry is insufficiently well organized. There is a great deal of hand labor because of the lack of bench equipment at the enterprises. This is particularly true at the sausage plant in the preparation of meat for sausage foods, and at the Petropavlovsk food-packing establishment in the preparation of confectionery goods.

The poor state of equipment at the enterprises is characterized by the fact that for 23.6 million rubles worth of goods produced by the first of January 1958, the value of machines and equipment totalled 4.7 million rubles. This means that for one ruble of basic equipment on the average for the Oblast' there was produced three rubles 34 kopecks of gross product with fluctuations at individual enterprises to 6 rubles 12 kopecks. (The Petropavlovsk everyday-services establishment) to one ruble 05 kopecks (Karaginskiy regional kombinat).

The productivity of labor in industry under local control is lower than it is in the branches of industry under Soviet control (on the whole, approximately 20%, while in terms of industrial goods, it is 40%). It must be observed in connection with this that a considerable part of the items made locally are evaluated according to local prices, which are higher than the Soviet optimum-selling prices, as a result of which the volume of gross product, and therefore the indices of productivity of labor are somewhat elevated. The considerably higher productivity of labor in foodstuffs (on the average per labourer it was 163.0 thousand rubles of gross product) is accounted for by the basic standard of values. The growth rate of productivity of labor in Kamchatka during the fifth five-year plan was somewhat lower than it was on the average for the Soviet Union (22% as against 36%).

The ratio of management and services staff in the total labor force is very high. Thus, in 1956, the workers in the labor force comprised 76.6% of the total, as opposed to the average for the Soviet Union of 82% (1955). Such a ration results in large overhead costs, considerably raising the cost of the product.

Production of consumer goods in Kamchatka is insignificant in both quantity and in variety (Table 81).

TABLE 81  
OUTPUT OF MAIN TYPES OF GOODS BY LOCAL  
INDUSTRY ENTERPRISES IN 1957

TYPE OF PRODUCT	UNIT OF MEASURE	OUTPUT	RATIO IN GROSS OUTPUT OF CONSUMER GOODS, o/o
Sewn good	Thousands	16025	87,7
Incl. Mass Produced	of Rubles	7500	41,1
New Footwar	Thous. pairs	9,6	4,6
Leather Marking	Thous. rubles	449,1	2,5
Incl. Upper leathergoods	Decamter	250,6	-
Rough leathergood	squared	2,3	-
Furniture	tons	786	4,2
Metalware	thousands of rubles	183	1,0
Other Products, Incl Brick, wood timber, etc. and repair services		8300	-

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TABLE 82

OUTPUT OF MAIN TYPES OF MANUFACTURED GOODS  
BY ENTERPRISES OF THE LOCAL INDUSTRY IN 1957

PRODUCT	UNIT OF MEASURE	OUTPUT
Bread & Bakery Goods	Thous tons	12,9
Macaroni Foods	Tons	861,4
Confectionery	"	471,9
Beer	Thous of Decalitres	94,9
Non-Alcoholic Beverages	"	47,9
Wine-Vodka Products	"	42,1
Sausage Foods	Tons	427,0

TABLE 83

STRUCTURE OF PRODUCTION COSTS IN THE SEWING  
AND FOOT-WEAR INDUSTRIES IN KAMCHATKA & THE AVERAGE  
FOR THE USSR (IN 0/0).

COST STAGES	SEWING INDUSTRY		FOOTWEAR INDUSTRY	
	KAM-CHATKA	AVERAGE USSR	KAM-CHATKA	AVERAGE USSR
Raw materials, Fuel, Energy	71,6	90,3	58,9	85,1
Wages & extra pay	17,8	5,9	25,8	9,3
Shop & Overhead Expenses	10,6	3,4	15,3	5,4
Outside Expenditures	-	0,4	-	0,2
Total	100,0	100,0	100,0	100,0

The bulk of the consumer goods produced are tailored articles (87.7% of gross product), individual sewing predominates. Mass production techniques in sewing are very poorly developed. Items made are bedding and underwear, padded jackets and trousers, but even in these items the requirements of the Oblast' are not met by local industry.

Footwear produced consists only of boots and a variety of slippers, these are very expensive, since they are evaluated according to local prices.

Furniture is produced in greatest variety, but it is of low quality and also very expensive. The output and variety of foodstuffs in Kamchatka is also small (Table 82).

As the table shows, the production of foodstuffs is insignificant and the variety is insufficient. It is necessary to ship all types of consumer goods into Kamchatka, with the exception of bakery products, beer and non-alcoholic beverages.

In 1957, the population of Petropavlovsk alone purchase sausage products in the value of 12,505 thousand rubles, milk (including dried and canned) and milk products in the amount of 10,848 thousand rubles, headgear in the amount of 1366 thousand rubles, leather footwear in the amount of 15713 thousand rubles, furniture - 1690 rubles, etc.

Most of these goods can and must be produced locally. Raw material for the production of these goods can be both local and imported.

At the present time all consumer goods, with the exception of footwear and furniture, are made out of imported raw materials. In addition, local materials, for a number of enterprises must be brought in from a considerable distance. Thus, timber for manufacture of furniture in Petropavlovsk and Elizovo comes from the Kamchatka river basin. As a result of high transportation costs, the value of raw materials at the kombinats proves to be very high. For example, a cubic meter of Kamchatka timber costs 312 rubles at Ust'-Kamchatsk, while at Petropavlovsk and Mil'kovo it costs 700 rubles; a square decimetre of non-ferrous chrome costs 1 ruble 36 kopeeks at Elizovo, while at Petropavlovsk it costs one ruble 38 kopeeks and at Tilichiki it costs two rubles 12 kopeeks. Transportation costs for bringing raw materials and fuel are most significant. This considerably increases the cost of goods and occasionally makes their production unprofitable. The cost of goods is increased for other reasons besides transportation costs. Examination of costs by stage of expenditure shows that in Kamchatka, as in other regions of the Northeast, these are higher than they are in the central Oblasts and on the average for the Soviet Union.

Table 83 gives a comparison of the cost structure for identical branches of industry in Kamchatka and on the average for the Soviet Union.



As can be seen from the comparison, in spite of the considerable increase in cost of raw materials in Kamchatka, their ratio in the costs is lower than the average for the country. However, wages are considerably higher. This is accounted for, on the one hand, by the low level of technical equipment at the enterprises and hence the requirement for a great deal of hand labor in production, and on the other hand by the system of pay in existence in the north, including Kamchatka. As a result of the operation of northern privileges, the wages on the average for an industry under local control increase by 30 to 40%, and at individual enterprises even more.

Both workers and services personnel take advantage of northern privileges. This increases the rate of pay and the overhead costs as well. In connection with this, consideration must be given to the complex labor structure, wherein of every three workers, one does not engage in the direct production of material goods.

Besides this, capital expenditures on repair and maintenance of buildings due to severe climatic conditions must be taken into consideration, as well as the fact that the buildings are old and require replacement.

This great difference in the cost structure exists, in spite of the fact that the norms of consumption of raw material and labor time for analogical mechanized production in Kamchatka are comparable to those which exist in other oblasts of the nation.

Under the existing arrangement, the Oblispolkom (Oblast' Executive Committee) can support local prices on goods of local manufacture which have been made out of local materials. The price of furniture and footwear is supported by this Executive Committee in Kamchatka. This makes their production somewhat more profitable (Table 84).

On the whole the profitability of local industry in the Kamchatskaya Oblast" is still very low, and a number of enterprises operate at a loss. Thus, at the Elizovski Regional Industrial kombinat, from 1952 to 1955, gross output was 9.7 million rubles while its losses for that period came to 1.7 million rubles.

The state of local industry in Kamchatka is considerably improved by its being excused paying state taxes on turnover until 1960, this makes it possible to invest the remaining financial resources in capital investments in local industry. Under the present 5-year plan these capital investments have amounted to 10.0 million rubles. It is planned to increase this to 147.1 million rubles during the 7-year period 1959 to 1965.

The main reasons for poor development of local industry are the following.

An insufficient local raw materials base, in the first place agricultural, and the lack of attention by local economic organizations to the utilization of available types of raw materials in the Oblast'.

TABLE 84

THE PROFITABILITY OF INDIVIDUAL, LOCAL INDUSTRY PRODUCTS

IN KAMCHATKA, SUMMARY DATA FOR 1956

(IN RUBLES AND KOPOEKS)

PRODUCT	UNIT OF MEASURE	COST	SELLING PRICE	RESULTS -- PROFIT - LOSS
<u>FOODSTUFFS</u>				
Bread; sold by weight - 97%	Kg.	1-42	1-30	- 0-12
Long loaves	"	3-78	3-32	- 0-46
Cakes "Banana"	"	6-30	8-41	+ 2-11
Vermicelli	"	3-68	2-90	- 0-78
Wrapped Carmel	"	15-98	16-18	+ 0-20
Keg beer	l	0-91	3-98	+ 3-07
Carbonated water with synthetic flavoring	"	1-74	1-53	- 0-21
Pepper - Brandy (30°)	"	3-41	30-36	+ 26-95
Anisette (40°)	"	4-13	38-27	+ 34-14
<u>MANUFACTURED GOODS</u>				
Men's winter coat	Item	295-05	249-50	- 45-55
Pants, short	"	13-74	10-00	- 3-74
Sheets	"	33-60	41-00	+ 7-40
Curome-leather boots	Pair	364-62	366-00	+ 1-38
Soft slippers	"	58-92	65-87	+ 6-95
Divans	Item	342-24	1045-00	- 297-24
Chairs	"	71-34	74-25	+ 2-91
Tables	"	183-00	200-35	+ 17-35

Unsatisfactory transportation conditions, particularly internally, which hamper the exchange of materials and finished products between raions in the Oblast'.

The low quality and high cost of local products, as a result of which trading organizations direct their attention to import of all products from the central regions of the nation.

The necessity for developing local industry in Kamchatka is obvious. However, the question concerning its scale and structure presents well-known difficulties, if one takes into consideration that imported goods, as a rule, are better in quality and are cheaper than the same goods made locally.

Criteria for solution of the given problem must be: Nature and extent of local raw materials resources, transportability of goods and the capacity of national economy for local production compared with importing the same goods from abroad.

Kamchatka has only limited raw materials resources for local production of consumer goods. These are leather goods (for footwear), timber (for furniture), furs and pelts (that portion which remains at the disposal of the Oblispolkom).

Leather goods are represented mainly by the hides of reindeer and a small amount of pigskin, cattle hides and those of horses.

A plenitude of reindeer herds in the Oblast' and a comparatively concentrated slaughter of reindeer permits a considerable development in the leather-footwear production.

Reindeer hide can be made into box-calf and chamois (for wiping and for the manufacture of footwear in Kamchatka. In the neighboring Magadanskaya Oblast' only ladies slippers and boots are made of it and high quality materials were used for the lower part of the boot, which as a rule, had been imported from the "mainland". This footwear is in great demand amongst the population of the Oblast' and is profitable in manufacture, since it is considered a fashionable footwear. It would be a good idea to take advantage of this experience in Kamchatka.

It would be possible to fully meet the requirements of Kamchatka's population in light footwear and box-calf boots and chamois slippers by a leather-footwear industry based on local raw materials. The production of light footwear would be possible. When the mechanized leather-making plant goes into operation in 1960 there will be a reduction in the cost of raw material. The considerable extension in output of reindeer chamois will make it possible to set up regular production of light footwear. The setting-up of a mechanized shop (mechanization of light footwear production is very simple) will increase the productivity of labor, will decrease the amount of hand labor and at the same time will lower the cost of the product.

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However, local leather materials are not suitable for manufacture into many types of footwear. Therefore, as before, footwear will be brought in from abroad. This situation is hardly satisfactory. It is known that the footwear industry is one of those branches which it is more expedient to locate near the market. This is accounted for mainly by the considerably better transportability of leather goods than of footwear. In the transportation of leather goods the freight carrying capacity of railway freight cars is utilized approximately 70 to 75%, and in the transport of footwear only 31%.

The population's need for footwear is very great. Every person (of any age) uses at least 2 pairs per year. This means that the Kamchatka population needs approximately 350 to 400,000 pairs of shoes at the present time and in the future will require 600 to 650,000 pairs per year. Fashionable footwear will be brought in from the large factories, while it will be expedient to manufacture everyday work footwear locally from imported material. At the present time footwear is imported from Leningrad and Moscow, while leather goods can be obtained from Irkutsk and other Siberian leather factories.

A most valuable raw material which is very little used at the present time is fur. The pelts of reindeer, wolf, bear, and rabbit remain at the disposal of the Oblispolkom. The furrier trade should be developed on this raw materials base.

It is worthy of note that the indigenous population of the Oblast' from time immemorial has taken pride in its ability to make garments from reindeer hide. However, production of these items is not organized, and the original craft has died out. Such a situation is clearly unnatural. The indigenous population of the North must be helped to re-establish its half-forgotten crafts. It appears that this must be undertaken not by local industry, but by the fishing cooperatives, which have a developed network of their own organizations at all the populated points. The fish-cooperatives must help the kolkhozniks organize shops for manufacture of fur items, supply them with the necessary tools, and buy their produce for resale in other areas. The setting-up of primitive shops within the industrial system under local control is not reasonable due to the large overhead costs. However, at least part of the fur materials may be processed in this way. It is therefore worthwhile to set up furrier shops in the Oblast'.

The furniture industry has more promise for development. The rich forest resources of the Kamchatskaya valley are a fairly good raw materials base for production of furniture. True, for manufacture of high quality furniture it is necessary to import some amount of Far East timber. But the bulk of the most widely used furniture can be made out of local materials.

The expediency of manufacturing furniture locally is obvious, since in transporting it the freight carrying capacity of freight cars is used only in the amount of 20 to 21%. Furniture manufacture is evolving in Kamchatka even now. In 1958, a furniture factory turning out furniture in the volume of 200 million rubles went into operation. A box factory will be organized in conjunction with this factory, it will produce tare for confectionery and macaroni products, this is very much needed by the food enterprises. This factory is situated in Petropavlovsk. It is expected that by 1965 it will be producing up to 5 million rubles worth of furniture per year. It would be sensible to have an assembly shop

at Petropavlovsk, while the individual items would be processed nearer to the areas where timber is cut, most likely at the town of Klyuchi, at the woodworking kombinat located there. This kombinat could supply furniture parts to all points in the Oblast', at which it would be necessary only to assemble and glue them and perhaps paint them. Transfer of ready-made parts would not be more expensive than timber, since timber is transferred mainly on the decks, and not in the holds (of ships).

It is absolutely necessary to develop the sewing industry in Kamchatka. Sewing shops and dress shops for custom tailoring must be located in all the large settlements in the Oblast', it follows that mass production of garments must be organized. The population requirements in bedding and underwear, in padded trousers, jackets and combinations can be fully met by local sewing.

Because of the long haul, the trading organizations in the Oblast' receive the garment shipments from abroad irregularly and there frequently is a shortage of outer garments for men, women and particularly children, and of linen and dresses, in the trading network. Cotton goods arrive more regularly. It must be noted that the production of a wide range of articles at a sewing factory, as the experience at Magadansk factory has shown, is not justified economically.

It is far more expedient for Kamchatka to arrange closer ties with its nearest neighbors, in particular with the Magadansk Oblast', and to obtain outer garments from there, where production of these items has already been set up. This will have a favorable effect on the operation of the Magadansk factory, since an increase in the number of articles produced will permit an improvement in the organization of production and to lower the cost.

It has been planned that a sewing factory with a production line of 100 sewing machines would be built at Petropavlovsk by 1960 however, construction of it has not yet begun.

There must be a sharp increase in the production of foodstuffs in the Oblast'. There are real possibilities for increasing the production of dairy products. In the year 1965, 7 thousand tons of milk will be delivered for processing to Petropavlovsk by the adjacent kolkhozes and sovkhoses. This will provide work for a dairy plant of 20 tons per day capacity. The plant's output (cheeses, ice cream, etc.) will supply the city's population, and after the construction of highways, other populated localities.

Sausage products will be made out of local and imported materials. A delicious, high quality sausage can be made in the northern region of the Oblast' from reindeer meat with an addition of pork and pork fat. There is a plenitude of valuable raw material for sausage making in these regions during reindeer killing time; this material is gut. The meat packers must utilize other by-products of the abattoirs (gut, horn, hoof, etc.).

There is a shortage of beer and grape and berry wines in the city and particularly in the Oblast's raions. A plenitude of these beverages in the stores will reduce the requirements for hard liquor and spirits. For this reason it is expedient to build a brewery in Petropavlovsk with a capacity of 35 thousand hectolitres per years as well as brew shops in the more densely populated areas which would have a capacity of 5 thousand hectolitres per year each.

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There is a large variety of useful berries and mushrooms in the Oblast'. It is possible to organize production of tasty food products on this base taking advantage of the great popular demand amongst the population. The berries can be made into jams, jellies, etc., and berry wine; the mushrooms can be dried, salted and pickled.

The above-named products are not produced in Kamchatka. There is a project to build a berry-wine plant at Petropavlovsk which by 1965 would have an output of 26 thousand decalitres of wine per year. The plant would utilize not only wild berries; it is planned to organize a subsidiary economy, on the outskirts of the town, which would raise 30 hectares of raspberries, black and red currants.

One of the most vital problems in developing industry which is under local control is the distribution of enterprises throughout the territory of the Oblast'. The problem is that there is as yet no requirement and will not be a requirement for some time to come, for building relatively large enterprises in a number of communities. The propagation of small primitive shops in many settlements which are subordinated to the Obilspolkom would mean a reduction in the efficiency of all branches of production, since these establishments would operate at a loss. One of the main reasons for operation at a loss is the growth of the administrative-management apparatus, i.e. the increase in overhead costs.

In connection with this it appears to be expedient to build a complex of enterprises for production of consumer goods within the system of local control, at such large settlements as Ozernaya, Oktyab'rskiy, Kork, Ust'-Kamchatsk, Mil'kovo, Klyuchi and others. The setting-up of similar industries at other points can be expediently handed over to the Oblrybolovpotrebsoyuz. (Oblast' Fishing Requirement Soviet). The first steps in this direction have already been taken. It is planned to set up mechanized bakeries and food kombinats at the settlements of Oktyab'rskiy, Ust'-Kamchatsk, Klyuchi, Ozernaya and Korf by the year 1965, these would be extensions of the Raipromkombinat. Since 1958, the fishing authority has significantly extended the provision of consumer goods, in volume it has practically overtaken the local industry.

In summary it must be stated that in the foreseeable future the production of consumer goods will increase significantly in the system of local industry in the Kamchatskaya Oblast', however, the requirements of the population will not be fully met by local production. The import of a considerable quantity of the consumer goods should be maintained.

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## CHAPTER 8

### TRANSPORT

#### 1. PRESENT CONDITION

The Kamchatskaya Oblast' is connected with the outside world only by sea and air routes, and in the transport-economic sense it is characterized by an "island" position.

The complete absence of railroads in Kamchatka and the far from adequate length of highways determine the exceptionally important role of sea transport. All external communications and an overwhelming amount of internal transportation connections were affected by sea transport in the past and this continues to be the main method of transportation.

Prior to the establishment of Soviet control in Kamchatka there were no land roads whatsoever, while sea trips were made only occasionally. Kamchatka was visited by boats which brought in freight for the fishing industry and the local population and took away fish products and furs.

A new period in the development of Kamchatka's natural resources and of transport began following the expulsion of the interventionists and the establishment of Soviet control. As early as 1925, steamer trips were organized from Vladivostok to Petropavlovsk and other points in Kamchatka. By 1932 the number of boats serving Kamchatka had increased to 66 from 15 in 1925, while the volume of freight exported and imported grew from 27 thousand tons in 1925 to 176.5 thousand tons in 1932.

Further development of sea transport is closely associated with the continued development of the natural resources in Kamchatka, mainly fishing, as well as meeting the needs of the growing population.

The Kamchatsko-Chukotskoye Steamer Line was organized in 1949 for the purpose of better service to the Oblast'. Year round communications, centered on Petropavlovsk, were provided by ocean-going passenger and trade-passenger boats.

Although in the pre-revolutionary period the total volume of freight delivered to Kamchatka did not exceed 10 thousand tons, by 1956 it has grown to 1,247 thousand tons, i.e., it had grown by nearly 125 times.

The dynamics and structure of Kamchatka's external trade are shown in Table 85. At the present time most of the freight is brought into Kamchatka from other raions in the Far East through the sea ports of Vladivostok, Nakhodka and others. Thus, hard coal is brought into Kamchatka from Suchan and Sakhalin, timber from the Primor'ya and Pri Amur'ya, cement from Spassk and partially from the Chinese People's Republic, grain is brought in from Khabarovskiy Kray, oil and petroleum products from the European part of the USSR and partly from Sakhalin, metals, hardware, tools, industrial products and some footstuffs are brought in from the European part of the USSR, salt comes from Kazakhstan and also from the Chinese People's Republic.

Kamchatka exports only fish products and a small amount of other freight (scrap metal, furs, etc.).

Kamchatka's economy requires that its imports be considerably in excess of its exports. The relationship of imported and exported goods for the Kamchatskaya Oblast' is given in Table 86.

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TABLE 85

DYNAMICS & STRUCTURE OF FREIGHT IMPORTS INTO THE KAMCHATSKAYA

OBLAST' (IN THOUSANDS OF TONS) BY YEARS

TYPE OF FREIGHT	1929	1940	1950	1955	1956
Total	23,1**	317,2	508,3	1249,8	1247,4
INCL: Rafts	-	-	12,0	29,5	21,6
Dry Goods	23,1	303,9	413,0	1074,4	995,4
Coal	13,1	97,4	152,4	352,9	390,2
Lumber on board ship	2,5	37,0	44,9	161,6	140,3
Building materials	-	15,4	4,1	105,9	67,9
Cement	-	5,5	2,1	37,9	48,5
Salt	-	38,8	54,1	94,7	64,9
Metal Ware & Equipment	-	7,8	30,9	51,0	75,5
Foodstuffs & Manufactured goods	1,0	47,5	46,1	135,4	130,9

TABLE 86

RELATIONSHIP OF IMPORTS & EXPORTS FOR KAMCHATSKAYA

YEAR	IMPORT, THOUSANDS OF TONS	EXPORT, THOUSAND OF TONS	RELATIONSHIP IN O/O OF TOTAL FREIGHT TURNOVER	
			IMPORT	EXPORT
1940	317,2	40,9	88,5	11,5
1950	508,3	145,5	77,7	22,3
1954	938,3	163,8	85,1	14,9
1955	1149,8	155,8	88,1	11,9
1956	1247,4	215,3	85,3	14,7



It can be seen from the data given that with the considerable increase in the amount of freight imported into Kamchatka, the volume of exports has been quite stable during the past three years, this has resulted in the lowering of its ratio in the total volume of imports and exports of freight in comparison with 1950. In recent years, 67 tons of various freight have been imported for every ton exported from Kamchatka. Such a relationship of imports and exports has an extremely negative effect on the work indices of the steamer fleet.

Delivery of goods from abroad to the Kamchatskaya Oblast' is carried out mainly by ships of the Ministry of Sea Transport, and only a small volume is delivered by ships of the Fishing Industry. Thus, in 1955, of a total import of 1149.8 thousand tons, the boats of the Ministry of Sea Transport delivered 994.8 thousand tons or 86.5%, while boats of the Fishing Industry delivered only 155 thousand tons or 13.5%.

All transfers of freight between the sea ports and coastal points in Kamchatka is carried out by the Kamchatsko-Chukotskoy Steamship Line and by the steamer transports of the Directorate of Active Sea Fishing of the Kamchatskiy Economic Administrative raion Sovnarkhoz (UMAR).

Dynamics of sea transport and freight deliveries of the Kamchatsko-Chukotskoye Steamship Line and UMAR are given in Table 87 and Figure 23.

During the fifth 5-year period (1951 to 1955), local sea deliveries increased by nearly 84% and freight turnover by nearly 57%, of this, the volume of traffic carried out by the transportation fleet of the Kamchatka Fishing Industry (UMAR) was lowered whereas the volume of traffic carried by the fleet of Kamchatsko-Chukotskoy Steamship Line increased by approximately 3 times. It can be seen from the figures given that following the organization of the Kamchatsko-Chukotskoye Steamship Line in 1949, the bulk of local sea deliveries was made by that line, while the UMAR Fishing Fleet carries only a relatively small amount of seasonal fishing freight.

However, the low level of the work indices for the fleet are accounted for by the unfavorable shipping conditions and freight handling facilities as well as by the poor organization of work in the transportation fleet. Thus, an analysis of the reasons for demurrage shows that in all non-productive layovers of the Kamchatsko-Chukotskoye steamship Line amounting to 4119.6 thousand ton-days in 1955 and 4912.7 thousand ton-days in 1956, the demurrage due to breakdown of shipboard and shore equipment, the absence of workers, lack of coal and water, waiting for docking facilities, tugboats, freight, orders from the Steamship Line and port, signing-on of crews, i.e., demurrage fully dependent on efficient organization of fleet operation, correspondingly amounted to 1,549 and 1,693 thousand ton-days, or approximately 16% of all the ton-days available. The elimination of only this obviously unproductive demurrage of the fleet would free more than 7 thousand tons of shipping for transport work, or 7 steamships of the type "Tissa" during the whole navigational period.

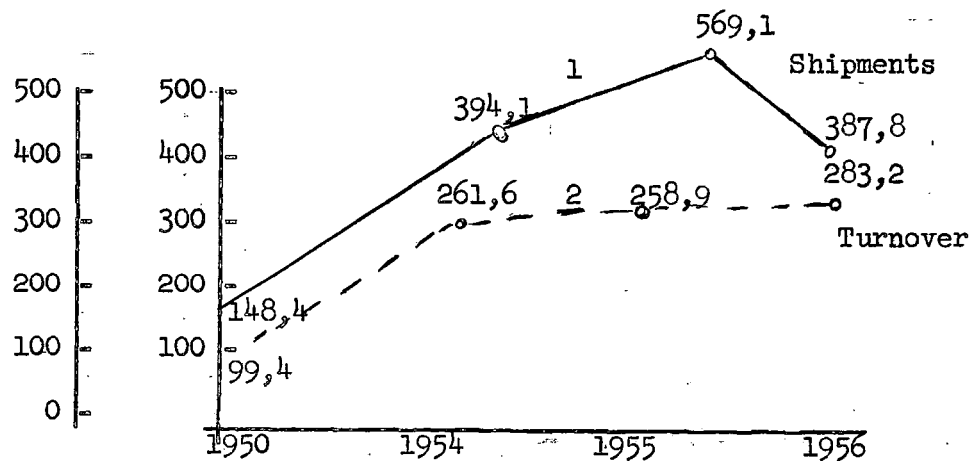
The sea port of Petropavlovsk is situated in Petropavlovsk Bukhta, which is a part of the Avachinskaya Guba of the Pacific Ocean. Petropavlovsk Bukhta is divided by a sand-gravel bar into two sectors: the inner and outer harbors. Anchorages for the sea trade fleet are located in the outer harbor, while the inner harbor serves as a fishing port.

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TABLE 87

DYNAMICS OF SHIPPING & FREIGHT TURN-OVER FOR KCHP & UMAR

YEAR	SHIPMENTS, THOUS. TONS			FREIGHT TURN-OVER MILLIONS OF TON-MILES		
	KCHP	UMAR	SUB-TOTAL	KCHP	UMAR	SUB-TOTAL
1950	148,4	204,6	353,0	99,4	149,2	248,6
1954	394,1	171,0	565,1	261,6	93,6	355,2
1955	469,1	180,2	649,3	258,9	96,8	355,7
1956	387,8	181,8	569,6	283,2	107,9	391,1



Dynamics of Shipments & Turnover for  
the Kamchatsko-Chukotskoye Steamship  
Line (K.C.H.P.)  
1. Shipments  
2. Turnover

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The Avachinskaya Guba is a circular gulf which reaches for 13 miles into the peninsula; its area is 250 sq. kilometers. The Avachinskaya Guba is joined to the ocean by a narrow strait 1.5 miles in width. It is one of the best harbors in the world.

On the 1st of January 1958, Petropavlovsk Port had two areas, one for general freight and one for coal. Petroleum products were off-loaded at the oil base anchorage, while passengers embarked and debarked at the anchorages in the general freight area. There are a number of anchorages in the Port. Mechanized loading and off-loading in the port is carried out by gantry, caterpillar-tracted and floating cranes, portable cranes, automatic loaders, etc. Covered and open freight sheds have been built in the port for storage purposes.

Planned development of natural resources and the development of the fishing industry in Kamchatka during the years of Soviet rule have resulted in a considerable increase in the freight turnover at Petropavlovsk port. Although in 1929 the freight turnover at the port amounted to only 21.9 thousand tons, in 1940 it amounted to 282.7 thousand tons, that is, it had increased by nearly 13 times, while in 1957 it amounted to 1399 thousand tons or 64 times greater than in 1929.

The dynamics of freight turnover at the Petropavlovsk Seaport are shown in Figure 24.

In the past 15 years (1940-1955) freight turnover at the port has increased by more than 4 times. The distinct preponderance of import over export is accounted for by the above enumerated reasons, which are the necessity for importing almost all types of freight whereas only fish products and a small quantity of other freight was exported.

The principal freight delivered to the Petropavlovsk trading port is hard coal, timber and liquid petroleum products, these make up approximately 67% of all deliveries. Delivery of bread products and other freight is less than 16%, all remaining freight totals less than 17% of gross delivery.

The volume of shipments from the Petropavlovsk port and their structure is determined mainly by the nature of organization of the transfer of freight imported into Kamchatka. When the bulk of the imported freight is delivered directly to the importer without transshipment at Petropavlovsk the volume of shipments from the port is relatively small. If, however, on the other hand, a considerable amount of the imported freight directed to Western Kamchatka and elsewhere is transhipped at Petropavlovsk, the volume of shipments increases, and its structure is determined by the nature of these transshipment.

Thus, in 1956, most of the freight dispatched from Petropavlovsk consisted of metalware, hardware, tools, hard coal and a group of other freights (all together these exceeded 72%); the dispatch of fish and fish products amounted to less than 6%, while dispatch of all remaining freight amounted to about 22%.

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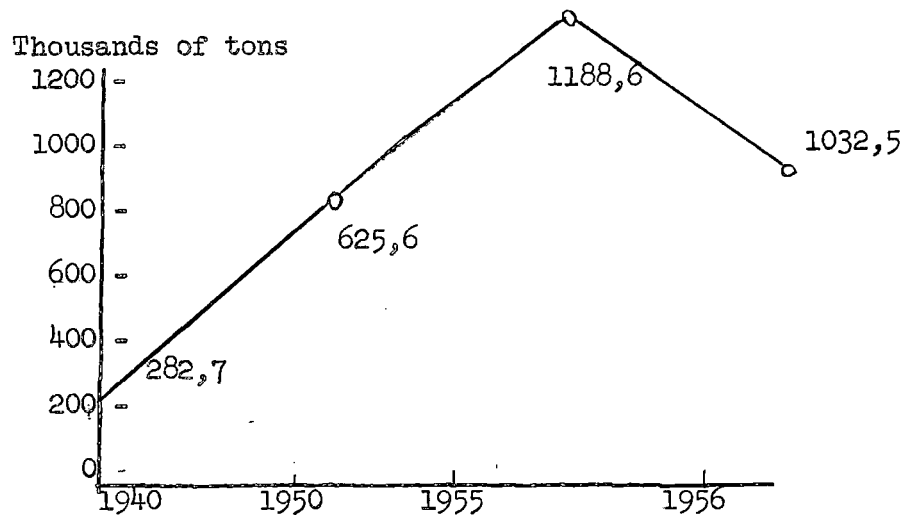


Figure 24: Dynamics of freight turnover at Petropavlovsk Seaport

The value of transfer at the Petropavlovsk port in 1957, taking local hauling into consideration, amounted to 1141 thousand tons and 1276 thousand ton-operations. The transfer of all freight was carried out mechanically, but the volume of transfer by complex mechanism amounted to only 650 thousand ton-operations, or 45%. In connection with this the output of stevedores amounted to 18.2 ton-operations per man shift, while the cost of transfer of one physical ton of freight was 19 rubles 91 kopeeks.

The Petropavlovsk sea trade port controls the local and service-ancillary fleets. On the 1st of July 1958, the local fleet consisted of three tugs of total power of 1350 hp, two dry-goods barges with a freight carrying capacity of 500 tons each, 15 barges of 100 tons each and 3 passenger cutters. The services-ancillary fleet consisted of one tug of 300 hp, 6 towing cutters of 150 hp each, 4 tanker-barges with a load carrying capacity of 500 tons each and 2 pontoons with a load carrying capacity of 100 tons each.

In 1957 the local fleet carried 210 thousand tons of freight and 162.4 thousand passengers and it made 1464 thousand ton-miles and 989 thousand passenger-miles. Local transfers are mainly carried out within the confines of the Avachinskaya Guba.

In order to ensure the transfer of the growing volume of local freight and passengers and to lower the cost of handling and transfer of freight, it is necessary to first of all complete construction work on the Port of Petropavlovsk.

The second most important freight handling port is that of Ust'-Kamchatsk, it is situated at the estuary of the Kamchatka river. The anchorages are located on the river side of the bar, but due to the shallowness of the bar only small boats are able to enter the estuary of the river for delivery of freight at the anchorages. Most of the ocean-going boats are forced to remain at the sea roadstead and to be serviced by means of the roadstead facilities. For practical purposes navigation begins in the second half of May and ceases at the end of December.

The Ust'-Kamchatsk port is equipped with caterpillar-track, vehicular mounted and floating cranes for loading and off-loading operations.

In 1957, freight turnover at the port amounted to 237 thousand tons, while freight handled amounted to 336 thousand ton-operations, including 322 thousand ton-operations performed with the help of mechanized equipment, this represents 96% of all handling. The bulk of the freight handled at the port (about 70%) is composed of forest products, which are delivered to the port from the Kamchatka river basin and are off-loaded by ocean-going ships at Petropavlovsk and other points in Eastern and Western Kamchatka; the second most important freight is foodstuffs, industrial goods etc. (20%) and in third place is coal (10%). Due to the roadstead conditions for transferring freight the cost of freight handling is very high: in 1956 it amounted to 117 rubles 29 kopeeks, and in 1957 it was 76 rubles 90 kopeeks per physical ton. The most important task for the port is to lower cost of freight handling operations, however, the solution of this problem is associated to a considerable degree with reconstruction of the port, removal of roadstead servicing of ocean-going ships and complete mechanization of loading and off-loading operations.

There are portlets for off-loading seasonal fishing and other freight intended for the fishing kombinats as well as for taking-on fish products processed at these plants. The largest of these portlets are Ozeraya, Bol'sheretskiy, Oktyabr'skiy, Kikhchik, Pymta, Kirovsk, Krutogorovo, Anapka, Korf and Olyutorka. All these ports are roadsteads and operations are very dependent on hydro-meteorological conditions, particularly icing and storms. The period of greatest storms occurs in the fall (October, November), when most of the fish products are ready for shipment. However, the export of finished product during this period is rendered extremely difficult, since, because of the roadstead conditions for loading, the transport ships frequently weather the storms on the high seas, not being able to carry out loading operations. The roadstead conditions of loading and unloading operations result in non-delivery of goods to many rybokombinats and inability to dispatch finished fish products, this results in enormous non-productive losses (non-productive demurrage of transport ships, loss of roadstead facilities, loss and spoilage of freight, reduction in the variety of prepared fish products, etc.).

The freight turnover and basic work indices for the portlets during the year 1957 are given in Table 90.

The main freight turnover at the portlets is the arrival of seasonal fishing freight and consumer goods and the export of fish and fish products.

TABLE 90

FREIGHT TURNOVER & MAIN WORK INDICES FOR PORTLETS IN 1957

PORTLET	TOTAL, THOUS TONS			TONS-OPS COMPLETED THOUSANDS	INCL:		
	DES- PATCH	REC- EIPT	SUB- TOTAL		SHIP- BOARD EQUIP	SHORE EQUIP	MAN- UAL
Ozernaya	15,2	27,0	42,2	84,4	42,2	18,2	24,0
Bol'Sheretsk	7,0	23,3	30,3	60,5	30,3	12,0	18,2
Oktyabrskiy	14,1	33,1	47,2	94,2	47,1	21,0	26,1
Kikhchik	10,9	21,5	32,4	65,0	32,5	10,5	22,0
Pymta	9,5	15,0	24,5	48,8	24,4	6,0	18,4
Kirovsk	15,8	34,8	50,6	101,2	50,6	18,6	32,0
Krutogorovo	11,5	22,6	34,1	68,2	34,1	8,0	26,1
Anapka	24,2	33,5	57,7	115,0	57,5	18,5	39,0
Korf	12,8	21,2	34,0	68,1	34,0	10,0	24,0
Olyutorka	3,3	10,1	13,4	26,8	13,4	2,0	11,4

It can be seen from the Table that freight turnover at the main roadstead portlets is relatively small, but in connection with the roadstead conditions of loading and off-loading operations the coefficients of handling reached a considerable size, up to 2 and more.

The bulk of the freight is still manhandled. Thus, the ratio of freight manhandled in 1957 came to 38% at Krutogorovo, 35% at Korf, about 30% at Bol'sheretsk and 31% at Kirovsk.

The roadstead conditions of operations and the lack of technical equipment at the portlets results in extremely high cost of loading and off-loading operations, these came to 154 rubles per ton at Anapka and 311 rubles per ton at Kikhchik in 1957.

In addition, the unsatisfactory utilization of the fleet and increased costs in utilization of boats associated with the natural-economic conditions of operation in the waters surrounding Kamchatka (the relatively short navigation period, the difficult sailing conditions and roadstead conditions for servicing boats, increased labor costs, high cost of materials, fuel, etc.), determined the exceptionally high cost of shipment.

The following is a breakdown of shipping costs during recent years in kopeeks per ton mile:

	1954	1955	1956	1957
Kamchatsko-Chukotskoye	26.9	26.7	27.9	37.6
Steamer line				

UMAR	71.0	74.9	66.0	62.4
------	------	------	------	------

The cost to the Kamchatsko-Chukotskoye Steamship Line for ocean shipment in recent years varies between 27 and 30 kopeeks, while that for the UMAR varies between 62 and 75 kopeeks per ton mile, this is higher by 2.0 to 2.5 times.

Unfortunately, information is not available for an analysis of the reasons for such a considerable difference in the cost of shipment between the two steamship lines. The principal reasons are the lower efficiency of UMAR fleet (by 30%), the higher cost of maintenance for these boats (increased wages, higher repair costs) and the participation in UMAR shipping by a considerable number of small tonnage schooners.

In general, the cost of shipment in Kamchatka waters during 1956 was greater than the average for ocean shipments for the USSR by 6 times for the Kamchatsko-Chukotskoye steamer line and by 13 times for the UMAR fleet; in comparison with Far East Steam freight transportation by the Ministry of Sea Transport of the USSR, costs were greater by 2.5 and 6 times respectively.

River Transport. River transport has been developed to some extent only along the Kamchatka river; this is the largest river in the Kamchatskaya Oblast'. A short characterization of navigation on the Kamchatka river is given in Table 91.

It can be seen from the Table that the Kamchatka river is navigable to shallow-draft boats (cutters, barges) only along its central and lower sectors, from the village of Mil'kovo to the estuary for a distance of 593 kilometers, this includes the stretch from Mil'kovo to the mouth of the Urtsa river, a distance of 130 kilometers, which presents serious difficulties to navigation. The upper sector of the river is of the nature of a swift-flowing mountain stream and is unsuitable to navigation by cutters and barges in its natural state.

Navigation is irregular on the central sector of the river, the main shipments are made during the spring period and during periods of summer floods. The lower sector is navigable during the whole season.

The Kamchatka river has been used for navigation since 1934-1935. However, to this very day there is not a single river steamer organization for carrying all river shipments. This is accounted for by the lack of necessary information for an analysis of river shipments and operations of the river fleet in the Kamchatskaya Basin.

Total volume of shipments and freight turnover during 1955-1956 is given in Table 92.

The basic freight shipped along the Kamchatka river is timber in rafts and on boats, it amounted to 94% of all river shipments in 1965. The considerable increase in volume of shipment in 1956 as compared with 1955 is accounted for by the increase in shipments of timber in rafts, in connection with the shipment during the 1956 navigational period of not only the 1956 timber, but a large part of the timber cut in 1955 and not shipped out in that year.

There are boats in the river fleet which by their displacement and design cannot be effectively utilized for operation along the Kamchatka river.

TABLE 91  
ASHORT CHARACTERIZATION OF NAVIGATION  
ON THE KAMCHATKA RIVER

NAME & BOUNDARIES OF SECTORS	LENGTH IN KILO- METERS	AVERAGE LENGTH OF NAV- IGATION PERIOD IN DAYS	MINIMUM LIMITS FOR NAVIGATION IN METERS		
			WIDTH	DEPTH	RADIUS OF CURVATURE
UPPER (From source to Milk'ovo, 593 km from mouth	178	188	10	0,2	No. Inf
MIDDLE (From Milk'ovo to the middle current of K. River 350 km from Estuary	243	186	40	0,7	200
LOWER (Middle Current To Estuary)	350	170	75	1,1	80

TABLE 92  
VOLUME OF SHIPMENTS & TURNOVER ON THE  
KAMCHATKA RIVER FOR 1955-56 (THOUS. TONS)

FREIGHT	1955	1956
<u>UST'-KAMCHATKA SEAPORT*</u>		
Timber rafts	61,3	171,9
Timber on Boats	13,5	18,9
Other	17,8	26,5
Sub-Total, Shipments	92,6	217,3
Turnover, millions ton/km	11,5	42,7
Trust "Kamchatles"		
Timber Rafts	359,0	494,6
Timber on Boats	16,0	16,7
Other	9,0	10,5
Sub-Total, Shipments	384,0	521,8
Turnover, millions ton/km	No. Info.	No Info
Oblrybolovpotrebsoyuz		
Other	10,9	11,7
Turnover, millions ton/km	No. Info	1,5

\* This seaport tranships timber mainly below Klyuchi; the trust "Kamchatles" Ships to here.



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The transfer of freight and passengers along the Kamchatka river is carried out by the fleet as shown in Table 93, this is as of 1 January 1957.

In view of the unfavorable shipping conditions, the irregular movement and lack of coordination in the operation, the work indices for the fleet are low while costs are high. Thus, the cost of river shipments in 1956, according to the Ust'-Kamchatskiy Seaport, were 25 kopeeks per ton kilometer, while according to the Oblrybolovpotrebsoyuz, operating mainly on the central sector of the Kamchatka river, it was 138 kopeeks per ton kilometer.

Motor Vehicle Transport. This type of transportation is of great importance for internal and external transfer of freight and passengers. However, it is very poorly developed in Kamchatka, its operations are extremely limited due to the lack of goods roads.

As of 1 January 1958 the total length of gravel roads in Kamchatka amounted to only 96.0 Kilometers, improved dirt roads amounted to 127.5 kilometers and graded dirt roads totalled 146.0 kilometers. This gives a total of 369 kilometers of road which amounts to approximately 0.65 kilometers per thousand square kilometers, as against 9.6 kilometers on the average for the USSR or, in other words, 1/15th as much.

In spite of the short extent of roads in the Kamchatskaya Oblast', motor transport carried out a relatively significant transfer of freight.

TABLE 93

UNITS OF THE KAMCHATKA RIVER BASIN FLEET

TYPE OF FLEET	NUMBER OF BOATS	POWER H.P.	LOAD-CARRYING CAPACITY, TONS
<u>UST'-KAMCHATKA SEAPORT</u>			
Self-Propelled	37	7230	1980
Not Self-Propelled	31	--	9850
Trust "Kamchatles"			
Self-Propelled	45	6050	--
Not Self-Propelled	36	--	3100
<u>OBLRYBOLOVPOTREBSOYUZ</u>			
Self-Propelled	14	1148	--
Not Self-Propelled	18	--	826

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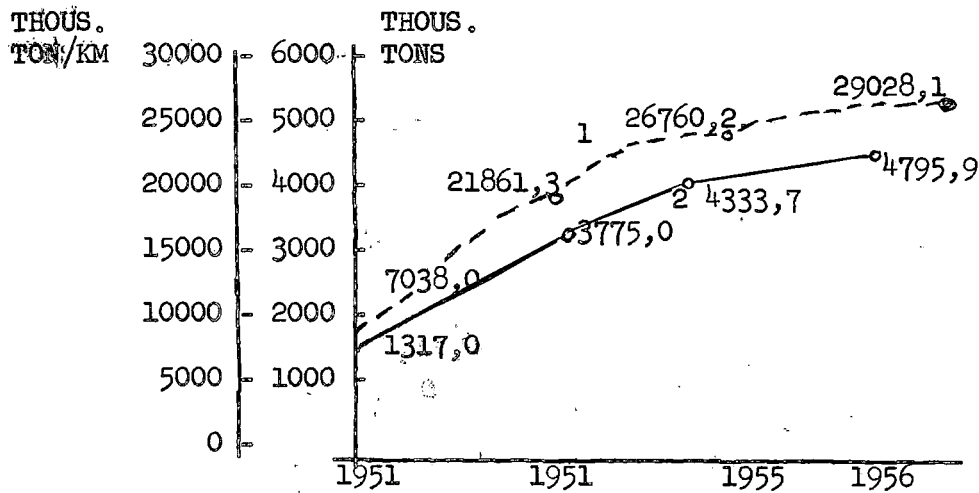


FIG. 25 DYNAMICS OF VEHICULAR SHIPMENTS

1. In Thous of Ton/km;

2. In Thous of Tons.

The dynamics of motor vehicle freight hauling in the Kamchatskaya Oblast' are shown diagrammatically in Figure 25, from which it can be seen that the volume of truck-hauled freight and freight turnover increases year by year. In 1956, truck-hauled freight and freight turnover had increased, in comparison with 1951, by respectively 3.6 and 4.1 times.

Air Transport. Airlines occupy a very important position in transport and communications in Kamchatka. During the years of Soviet rule, Kamchatka has acquired regular air communications with Khabarovsk, Moscow, Magadan and many other important industrial and cultural centers of the land; because of this the Oblast' has come "nearer" to the central regions of the Soviet Union and more accessible in a transportation sense. The center of the Kamchatskaya Oblast', Petropavlovsk, is directly connected by airline with Magadan, Khabarovsk and the main industrial and regional centers of the Oblast'.

The volume of air transfers in 1957 exceeded by approximately 1.9 times the volume of air transfers in 1955. The cost of air freight is extremely high: in 1957 it amounted to 6 rubles 39 kopeeks per ton-kilometer, as against 15 to 16 kopeeks for sea freight and 1 ruble 79 kopeeks for motor freight on the average throughout the Kamchatskaya Oblast'.

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Due to the complete absence of roads, poorly developed and seasonal operation of sea transport, air transport is the only means available to many of the raions in the Oblast' for transporting urgently needed supplies rapidly, particularly between navigation periods.

Increased transportation costs for delivery of some goods by air are economically justified where these ensure uninterrupted operation of enterprises. The cost of air passenger transportation in the Kamchatskaya Oblast' raions is considerably lower, from the national economy point of view, than other means of transport.

Thus, the expenses for one business trip from Petropavlovsk to the West coast of Kamchatka, depending on the method of transport used, are as follows:

	Air	Water	Plus Minus Difference
Time of travel on the average	1	72	71
Fare in rubles	200	150	-50
Salary en route, in rubles (considered to be 1500 rubles per month)	6	150	144
Per diem travelling expenses in rubles (at a rate of 35 rubles per diem)	5	105	100
Sub-Totals in rubles.....	211	405	194

These figures show that the total cost of maintaining passengers en route (salary, business expenses, fare) for air transportation is considerably lower than for travel by water transport.

Air Transport plays an enormous role in cultural services to the population of the Kamchatskaya Oblast' raions. Newspapers, journals, books, movie films etc., are delivered by air transport at the present time. All this testifies to the fact that air transport occupies an important position in the transportation system of the Kamchatskaya Oblast'.

However, there is still an insufficient number of equipped airdromes and landing strips for regular air communications between Petropavlovsk and the main industrial regions of the Oblast' in order that these may be able to accomodate modern transport aircraft (of the type LI-2, IL-12 and IL-14).

Sled Transport. Sled transport continues to occupy an important position in a number of the northern national raions, where reindeer and dogs continue to be the sole means of travel, carrying freight and carrying mail.

In order to improve the delivery of freight supplies to the northern national raions of Kamchatka and for the purpose of reducing the number of sled dogs, which require a large amount of valuable fish for feed, it is necessary to universally introduce shallow-draft boats for the purpose of travel along shallow rivers. This must first of all be done in the Penzhinskiy and Olyutorskiy raions. It is also necessary to introduce vehicular and tractor transport wherever travel conditions will permit.

A brief review of the present condition of transport in Kamchatka will permit one to draw the following basic conclusion:

1. At the present time transport in Kamchatka consists of five types: Sea transport, river transport, truck transport, air and sled transport.

2. Sea transport is the main means of moving all the internal and most of the external freight in Kamchatka. In spite of its considerable growth during the years of Soviet rule, is still poorly developed at the present time and is a bottleneck in the Kamchatka economy. The existing disproportion between a sufficiently large transport fleet, the relatively unsatisfactory condition and extremely poor development of a network of ports and the poor technical equipment at these produce low indices of utilization of seagoing ships and high cost of transfer and handling of freight. Steamship lines are characterized by a clearly expressed unilateral flow of freight, imports amount to 85 to 88% and exports only 12 to 15% of the total freight turnover in Kamchatka.

3. Truck transport in Kamchatka is very poorly developed due to the nearly complete absence of motor roads as well as the lack of technically equipped repair bases and garages. The unsatisfactory condition of the motor road network and the motor transport industry results in poor utilization of the motor vehicle fleet and high cost of motor transfer of freight.

4. River transport has been somewhat developed along the Kamchatka river. Unfavorable navigation conditions and the irregular movement of the river fleet, because of the absence of coordination in operation between the Kamchatsko-Chukotskiy sea transport ("Kamchatles") and the Rybolovpotrebsoyuz, which make deliveries along the Kamchatka river, are the main reasons for the extremely high cost of river transport.

5. Air transport has been considerably developed during the years of Soviet rule. Petropavlovsk, the center of the Oblast', is connected by regular airline with Khabarovsk and Moscow. However, due to the insufficient number of airdromes and landing strips, airlines have not been organized between individual raions of the Oblast'. At the present time the regional centers are connected only with Petropavlovsk, while air communications between them are absent.

6. The present transportation conditions in Kamchatka do not meet the growing transportation needs of the national economy and are delaying its development.

## CHAPTER IX

### WAYS OF RAISING THE ECONOMIC LEVEL OF THE PEOPLES

#### OF THE KAMCHATSKAYA OBLAST

#### 2. Present conditions of the folk economy in Kamchatka. Types of industry and their distribution in the Okrug

Five types of industry have sprung up in the national raions of Kamchatka as a result of socialist reconstruction:

1. Reindeer breeding sovkhoses, where the main occupation is reindeer raising. These industries are operated mainly by the tundra Koryaks; particularly the Chukchi (formerly nomadic reindeer herders);

Footnote: Besides reindeer breeding sovkhoses, there is also a fur-raising sovkhos on the Komandorskiye Ostrova, which engages in breeding of blue foxes and in hunting seal. Subsidiary branches are fishing, cattle raising and vegetable growing. (End of Footnote.).

2. Fishing artels, where the main occupation is fishing; the population consists mainly of coastal Koryaks and Itel'mens;

3. Fishing and reindeer-breeding artels, where the main occupation is fishing with reindeer breeding as a subsidiary occupation. Artels which grew up on the basis of mixed reindeer breeding-hunting co-ops are associated with this industry. The population is mainly Koryak;

4. Reindeer breeding artels, where the main occupation is reindeer breeding, subsidiary occupations are planting, raising domestic livestock and fishing; the population is Koryak (former nomads and settled tribes) and Evens.

5. Agricultural artels, where the main occupation is tilling and fishing; the population is Itel'men.

The kolkhoz industries, represented by the various types of artels enumerated above, are distinguished by a more varied structure of production than are the sovkhoses. They normally contain several branches of the economy, the ratio and importance of which varies for different artels depending on their specialization (Table 113).

It must be emphasized that such new branches of industry as tilling, cattle raising etc., remain in a much lower income bracket than the older branches such as reindeer breeding and fishing, as can be seen from the comparison of incomes-per-workday for each of these branches (Table 114).

The income per workday from reindeer breeding is nearly  $1\frac{1}{2}$  times greater than that from fishing and is twice as great as the income from domestic livestock raising and tilling.

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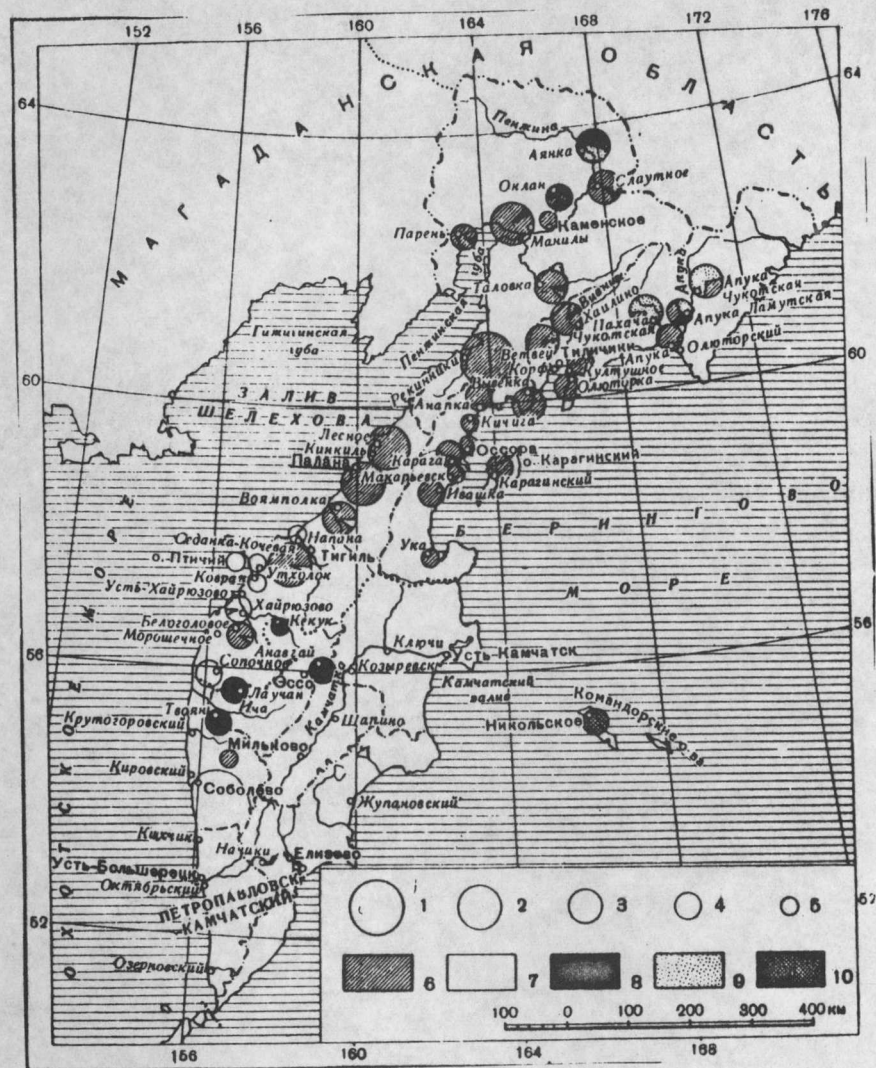


FIGURE 29

SCHEMATIC MAP OF KAMCHATKA'S

NATIONALITIES AS OF 1 JANUARY, 1956:

1. Over 400 persons;
2. From 300 to 400;
3. From 201-300;
4. From 101-200;
5. Less than 100;
6. Koryaks;
7. Itel'men;
8. Even;
9. Chukchas;
10. Aleuts.

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TABLE 113

RATIO OF BRANCHES OF THE ECONOMY BY KILKHOZES IN THE  
NATIONAL REGIONS OF THE KAMCHATSKAYA OBLAST' (% OF SUB-TOTAL)

BRANCH OF THE KILKHOZ ECONOMY	FISHING ARTELS	FISHING- REINDEER RAISING ARTELS	REINDEER RAISING ARTELS	AGRIC- ULTURAL ARTELS NO. REIN- DEER	FOR ALL KILKHOZES OF THE OKRUG
Fishing	75,6	66,3	4,8	8,8	58,4
Reindeer-Breeding Domesticated Animals	--	4,2	52,0	--	10,7
Planting	4,8	2,0	9,6	18,3	3,2
Other Occupations (Hauling, Sealing etc.)	0,8	0,8	3,0	24,9	2,2
	18,8	26,7	30,6	48,0	25,5
Total	100,0	100,0	100,0	100,0	100,0

TABLE 114

INCOME AND MONETARY PAYMENTS TO KILKHOZNIKS PER  
WORKING-DAY AT AGRICULTURAL ARTELS IN THE RAIONS  
(AVERAGE FOR 1954-1956; IN RUBLES)

BRANCH OF ECONOMY	INCOME PER WORKING- DAY	ACTUAL PAYMENT PER WORKING DAY
Reindeer	29,20	} 19,85
Domestic cattle	9,85	
Planting	10,50	
Fishing	21,62	
Other	24,31	

In conclusion, the following main characteristics of the condition of the folk economy in Kamchatka must be emphasized.

1. Fishing, which in the past was the main occupation of only the settled coastal population, has become, during the years of Soviet rule, the main branch of the economy of the Koryak National Okrug. Rybokombinats, fish packing plants, fishing kolkhozes and motor-fishing stations have been built in the Okrug.

Renovation of technical equipment and the mastering of new methods of fishing has increased the productivity of labor of the fishermen. Together with this, as well as in association with development of new fishing areas, the total take has grown considerably and the kolkhozniks' income has grown with it, this has had a favorable influence on the material well-being of the native population.

2. Reindeer breeding is the second most important branch of the national economy in the Okrug, while in the Bystrinskiy raion it has primary significance.

Extensive reindeer pastures and the relatively low cost of reindeer products as well as the wealth of centuries of experience of the local population and their skill at reindeer herding favour improvement in the growth of this primordial branch of the economy. Development of reindeer herding will facilitate the further improvement in the material well-being of a considerable part of the indigenous population dwelling in the interior of Kamchatka.

3. It must be admitted that the third main branch of industry, hunting, is not fully and satisfactorily developed. With the exception of the Komandorskiy Ostrova, the fur trade in the national raions is carried on independently by individual hunters who are equipped with primitive gear. Hunting is not organized in depth in the kolkhozes. The material stimuli for development of the hunting trade are inadequate.

Hunting may be profitably combined with fishing since its season falls on the seasons between fishing periods. Its valuable product may be exported by any transportation means, including air transport. The hunting trade facilitates a fuller development of the natural resources above the ground and is a reliable means for improving the income of the local population.

## CHAPTER 10

### PROBLEMS OF LABOR RESOURCES AND POPULATION

The problem of labor resources in Kamchatka is one of the most acute and complex. Its peculiarities are determined by the specific characteristics of the national economy and the geographic position of Kamchatka.



The Kamchatskaya Oblast' is one of the most sparsely populated sectors of the Soviet Union. Its total population as of January 1959 was 220 thousand person, this is approximately 0.1% of the population of the USSR, 0.2% of the population of the RSFFR and 5% of the population of the Dalne-Vostok. The population density in the Oblast' is 0.47 persons per square kilometer, this is 1/20th of the average density of population throughout the USSR, 1/15th of the density in the RSFFR and about 1/3 the density in the Dalne-Vostok.

Of Kamchatka's total population, 63.6% (140 thousand persons) live in towns and workers settlements, this exceeds the average ratio of urban population throughout the USSR and the RSFFR. The ratio of urban population is higher than Kamchatka's only in such great industrial Oblasts and Krays as the Moskovskaya, Leningradskaya, Sverdlovskaya, Chelyabinskaya, Kemerovskaya, Ivanovskaya, Murmanskaya, Kaliningradskaya, Magadanskaya and Sakhalinskaya Oblasts, the Khabarovskiy and Primorskiy Krays. This testifies to the fairly high standard of industrial development in the Oblast'.

There is only one city in Kamchatka, this is Petropavlovsk. It was formed as and grew as the administrative, cultural, economic and transport center of the Oblast'. Thirteen workers settlements have grown up mainly around the large rybokombinats. The development of the fishing industry, organization of rybokombinats and the associated with it workers' settlements have resulted in a rapid increase in the city population. Thus, from 1926 through 1956 the population of the Oblast' grew twelvefold, while the city population grew by more than seventyfold and its ration increased from 7 to 64%.

During this period the rural population grew by only 3.8 times (80 thousand persons in 1959 as against 20.9 thousand persons in 1926). Such a relatively slow growth of the rural population in comparison with the urban population is accounted for mainly by the fact that the rural economy in Kamchatka is of a subsidiary nature. Most of the rural population in the coastal regions is engaged in fishing. Many villages have grown so much, due to the development of industry in them, that they have been converted into workers' settlements.

Nearly half the population live in the four coastal fishing raions of the Oblast' (in the Elizovskiy, Sobolevskiy, Ust'-Bolsheretskiy and Ust'-Kamchatskiy raions), while about 1/3 of the population live in the Oblast' center of Petropavlovsk and its adjacent workers' settlement of Industrial'nyy.

One of the peculiarities of the population make-up in Kamchatka is that the ratio of males and persons of working age is higher here than the average for the USSR. This peculiarity is directly connected with the particular conditions of development in Kamchatka and the nature of development of the economy. During the first period of development in the remote and climatically harsh region there was a great influx of men without their families. Later, when living conditions had been improved, the families arrived. Many single people, mainly males, also arrived. At the present time about 15 to 20 thousand seasonal workers come to Kamchatka yearly; males of working age predominate. Population movements to the Oblast' are shown in Table 117.

Enormous expenditures are made yearly on movement of workers into and out of the Oblast'. Thus, the expenditures associated with recruiting of workers for the Glavkamchatrybprom (Chief Administration for the Fishing Industry in Kamchatka) came to 442 million rubles for only the fifth five-year period. Besides this, the result of continual change of cadres is that there is always a large number of novices working in the establishments of Kamchatka, these do not have the necessary knowledge, experience and qualifications and this shortcoming has a negative influence on work productivity and the cost of the products.

The structure of the population engaged in the national economy of the Kamchatskaya Oblast' is distinguished by a number of peculiarities (Table 118).

TABLE 117

PHYSICAL POPULATION MOVEMENT IN KAMCHATKA

(IN THOUS. PERSONS)\*

YEAR	ARRIVED	DEPARTED	INCREASE
1954	21,8	15,3	6,5
1955	20,5	15,9	4,6
1956	24,6	18,6	6,0

\* Data refer to urban localities, since migrations in rural areas are disregarded. The noticeable increase in physical movement of population in 1956, in comparison with preceding years, is accounted for by the fact that earlier estimates were based on only 10 communities, while now these are based on 13 communities.

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TABLE 118  
POPULATION DISTRIBUTION, NATIONAL ECONOMY,  
USSR AND KAMCHATSKAYA OBLAST' BY MATERIAL PRODUCTION  
BRANCHES AND NON-PRODUCTION BRANCHES (%)

BRANCHE OF THE NATIONAL ECONOMY	USSR (1956)	KAMCHATSKAYA OBLAST' (1 JAN. 1957)
Total employed on the national economy	100,0	100,0
Material production branches	85,0	79,0
Of these:		
Industry, construction, transport, communication	37,0	63,8
Agriculture & Forestry	43,0	9,1
Other	5,0	6,1
Non-Production Branches	15,0	21,0

It should be noted that the managerial staff in the productive branches of the economy is also too large. Of the total number of workers and office staff who are engaged in industry in the Kamchatskaya Oblast', the workers make up only about 70%, which is considerably less than the average for the USSR. This negative phenomenon ought to be removed.

The low ratio of students is characteristic for Kamchatka. This is associated with the wide dispersion and low density of the population, as a result of which there was only one Vooz (Higher Educational Institution) in the Oblast' and a small network of High schools and Specialist's schools.

Further, a high ratio of the population in Kamchatka is engaged in the domestic economy, this is conditioned by the distribution of the population throughout small settlements where the subsidiary and auxiliary industries are poorly developed; there is a lack of educational facilities, health and trade facilities which could empty second and third member of families.

A considerable number of the people engaged in the domestic economy in Kamchatka represent a labor reserve which, under specific conditions, could be used on state production. In spite of the great influx of population and the available reserves, the national economy of the Kamchatskaya Oblast', and particularly the fishing industry, experiences a shortage in the labor force.

The main reason for such a situation is the pronounced seasonal character of the fishing industry. During the period of maximum operations (the third quarter) the requirement for workers is nearly twice that for the period of minimum work volume (first quarter). The average figures for workers in the industrial establishments of the Kamchatskiy sovnarkhozes during the year 1958 are given below:

Months	Persons	Ratio of the monthly average numbers to the yearly average in %
January	18,867	85.7
February	20,402	88.1
March	20,020	86.5
April	20,014	86.5
May	22,217	96.0
June	26,134	112.8
July	30,484	131.7
August	29,680	128.1
September	26,203	113.1
October	22,829	98.5
November	20,374	87.8
December	19,938	86.1

Average for the year 23,180 100.0

Rational utilization of labor resources and the removal of fluctuation in the population, associated mainly with the introduction into Kamchatka of a large number of seasonal workers, is one of the most important conditions for successful development of the productive forces of the Oblast'.

In the perspective of the next 10-15 years the national economy of the Kamchatskaya Oblast' will largely retain its specialization. Fishing will remain the main branch of the Oblast' economy. It will take at least another 7 to 10 years before new branches of the industry will appear which will extend the economic profile of the Oblast', these would be oil, mercury and other minerals.

Widespread work on transportation, as well as on living and cultural facilities, should receive extensive development in the future period. All this improvement in the Kamchatskaya Oblast' economy will have a decisive influence on the labor balance of the Oblast'.

In the future the ratio of active sea fishing will increase by approximately twofold in comparison with the present level. The development of the active fishing will result in the essential elimination of the seasonal nature of fishing. The processing establishments in the south of Kamchatka will receive raw materials practically the year round, this will improve the utilization of the labor force.

Estimates show that the total number of workers and administrative personnel in the fishing industry will increase in the future. There will also be an increase in the labor force in other branches of the economy. There will be about 1 thousand workers employed in the coal industry which, at the present time, is essentially non-existent in Kamchatka, while forestry will employ about 5 thousand workers, this is about 10 to 15% more than are so employed at the present time.

During the course of the future period, construction will greatly expand in Kamchatka (ports, roads, industrial establishments, living quarters, etc.). This will require a considerable number of construction workers, some of which will remain on the project after its completion as maintenance men, and a part will go over to other branches of the economy (engineering works, building materials industry, etc.) or onto new construction. Taking into consideration the productivity of labor in the construction industry the number of workers in this industry will increase by 15 to 20% in comparison with 1957, and will amount to approximately 10 thousand persons.

In connection with the great growth of active fishing, the development of coal deposits, the increase in the volume of work in forestry, opening up of construction and the further growth of vehicular transportation, repair shops will have a large role to play in Kamchatka (repair and overhaul of boats, trucks, mining equipment, construction machinery etc.). In its own turn this will cause an increase in the labor force, in the engineering industry and metalworking by approximately 6.5 thousand persons.

Large scale construction results in a boom in the building materials industry and the number of workers in that branch will increase by 35 to 40% i.e., approximately 1 thousand persons.

There will be a considerable increase in local light and food industries for the purpose of better supplying the population with consumer goods. The numbers of workers and administrative personnel in other branches of industry will remain approximately at the present level.

The overall growth in the numbers of workers by individual branches of industry for the future period in comparison with 1956 given in Table 119.

The development of the productive forces of the Oblast' on the basis of technical progress will require more and more specialists with high qualifications from various fields. The growth in population and the increase in the ratio of children will raise the necessity for organizing a large number of new schools and the provision of an additional number of teachers. Improved medical services will require increased numbers of medical personnel. In connection with this, the need will rise for extending the network of High schools, while in the future it will be necessary to organize establishments of higher education (Vooz) which will make it possible to train cadres on the spot. This will also facilitate the consolidation of population and the settlement of workers and will reduce the requirement for transient specialists.

As a result of the extension of the network of secondary schools the ratio of students in the future labor reserve balance must increase.

In connection with the fact that the labor force in Kamchatka in the future will become more stabilized, the population structure of the Oblast' will become more "normal", i.e., the ratio of people of working age will go down and the ratio of children will go up. This change in the population structure means that the increase of labor resources in the Oblast' by 35 to 40% will result in an overall population increase of approximately 50%. Thus, the Kamchatka population at the end of the period under consideration will amount to about 300 thousand persons, in which the ratio of workers will be somewhat lower in connection with the increase in the ratio of children and unemployables.

**TABLE 119**  
**AVERAGE NUMBERS OF WORKERS IN KAMCATSKAYA**  
**OBLAST' IN 1956 (FOR THE FUTURE PERIOD BY BRANCHES OF**  
**(IN THOUS OF PERSONS)**

BRANCH OF INDUSTRY	1956	FUTURE	FUTURE DENSITY IN 0/0 OF 1956 DENSITY	RATIO (o/o)	
				1956	FUTURE
Electrical Energy					
Production	0,2	0,5	250	0,7	1,4
Fuel	0,1	1,0	1000	0,3	2,8
Machin-Shop & Metal-					
Working	3,9	6,5	167	13,3	18,5
INCL:					
Shipbuilding	1,5	2,5	167	5,1	7,1
Repair					
Work	1,9	3,0	158	6,5	8,6
Other	0,5	1,0	200	1,7	2,8
Production of					
Building Materials	0,6	1,0	167	2,0	2,8
Lumbering & Wood -					
Working	3,2	3,5	109	10,8	10,0
Light Industry	0,5	1,0	200	1,7	2,8
Food Industry	20,8	21,5	103	70,5	61,1
INCL:					
Fish	19,9	20,0	100	67,5	56,8
Other	0,9	1,5	168	3,0	4,3
Other Branches of					
the Economy	0,2	0,2	100	0,7	0,6
Sub-Totals for					
all Industry	29,5	35,2	119	100,0	100,0

The make-up of the population and its distribution in the next 10 to 15 years is shown in Table 120.

The characteristic trait in the population's structure of the next 10 to 15 years is the further growth in urban population. This is accounted for by the fact that large worker's settlements and possibly even towns will grow up around the main fish industry bases. The rural economy will increase insignificantly, while its population ratio will go down.

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TABLE 120

APPROXIMATE NUMBERS & DISTRIBUTION OF POPULATION

IN KAMCHATKA IN THE NEXT 10-15 YEARS\*

RAION	TOTAL POPULATION		INCLUDING			
	THOUS PERSONS	RATIO OF RAIONS	URBAN		RURAL	
			THOUS. PERSONS	RATIO IN THE RAION	THOUS. PERSONS	RATIO IN RAION POPULATION
Aleutskiy	1	0,3	--	--	1	100
Bystrinskiy	2	0,7	--	--	2	100
Elizovskiy	36	12,0	7	19	29	81
Mil'Kovskiy	12	4,0	--	--	12	100
Sobolevskiy	36	12,0	23	64	13	36
Ust'-Kamchat- skiy	39	13,0	30	77	9	23
Ust'-Bolsher- etskiy	45	15,0	35	78	10	22
Karaginskiy	10	3,3	4	40	6	60
Olyutorskiy	16	5,4	8	50	8	50
Penzhinskiy	4	1,3	--	--	4	100
Tigil'skiy	9	3,0	3	33	6	67
City of Petropavlovsk	90	30,0	90	100	--	--
Total for the Oblast'	300	100,0	200	67	100	33

\* Population growth by raions is based on data for development of the National Economy with consideration given to natural and artificial increases.

## CHAPTER 11

### PROBLEMS OF COMPOSITE DEVELOPMENT OF THE NATIONAL

#### ECONOMY IN THE KAMCHATSKAYA OBLAST'

##### 1. Questions of Specialization and Composite Development.

The conditions described allow, as has been stated in the introduction, an examination of the problems of composite development of the national economy in Kamchatka only as a hypothesis. Such a hypothesis, or a prognosis of the development of the national economy along its basic lines, must be guide to planning the future development of the national economy and the drawing of plans for scientific-experimental and design work. Further studies of the natural riches of the Oblast' and the technical-economic solution to the problems of their utilization will make it possible to verify and appropriately alter the ideas on the development of the national economy of Kamchatka.

#### Questions on the Development of the Fishing

##### Industry

The main task of Kamchatka's economy in the next 10 to 15 years is the increase of fish catch by 2.5 to 3 times and the conversion of the fishing industry into a profitable branch of the economy. The fulfillment of this task requires universal development of active fishing far from the shore and increased inshore fishing. Concentration of the fish processing plants, improvement of the variety of products and reconstruction of transport.

Development of active fishing (up to 70% of the total catch) will be accompanied by a reduction in the seasonal nature of the industry and lowered cost of the catch. The ratio of winter catch (first and fourth quarters) will increase in the future period by 25% i.e., approximately double the present level. The cost of ship-caught fish will be lowered by approximately 30 to 40%, this will result in a corresponding lowering in the cost of catch as a whole for the fishing industry in Kamchatka.

#### UTILIZATION OF MINERALS

The available geological information and contemporary knowledge of minerals in the Kamchatskaya Oblast' permit the statement of the question concerning the expediency of utilizing some minerals for their export beyond the confines of the Oblast'. This applies first of all to the deposits of mercury, oil, some sulphur deposits and others.

Mercury is one of the most important and scarce metals. In connection with this, there is considerable interest in the discovery of a new mercury province in the Kamchatskaya Oblast' within the confines of the Koryakskiy Khrebet.



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Estimated reserves of mercury in the deposits of this raion at the present time are not great, and the present problem is one of organizing the mining operation. However, the prognosis on the value of the ore reserves of mercury in the Koryakskiy highland provides the basis for considering the Kamchatskaya Oblast' as a future mercury producer.

As is known, mercury refineries are very compact, they do not require large areas for their buildings nor do they require large expenditures of fuel and electrical energy. Reliable operation of a plant in the northern part of the raion will be assured by an automobile road from the Zaliv Korfa over a distance of 300 kilometers and by a small electric power station operating on Korf coal. These features of mercury production are very important under the conditions in the poorly developed regions such as the Kamchatskaya Oblast'.

The question of oil. As is known, the Far East is a region in which there is a dire scarcity of oil. The Sakhalin oil field covers, at the present time, about 1/3 of the oil requirements. Petroleum products are brought in by railroad to the Far East over distances of many thousand kilometers from the regions of the "Second Baku", while Kamchatka and the Magadanskaya Oblast' receive oil by sea through the Far East ports. The hauling of large quantities of petroleum products from a great distance into the southern regions of the Far East as well as onto Kamchatka and to the Magadanskaya Oblast' via a complex transportation route (railroad to the ports and further by sea and automobile road) results in the yearly expenditure of billions of rubles on transportation.

The fuel balance in this country is being reoriented in the direction of an increased ratio of oil, which is the result of technical progress and the requirements of the economy. The total production of oil in the USSR in the next 15 years must increase to 350 to 400 million tons as against 98.3 million tons in 1957, while the ratio of oil and gas in the fuel balance must increase from 33.0 to 64.0%. Considering the known and anticipated growth in productive forces in the Far East within the next 10 to 15 years, the overall deficit of oil and petroleum products at the end of the stated period amounts to many millions of tons for the Far East. Besides this, it is expected that oil extraction in Sakhalin will reach its practical maximum. Under these conditions the discovery of large oil deposits in the Far East has taken on great national economic significance.

Up to the present time, the most detailed investigations for oil have been carried out on the Voyampol'skiy and Bogachevskiy areas of Kamchatka. However, industrial deposits have not been found.

An analysis of the oil found in the Bogachevskiy deposits shows that it relates to the type of light oils with a high ratio of benzene-ligroin fraction. According to preliminary estimates made by the All-Russian Scientific-Experimental Geological Institute (VNIGRI), there should be large oil deposits in Kamchatka. When these prognoses have been confirmed by geological prospecting parties Kamchatka may become an important oil-bearing region in the East of the nation.

- 141 -

Lack of knowledge concerning the availability of oil in Kamchatka does not permit a sufficiently sound economic estimate of the prospects for utilizing oil deposits in this Oblast' at the present time.

The economic problems of utilizing deposits of Kamchatka oil can be examined by analogy with the Sakhalin fields, insofar as these have many common features including geology, formation of deposits, as well as difficulty of development, by making a comparison between the initial period of development of the oil fields in Sakhalin and the present situation in Kamchatka.

Geologic prospecting and development drilling in Sakhalin was one of the most expensive in the USSR, the cost of the oil obtained is also amongst the highest (150 rubles per ton as against 20.0 rubles per ton for Bashkirneft' (Bashkir-oil). In spite of this, the cost of oil at the Khabarovsk Refinery is considerably lower than the cost of imported oil, it is the cheapest in the USSR. However, in the event that the Khabarovsk Refinery cost of Sakhalin oil and Bashkir oil will become equalized in the future then it is expedient to develop the oil fields in the Far East by all means possible.

Of utmost importance to the question concerning utilization of oil deposits in Kamchatka is the task of a more uniform distribution of the oil industry over the territory of the nation. It must be borne in mind that throughout the expanse from the Urals, Turk'men and Kazakhstan to Sakhalin, in spite of persistent long-term efforts, oil deposits of industrial significance have not been found to this time. The most promising area is Yakutia. This gives great importance to the problem of distribution of oil fields in the East.

It must be stated that the problem concerning Kamchatka oil has not been given due attention up to this time. For the past 30 years prospecting for oil has been done by means of individual boreholes and the scale of prospecting is meagre. Thus, in the past 10 years, deep prospecting drilling has been carried out only at two disconnected areas in the Bogachevskiy and Voyampol'skiy deposits, where 8 boreholes have been put down, of which only 3 have been brought to production. In comparison it will be stated that in 1953, in Sakhalin, at the Okhinskiy, Ekhabinskiy and other oil fields more than one thousand wells were in operation.

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OF THE SECRETARY OF STATE  
BUREAU FOR TRANSLATIONS,  
FOREIGN LANGUAGE DIVISION

SECRET

CANUKUS EYES ONLY

Copy No 20

JIB(CAN) JIB(CAN) 10/66

DATE 17 May 1966

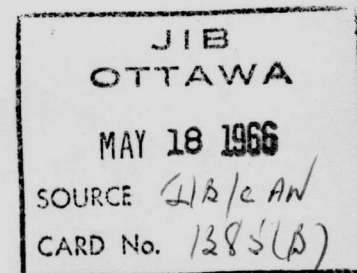
# JOINT INTELLIGENCE BUREAU Ottawa

Communist Economic and Military Aid  
Activities in the Less Developed Areas

April - 1966



JOINT INTELLIGENCE BUREAU  
Department of National Defence  
OTTAWA, CANADA



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Communist Economic and Military Aid  
Activities in the Less Developed Areas

April, 1966

PART I - ECONOMIC AID

GENERAL

Soviet Trade with the Less Developed Areas

1. At the recent Party Congress Prime Minister Kosygin spoke at length on the Soviet Union's economic relationships with the less developed countries. He forecast that there would continue to be a moderate growth in trade over the next five years but it was unlikely that the pattern of trade would undergo any spectacular change. The volume of Soviet exports to the less developed areas is, to a large extent, related to its deliveries under economic aid agreements, which have been relatively stable in recent years. In his report Kosygin restated the political implications of Soviet trade with the less developed countries and indicated that there would be a considerable increase in the volume of Soviet deliveries of complete plants and equipment to the less developed areas in the future with most of it being procured under long-term economic credits.

2. Soviet imports from the less developed countries are also likely to reflect a moderate growth. Kosygin has specified increased purchases of traditional Soviet imports such as cotton, wool, food-stuffs, hides and non-ferrous metals. These imports will reflect repayments in goods by the less developed countries for Soviet assistance. According to a U.S. report these repayments may reach \$300 - \$400 million annually by 1970. (SECRET)

MIDDLE EAST

Iraq

3. A large number of Bulgarian engineers are currently employed on the construction of a new civil airport in Baghdad.

.../2

SECRET  
CANUKUS EYES ONLY

000603

- 2 -

SECRET

JIB(CAN) 10/66

Bulgaria has also been awarded contracts for sewer projects in Baghdad and the construction of a number of bridges. The total value of the contracts awarded to Bulgaria is estimated at about \$28 million (US).

4. The work involved in these contracts means that the number of Bulgarian engineers and technicians working in Iraq may be increased to about 700 by the end of 1966. (SECRET - CANUKUS)

#### Syria

5. Following discussions in Damascus and Moscow the Soviet Union has extended Syria a credit reported to be valued at \$140 million for the construction of Syria's long-planned Euphrates Dam project. According to an agreement concluded in 1963 this project was to be constructed by West Germany at a cost of \$87.5 million. However, technical differences between West Germany and Syria concerning the construction of the dam resulted in West Germany withdrawing from the project. In addition, the nationalization of a West German oil concession by the Syrian government in late 1965 probably influenced the West German government's decision. (RESTRICTED)

6. Previous Soviet economic aid to Syria was extended in 1957 and was valued at \$150 million of which only \$40 million has been drawn. (SECRET)

7. A Syrian government delegation visiting Bulgaria early in May, 1966 has concluded economic and technical aid agreements with Bulgaria. Formal signing of the agreements will take place in Damascus in June 1966. The economic aid agreement provides for a Bulgarian credit of \$15 million with repayment over 5-8 years at 2.5 per cent interest to be used for industrial and agricultural projects. Bulgaria has also agreed to prepare studies on surface and underwater resources in Syria.

#### UAR

8. The United Arab Republic and Communist China concluded a \$9 million trade agreement on 1 May under which China will purchase Egyptian cotton, rayon, peanuts, linen and phosphates. The UAR will buy tea, meat, sugar, cooking oil and tin from Communist China. (UNCLASSIFIED)

.../3

SECRET  
CANUKUS EYES ONLY

- 3 -

SECRET  
CANUKUS EYES ONLY

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Yemen

9. Early in 1966 about 100 Soviet technicians and their families arrived in Yemen. The technicians are reported to be employed on the Soviet sponsored Hodeida-Taiz road project. It is estimated that about 800 Soviet technicians are now employed in Yemen on a variety of projects, including roads, schools, a fish cannery, an agricultural project and a geological survey.

(CONFIDENTIAL - CANUKUS)

AFRICA

Tunisia

10. Tunisia has concluded an agreement with the Soviet Union for the construction of a dam on the River Rezaia. The plans for the construction of the project will be drawn up by the Soviet Union, which will also supply the material, equipment and technical personnel.

11. Tunisia accepted Soviet credit for \$28 million in 1961, which was obligated for the construction of at least three dams and a technological institute. Approximately \$9 million has been drawn from the Soviet credit to date.

(RESTRICTED)

ASIA

Ceylon

12. A Ceylonese government delegation visited the Soviet Union recently to discuss economic and technical cooperation between the two countries. Soviet aid in the construction of industrial development projects was examined, including a steel works and a tire plant currently being constructed under a Soviet loan for \$30 million extended in 1958. No details of a new aid agreement were announced but it is reported that the Soviet Union has been willing for some time to provide assistance for Ceylon's fishing industry.

(UNCLASSIFIED)

.../4

SECRET  
CANUKUS EYES ONLY

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- 4 -

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CANUKUS EYES ONLY

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Indonesia

13. An Australian report has confirmed recent press announcements that Communist China has formally terminated its economic aid programmes in Indonesia. China's economic assistance to Indonesia started in 1957 and at the end of 1965 the total value of aid extended was about \$107 million (US). A shipment of 20,000 tons of rice expected from Communist China in 1966 is believed to have been cancelled.

(CONFIDENTIAL)

14. According to a UK report, at the end of 1965 Indonesia had defaulted on its repayments to communist countries and was seeking to reschedule existing payment obligations. These arrears are now estimated to have reached a value of about \$200 million and are mainly on account of previous military equipment purchases. According to several reports Indonesia is considering a request for a general moratorium on its payment obligations.

Pakistan

15. Yugoslavia has extended a \$30 million credit to Pakistan for industrial projects under Pakistan's current five-year plan. This credit is in addition to over \$40 million already made available by Yugoslavia for the Gomal Dam project and hydroelectric power projects in East and West Pakistan.

(UNCLASSIFIED)

Singapore

16. Under a recent agreement Bulgaria has agreed to take part in several joint industrial ventures with Singapore and to provide technical assistance for industrial projects. The Singapore government has signified its intention to purchase machinery and fertilizers from Bulgaria.

(RESTRICTED)

17. Following a series of meetings with a Soviet economic delegation an agreement was concluded in April between the Soviet Union and Singapore under which the Soviet Union will provide technical and economic assistance to Singapore for its industrial development programme. The value of the Soviet aid was not disclosed although the terms of the agreement are reported to include repayment over 12 years with interest at 2.5 percent to be made in manufactured goods or convertible currency.

(RESTRICTED)

.../5

SECRET  
CANUKUS EYES ONLY

- 5 -

SECRET  
CANUKUS EYES ONLY

JIB(CAN) 10/66

LATIN AMERICA

Argentina

18. According to press reports Communist China may be seeking to purchase 200,000 metric tons of corn from Argentina. While there is no confirmed evidence that negotiations are in fact underway, representatives of a Chinese Communist state grain trading agency are reported to have travelled to Argentina in April and may have concluded an agreement at that time. The current Argentine corn crop is reported to be one of the largest ever harvested and is expected to yield a surplus of about 4 million metric tons.

19. Argentina was one of Communist China's major western grain suppliers in 1965 and under two agreements concluded in 1965 contracted for a total of 2.5 million metric tons of Argentine wheat. However, since there has been a sharp decline in its current wheat crop the Argentine Grain Board has announced that it cannot permit sales of substantial amounts of wheat to Communist China in 1966 and 1967.

Brazil

20. A Brazilian firm is reported to be discussing a barter deal with the Soviet Union under which 20,000 tons Brazilian rice would be exchanged for 5,000 tons of Soviet zinc. In 1965 Brazilian-Soviet trade was valued at \$76 million with the Soviet Union supplying aluminum, chemicals, zinc, machinery and some petroleum derivatives. Brazilian deliveries included 18,000 tons of coffee, 12,000 tons of cotton, cocoa and other tropical products. (UNCLASSIFIED)

21. Following a visit to East Germany a Brazilian government official is reported to have stated that East Germany has offered to extend a \$70 million credit to Brazil to be utilized for the purchase of medical and scientific equipment. This is the first serious credit offer Brazil has received from East Germany and probably involves a commercial-type loan similar to the credits extended to Brazil by Czechoslovakia, Poland and Romania. (RESTRICTED)

Chili

22. The Chilean Mantos Blanco Mining Company has sold 1,600 tons of Chilean copper to Communist China for delivery in the first quarter of 1965. Payment was to be made in sterling. Communist China purchased a total of 11,500 tons of Chilean copper in 1965. (CONFIDENTIAL)

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SECRET  
CANUKUS EYES ONLY



- 6 -

SECRET  
CANUKUS EYES ONLY

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PART II - MILITARY AID

AFRICA

Uganda

23. At the beginning of April two Polish ships are reported to have arrived in Mombasa with arms for Uganda. The Ugandan president (then prime minister), Dr. Obote, is said to have asked President Kenyatta for permission, which was granted, to allow the arms to be moved across Kenya. There is no information on the nature of the equipment, which, coming in Polish ships, may be from Czechoslovakia. (SECRET CANUKUS EYES ONLY)

Rhodesia

24. The Rhodesian police have claimed that Chinese weapons were recovered after a clash with African nationalists on 29 April in which seven Africans were killed. The police also say that those taken into custody disclosed that they received terrorist training and political indoctrination in China. (UNCLASSIFIED)

25. A British report states that London has been aware that both Russian and Chinese arms have been supplied to both Rhodesian African nationalist organizations, ZAPU and ZANU, and that members of the latter have been trained in China. The British also report the capture by Zambian police on 26 April of a small consignment of arms, including some of Chinese manufacture, on the way from Tanzania to ZANU in Lusaka. (SECRET)

ASIA

Pakistan

26. Reports continue to be received of the recent acquisition of Chinese arms by Pakistan. Up to the end of April estimates of the number of T-59 tanks in Pakistan had reached 100 and of MIG-19/FARMER jet fighters about two dozen. There are reports that China is to supply 100 aircraft and up to 500 tanks. One British report cites the Indian MA in Peking as saying that a Pakistani purchasing team had arrived there in March with "credits for \$60 million for the purchase of hardware". There has been no information on the movement of this equipment into Pakistan, other than one Indian press report that 50 "U-59" medium tanks, received from China as a gift along with 50 MIG-19s, are believed to have come by the Gilgit-Sinkiang road. (SECRET/CANUKUS EYES ONLY)

SECRET  
CANUKUS EYES ONLY

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CANUKUS EYES ONLY

JIB(CAN) 10/66

TABLE I

Communist Economic Aid Extensions

1 January - 30 April 1966

By	To	(Million \$US)		Total
		Project Aid	Other Loans	
Soviet Union	Iran	290.0		290.0
	Pakistan	20.0		20.0
	Syria	140.0		140.0
	* Turkey	33.0		33.0
		483.0		483.0
Czechoslovakia	Pakistan	70.0		70.0
		70.0		70.0
Hungary	India	52.5		52.5
		52.5		52.5
Bulgaria	Syria	15.0		15.0
		15.0		15.0
	TOTAL	620.5		620.5

\* The value of the Soviet loan to Turkey in 1965 has been revised upward to \$200 million, an increase of \$33 million.

SECRET  
CANUKUS EYES ONLY

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JIB/CAN FOLDER

Copy No. 72

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DATE 10 June 1966

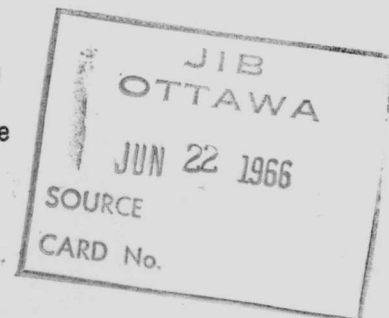
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ITEMS OF ECONOMIC AND TOPOGRAPHICAL  
INTELLIGENCE FROM CANADIAN SOURCES

MAY 1966

(Unevaluated Information)

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OTTAWA, CANADA



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ITEMS OF ECONOMIC & TOPOGRAPHICAL  
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May 1966

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<u>CHINA</u>			
I	SHIPPING - Boarding Report: Hsinkang, 21-30 March 1966	904-2000-6-1 (S)	1
II	SHIPPING - Boarding Report: Shanghai, 8-11 March 1966	904-2000-6-1 (S)	2
<u>FINLAND</u>			
III	FISHING GROUNDS - Treaty, December 1965	930-2000-11 (S)	3
IV	TOPOGRAPHICAL INTELLIGENCE - Coast Guard and Boats, December 65	930-2000-11 (S)	4
<u>TURKEY</u>			
V	TRANSPORTATION - Ankara, 23 April 1966	ELLIST-RETENTION (S)	5
<u>USSR</u>			
VI	AIRCRAFT INDUSTRY - Tbilisi, Airframe Plant No.31, April 1966	922-2000-11 (S)	6 - 10
VII	CONSTRUCTION - Gas Pipeline, Ulitsa Kirova, 2-4 March 1966	STOWELL-RETENTION (S)	11
VIII	ELECTRONICS - Palm Tree, Ulitsa Lenina, 2-4 March 1966	STOWELL-RETENTION (S)	12

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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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ITEM	COUNTRY & SUBJECT	CLASS'N	PAGE
	(USSR continued)		
IX	MARKINGS - Aircraft, Vnukovo and Baku/Bina Airfields, April 66	922-2000-11 (S)	13
X	MARKINGS - Aircraft, Sheremet'yevo, 29 March 66	FREEBOLD - RETENTION (S)	14
XI	TOPOGRAPHICAL INTELLIGENCE - Black Sea Area, 5-8 March 1966	922-2000-11 (S)	15 - 19
XII	TOPOGRAPHICAL INTELLIGENCE - Air Trip, Moscow-Baku-Tbilisi 10-14 April 66	922-2000-11 (S)	20 - 29
XIII	TOPOGRAPHICAL INTELLIGENCE - Leningrad, Tallinn, 29 March-1 April 66	FREEBOLD - RETENTION (S)	30 - 37
XIV	TOPOGRAPHICAL INTELLIGENCE - Petrozavodsk, 5 May 1966	100-2000-10-750 (S)	38 - 40
XV	SHIPPING - Merships: Passenger Liner ALEXANDR PUSHKIN, Montreal 27-30 April 1966	922-2000-6-1 (S)	41 - 42
XVI	SHIPPING - Merships: Tanker LISICHANSK, Halifax 23-29 March 1966	922-2000-6-1 (S)	43
XVII	SHIPPING - Merships: Cargo Motorship NIKOLAYEV, Halifax 27 March-14 April 1966	922-2000-6-1 (S)	44 - 48
XVIII	SHIPPING - Merships: Cargo Motorship POLTAVA, Halifax 12-14 February 1966	922-2000-6-1 (S)	49
XIX	SHIPPING - Fishing Fleets: Trawler ALIOTH, Halifax 4-6 May 1966	922-2000-6-1 (S)	50
XX	SHIPPING - Fishing Fleets: Motor Tanker YELSK, Halifax 27-28 February 1966	922-2000-6-1 (S)	51
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I

CHINA

SHIPPING - Boarding Report  
HSINKANG 21-30 March 1966

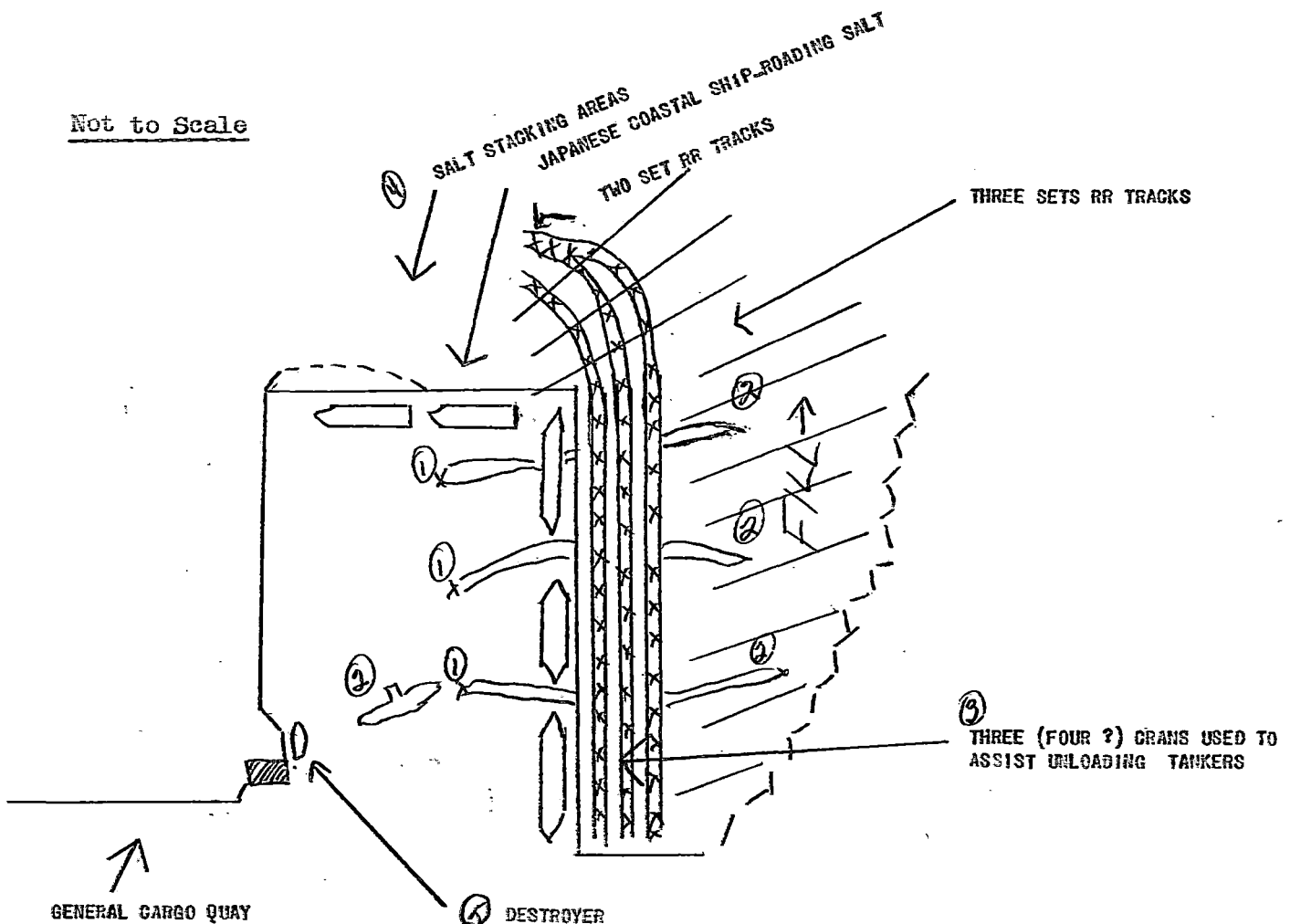
Port Information

1. Dredging continues.
2. Dredges - Operating Suction type. (See sketch)
3. Cranes used to move hoppers and evacuator machines, used particularly for discharging tankers.
4. Used as a loading berth - salt (Japanese Coastal Vessels) or nut-meat. Five hundred tons nut-meat was loaded at this wharf for Canada.

Report & Date: MC DER 17/66  
of 21 Apr 66

Source: DGI/INT S

Not to Scale



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JIB(CAN) 11/66

II

CHINA

SHIPPING - Boarding Report  
SHANGHAI 8-11 March, 1966

General Information

1. Source's vessel delivered a cargo of 10,800 tons of manufactured steel goods from ANTWERP to SHANGHAI and TSINGTAO. Source is of the opinion that the steelware delivered was suitable for "setting up" a factory. Some of the items included drilling machines, crates of micrometers, lathes, and numerous other machineshop tools.

Report & Date: WC DBR 16/66  
of 21 Apr 66  
Source: DGI/INT S

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III

FINLAND

FISHING GROUNDS

Treaty, December 1965

1. The restriction of U.S.S.R. of a 12 mile international boundary for fishing purposes encroached on most of the traditional Finnish fishing grounds in the Gulf of Finland. A new treaty has every chance of being accepted in which the U.S.S.R. will waive these rights and will settle for only sovereignty, only up to the international boundary. Up to five years ago all Finnish trespassers were vigorously arrested but recently there have been no such enforcements.

Report and Date: NHIL 05 of 20 Dec 65  
Source: CNA/Helsinki

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JIB(CAN) 11/66  
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IV

FINLAND

TOPOGRAPHICAL

Coast Guard and Boats

Dec 1965

1. The Coast Guard sponsor the Institute of Marine Research, whose major function is to provide ice reports of their coastline to subscribers. For this they receive reports from Sweden and U.S.S.R. It is noted that Leningrad has thick fast ice (21 Dec) and that Tallinn was ice-clear.

2. The Coast Guard is very much interested in an air-propeller-powered boat which can negotiate water, solid ice and broken ice. One of the Coast Guard prototypes were seen and another, being worked on by a civilian inventor. Trials to date have not been too satisfactory, mostly because of the engine drive to the propeller. The civilian inventor was awaiting delivery of a new air propeller from Canada to further his trials. They said some hovercraft principles added to the air propellor would probably give the right answer. Unfortunately very little money is available for research. They had heard of Russian experiments and that the title of "Hydro-copter" has been given this type of craft.

Report and Date: NHEL 05  
of 20 Dec 65  
Source: CNA/Helsinki

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JIB(CAN) 11/66  
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V.

TURKEY

TRANSPORTATION  
ANKARA Area  
23 April 1966

1. On 23 Apr 66, in company with the US/AAA, Source made a one-day trip out of ANKARA to get to know more of the country. His route was:

Highway E5 to Junction with Highway E23 - Highway E23 to road Junction 17 kms West of Kaman - Hirfanli Dam - South West on "country" road to Highway E5 - AKSARAY - NEVSEHIR - KIRSEHIR - ANKARA.

2. Road conditions were as follows:

- a. Highway E5 to Junction with Highway E23 - Good, hardsurfaced, two-way and mostly straight.
- b. Highway E23 to road Junction 17 kms West of Kaman - Gravel, two-way but somewhat winding.
- c. From Highway E23 to Hirfanli Dam - Gravel, two-way, mostly straight but with indications that it had been muddy during the wet weather.
- d. Hirfanli Dam to Highway E5 - Narrow, rutted, dirt road.
- e. Highway E5 to Aksaray - Mostly under reconstruction, two-way and fairly straight. Where pavement exists it is badly broken up.
- f. Aksaray to Nevsehi - Excellent, hard surfaced, two-way and fairly straight highway.
- g. Highway 41 from Nevsehir to Highway E23 - Gravel, mostly two-way but quite winding.
- h. Highway 23 to Kirsehir and road junction 17 kms West of Kaman - from the junction with Highway 41 to about 40 kms West of Mrsehir the road is mostly hard surfaced, two-way and fairly straight. The balance is gravel.

3. One of his many stops was at a bridge just before the Hirfanli Dam. Within a few minutes of stopping, a Turkish civilian official drove up and told him that stopping or photography was not permitted; so he moved on. Evidently they are sensitive about their dam.

Evaluation: A2  
Report and Date: TIR 27/66 of 9 May 66  
Source: CFA/Ankara

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JIB(CAN) 11/66

USSR

AIRCRAFT INDUSTRY

Tbilisi, Airframe Plant No. 31  
14 April 1966

1. The Canadian Military and Air Attaches were in Tbilisi 14 April 1966 where they made the following observations on Airframe Plant No. 31.
2. On the morning of 14 April, to reach this target observers caught a No 7 tram on Shaumyana near Bagatashvili Most and rode it to its eastern terminal which is located on Bogdan Khmel'nitskovo. Observers then proceeded on foot eastward along N side of factory compound, interrupted their return trip to climb to higher ground in an apartment area just N of the railway line for a brief though better view. There was no apparent surveillance but too much traffic on the roads and walkways for photography. For future reference - a No 16 bus runs from the tram terminal along the road N of the plant. Despite 8 foot wall, quite a good view can be obtained even on foot walking along the N roadway.
3. Very little activity was observed in the plant yard. One or two people were seen moving about and two cars appeared momentarily between the buildings. There was no visible effluent from the only two stacks noted and no interesting road or rail traffic in the vicinity of the plant.
4. On 13 April as observers approached the Employee's Club, a loud speaker produced renditions of "What'll I do" and "When Irish Eyes are Smiling" which sounded very much in the style of Victor Sylvester.
5. A partial sketch of the area and of some of the structures is given on the following pages:

(Sketch code)

- A - Terminus No. 7 Bus Route
- B - Edge of broadcasting site
- C - Elevated vantage point

(continued, page 8 )

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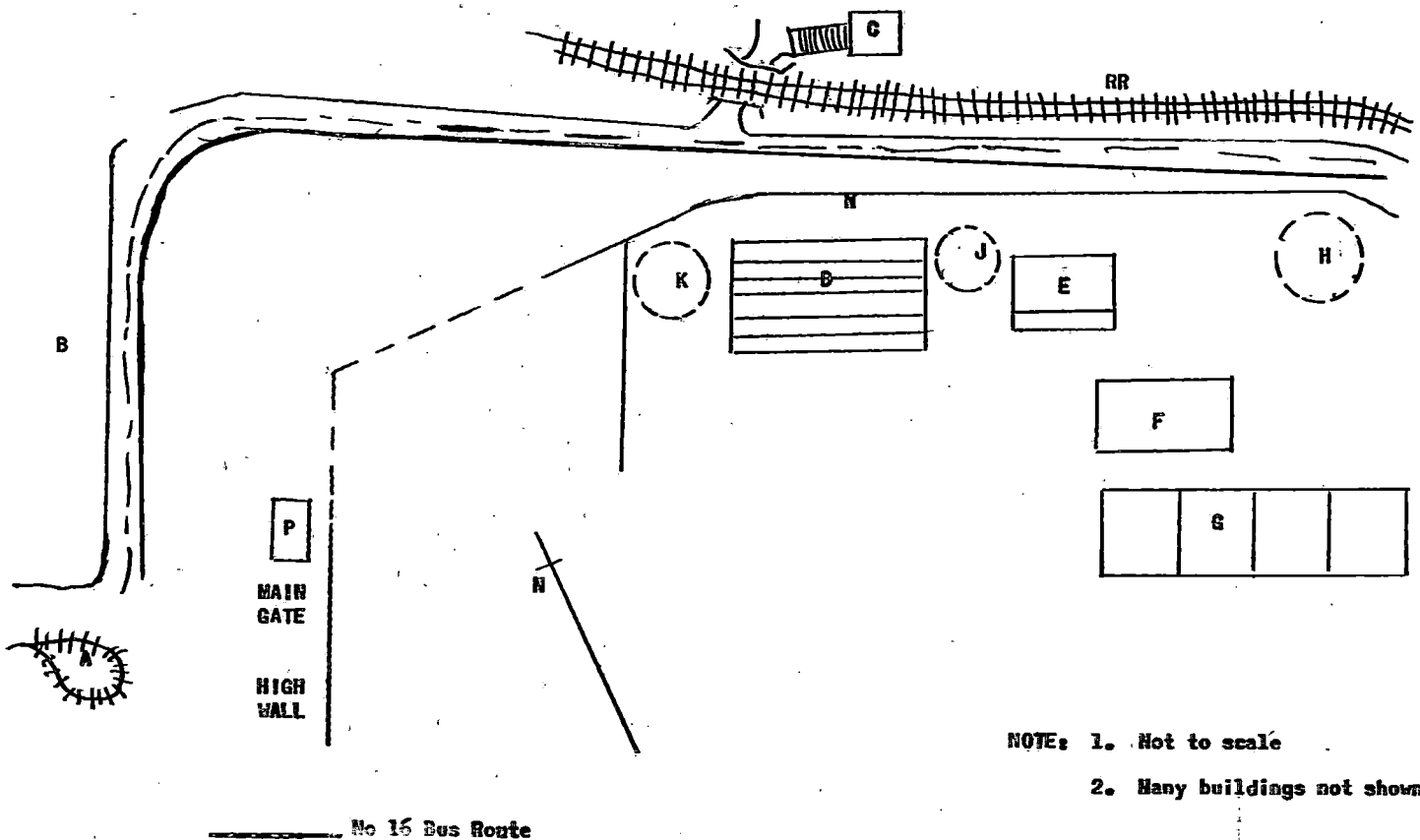
(Aircraft Industry Tbilisi,  
14 April Cont'd)

SECRET  
JIB(CAN) 11/66

<u>JIB</u> <u>Serial</u>	<u>Trip</u> <u>Serial</u>
200	10

DETAILS OF AIRFRAME PLANT No 31

TBILISI



NOTE: 1. Not to scale  
2. Many buildings not shown

SECRET

(Aircraft Industry Tbilisi,  
14 April Cont'd)

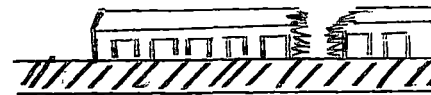
**SECRET**  
**JIB(CAN) 11/66**

- D - Quite new red brick building, many windows, est 200' long X 120' wide X 20' high. Nothing visible through windows. Appeared that inside, at least above the 10 - foot level, it is all clear space.

End view (E end)



Side view (N side)



2' N Wall

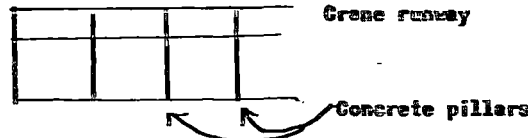
- E - Old black building low roof slanting toward plant wall from monitor roof.

Partial end view (W end)



- F - Overhead crane in open building est 20' high.

N-side view



Crane runway

Concrete pillars

- G - New building with lightly peaked roof; N side at least virtually all glass. Est 200' long by 40' high.

- H - Untidy open area with litter including a number of cylindrical blue metal containers est 5 - 6' long by 3½' in diameter with tapered ends

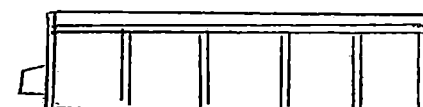


- J - Bundles of reddish packing material, small new crates and 3 large new raw-wood containers approx 25' long X 6' high X 5' wide with a small box-like protuberance built on one end.

End view



Side



These 3 containers appeared to be sitting several feet off the ground, presumably on a platform.

**SECRET**

(Aircraft Industry Tbilisi,  
14 April 1966 Cont'd)

SECRET  
JIB(CAN) 11/66

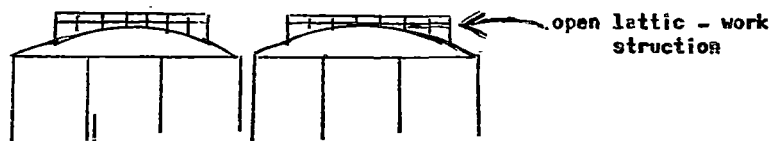
K - An area containing small quantities of construction materials including several small piles of bricks and one small pile of a red substance resembling crushed shale.

L - (2) 40 - foot black cylindrical metal stacks

M - 2 horizontal metal tanks

N - 8 - foot concrete and brick wall with a double strand of barbed wire along the top

O - (not shown on sketch) 2 or more quite new open hangar-like buildings located near F with a general appearance as shown:



P - Employee's club

JIB  
SERIAL

OBSERVATION

In the vicinity of HQ Trnascaucasus MD on PI Lenina were seen

1 Col      Tk on black  
1 Col      Mr on magenta  
2 Lt-Col   Arty on black  
1 Lt-Col   MR on magenta  
1 aged Engr Col on black  
2 Cpts     Sigs on black

180?      On the way to the airport approximately 10 km from the hotel (the speedometer was conveniently not working), on the right in a compound was seen a stack of perhaps 20 wing tanks in individual slatted crates. The brief glimpse did not provide any useful association. No rail cars or vehicles were in the vicinity.

165c      Approximately 1 km farther on the left, the top of a similar stack of wing tanks. The noses of some of them were painted black.

SECRET

000621

(Aircraft Industry  
Tbilisi, 14 April 1966 Cont'd)

SECRET  
JIB(CAN) 11/66

10

JIB  
SERIAL

14

OBSERVATION

The general impression of Tbilisi is a city with a large military population. The propenderance of summer field uniforms however made identification of troops very difficult for these observers. The proportion of military to civilian vehicles is also very high. Upwards of twenty-five VRN series were seen.

Report & Date: IR M-34/66 of  
18 April 1966.

Source: MA & AA/Moscow

SECRET

000622

(NIKOLAYEV, March-April 66)

SECRET  
JIB(CAN)11/66

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Figure 3 - Explanation

Free hand (not to scale) drawing of cross section No's 2, 3, 4 and 5 holds of Soviet dry cargo mer ship NIKOLAYEV at Halifax, N.S. April 1966, as seen from port side with ship's side cut away. All of these holds have the same configuration and fittings except that No. 4 hold is approximately 1.5 times larger than the others.

Note 1:-

Drawing shows centreline corrugated bulkhead common to tween deck and lower hold spaces which divides each hold into two halves (port and stbd). The corrugated configuration of this bulkhead is vertical to the ship's keel as opposed to the more usual longitudinal. (See figures 1 and 2). As will be noted this bulkhead considerably reduces the ship's cargo carrying capability. A junior officer of the ship's company remarked that the ship "designed for war machines" (hearsay)

Note 2:-

The open hatchways depicted are in fact hatchways cut into the centreline bulkhead to allow access between the two halves of the holds. The hatchways depicted in the tween deck spaces are of the size of a very large doorway whereas the ones depicted in the lower hold spaces are of the size of a very large double doorway. These hatchways are apparently always open since there are no appurtenances around the perimeters to which a cover could be secured and there were no covers in evidence. One of the junior officers of the ship remarked that the hatchways were for ventilation.

Note 3:-

The ring bolts depicted are not shown accurately in quantity but the drawing does show their approximate position on the centreline bulkhead. These ring bolts are welded to a steel plate which in turn is welded across a depression of the corrugation (See Figure 2).

Note 4:-

These are circular plates (approx. 3 ft. in diameter) secured by bolts to the ship's side of each hold and not to the centreline bulkhead. They are included in this drawing (Fig. 3) only to depict their relative position on the ship's side of the hold (See Figure 2).







8 1/2 x 11

Figure 1

Plan view rough drawing (not to scale) upper deck level of hold of Soviet dry cargo ship NIKOLAYEV at Halifax, N.S. April, 1966. The hatch covers of hold are depicted in the closed position. Dotted line down centre depicts steel corrugated centreline bulkhead vertical to ship's keel. Corrugation configuration is also vertical to ship's keel. All of No's 2,3,4, and 5 holds had same configuration except that No. 4 hold was much larger than the others.

SHIPS  
STBD  
SIDE

HATCH  
COVERS  
IN POS'N

8 1/2 x 11

(NIKOLAYEV, March-April 1966)

SECRET  
JIB(CAN)11/66

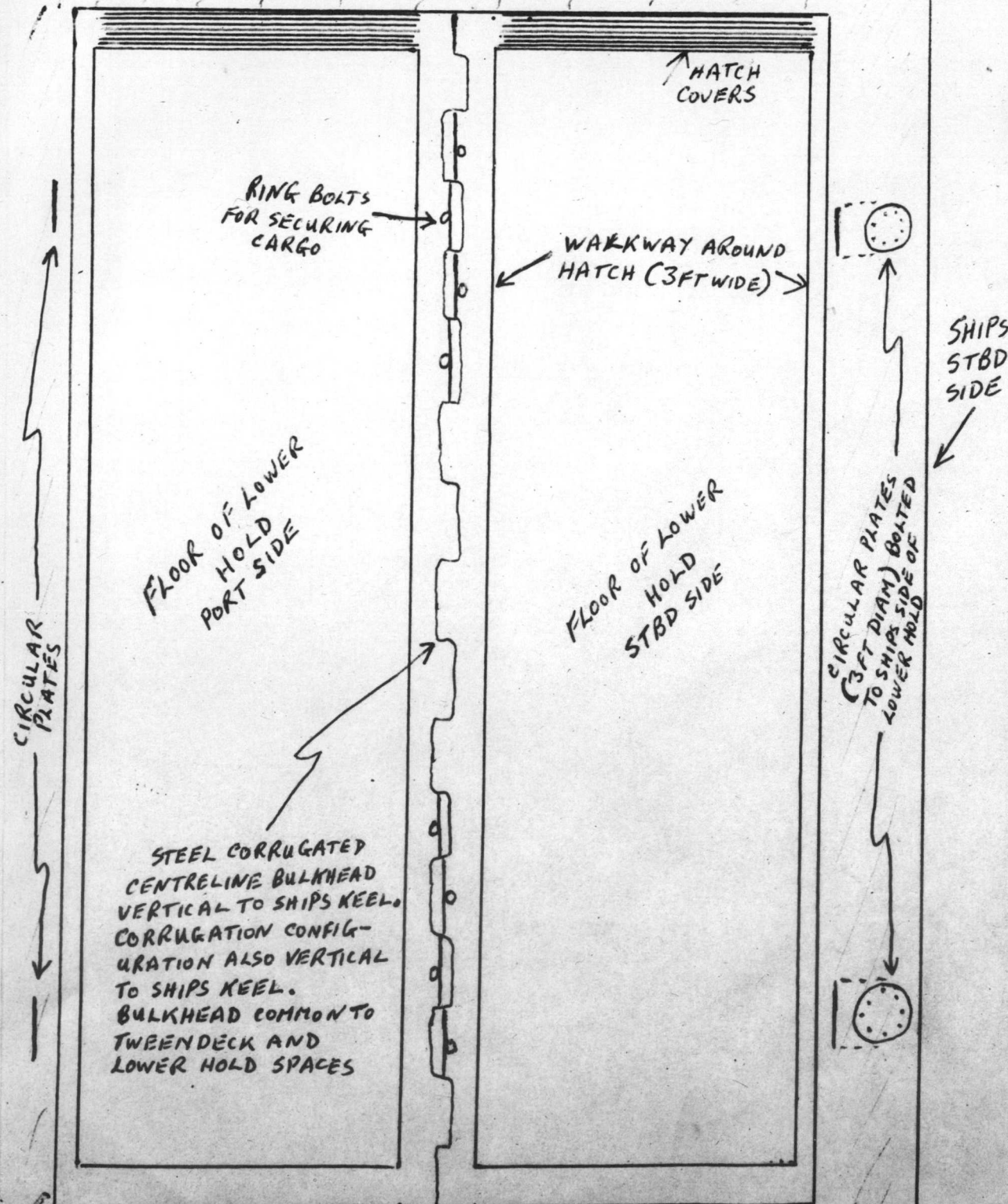


Figure 2

Plan view rough drawing (not to scale) of tweendeck level of an open hold of Soviet dry cargo ship NIKOLAYEV at Halifax, N.S. April, 1966. The tweendeck hatch covers are depicted in the open stowed position. The circular plates depicted are secured to the port and stbd. of each hold. These plates are considered to be covers for openings to allow access to wing ballast tanks since the ship's tonnage certificate (No. 29, Item 15 of photostat) states that water ballast is allowed for in tanks other than double bottom tanks to the amount of 2199.55 cubic meters, and it is believed that the wing tanks are for this purpose. However, it is quite unusual for a merchant ship to have such tanks designed into the construction of the ship. The relative position of these circular plates on the sides of the lower hold spaces can be seen in Figure 3. As can be seen from Figure 2, the centreline corrugated bulkhead divides each hold into two separate halves thereby reducing the cargo carrying capability considerably. All of Nos 2,3,4, and 5 holds had same configuration except No. 4 hold was much larger than the others.



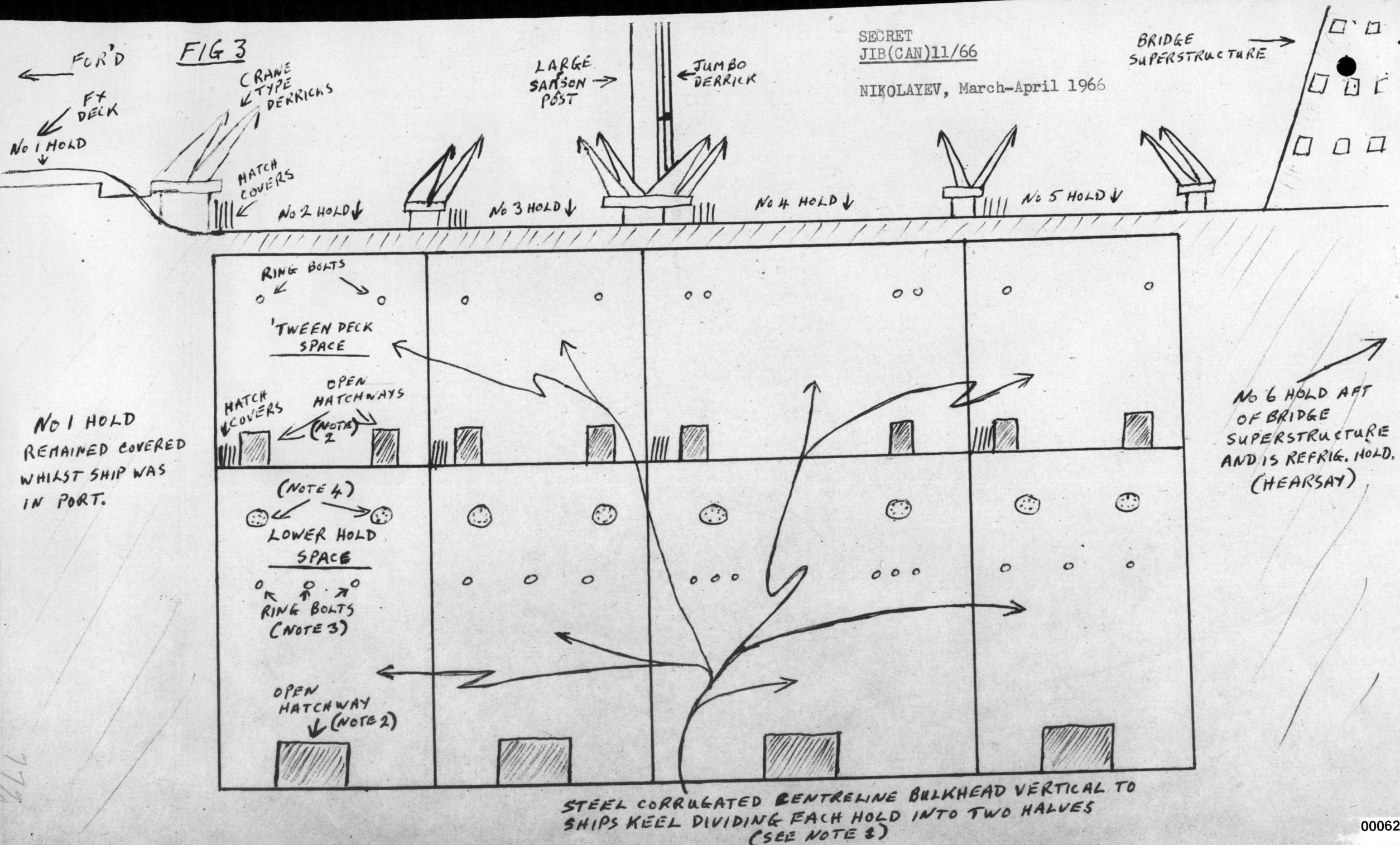
8 1/2 x 11

48

FIG 3

SECRET  
JIB(CAN)11/66

NIKOLAYEV, March-April 1966



SOVIET MERSHIP NIKOLAYEV HFX 1966 APRIL

000629



8 1/2 x 11

49

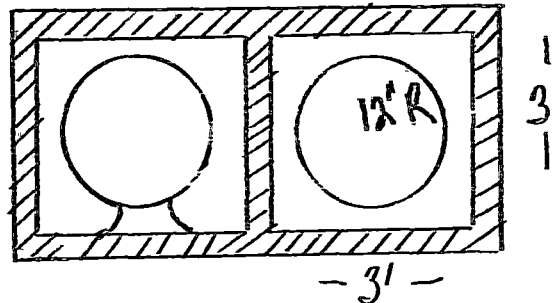
SECRET  
JIB(CAN) 11/66

VII.

USSR

CONSTRUCTION - Gas Pipeline  
Ulitsa Kirova, 2-4 March 66

1. A gas pipe line is under construction on the WEST side of Ulitsa KIROVA.
2. The installation is dual 24" (estimated) diameter steel pipe estimated 1/4 - 3/8" thick. The pipes are installed in pre-fab concrete tunnels approximately 3 ft sq. with common dividing wall. Slabs estimated 3" thick. One saddle was seen approx 6" high but details not discernible. The whole was sealed with a black bituminous substance. Pipe lengths estimated 24 ft. Back fill at this point about 4 ft.



Report & Date: M 13/66 of 10 Mar 66  
Source: CMA/Moscow

SECRET



SECRET  
JIB(CAN) 11/66

VIII.

USSR

ELECTRONICS - Palm Tree  
Ulitsa Lenina, 2-4 March 66

1. A Palm Tree installation South of Ulitsa LENINA was seen by source through a gap adjoining Dom 168. Source cannot at time of writing locate this more closely.
2. There was associated a considerable installation of caged dipoles.
3. Ulitsa LENINA is numbered from WEST to EAST with even numbers on the SOUTH side.

Report & Date: M 13/66 of 10 Mar 66  
Source: CMA/Moscow

SECRET

SECRET  
JTB(CAN) 11/66

IX

USSR

MARKINGS - Aircraft  
Vnukovo Airfield  
Baku/Bina Airfield,  
April 1966

1. At VNUKOVV Airfield, 10 April and/or 14 April, was observed  
IL-18 75887 (103006302)
2. At BAKU/BINA Airfield, 11 April and/or 12 April,  
IL-18 75858 (182005702)

Report & Date: M34/66 of 18 Apr 66  
Source: CMA/CAA Moscow

SECRET

SECRET  
JIB(CAN) 11/66

X

USSR

MARKINGS - Aircraft  
Sheremet'yevo, 29 March 66

1. Seen at Sheremet'yevo on 29 March, an AN-12 with the marking  
11376(402406).

Report & Date: N53/66 of  
5 April 1966  
Source: CNA/Moscow

SECRET

000634

SECRET  
JTB(CAN) 11/66

XI.

USSR

TOPOGRAPHICAL INTELLIGENCE  
Black Sea Area, 5-8 March 66

1. The Canadian Naval Attache, accompanied by the US Naval Attache, left Moscow 5 March for Rostov-on-Don, stopping at Sakumi, Batumi and Novorossisk and returning to Moscow 8 March 1966. The following observations were made.

SAKUMI

2. The airport had a double ONE EYE Radar and a small microwave tower; 50 small and presumably portable fuel tanks of perhaps 2-3000 gallon capacity. A one-track electrified rail line was crossed and by later observations from air would appear to be electrified to BATUMI. A trailer truck with oil drilling rods as cargo was seen. Palm Tree radio jammers were seen on the crest of the hill. A walk up and down the beach revealed no naval information. A small boat yard appears to service fishing craft and hydrofoils on the western end of the harbour.

BATUMI

3. The CAB aircraft from SAKUMI was only 1/3 full. Seen in a deserted creek, 30 minutes out from SAKUMI, were 4 P6 type hulls and a transporter. At the airport, an AA gunpark and communication centre manned by soldiers was seen. No military aircraft were seen but fighters revetments (quite old) were frequent. A merchant naval school was seen three blocks south of street on which the Intourist hotel is located (NENUSONKI?). The harbour had approximately 8000 T bulk cargo AFRICAN MONARCH unloading a brown powder substance, a Greek collier was anchored laden off the breakwater. The liner ROSSEYAH was ahead of the AFRICAN MONARCH in overhaul. Seven GANZ cranes may move up and down this jetty. Inside the breakwater was the Russian freighter KRAMORTK - no ships were in the roads. No sign of fuelling buoys were seen. Border Guard SOL 597 was at its usual mooring but its MBU's were uncovered, as was the BATUMI boat yards - no finished article was seen though. Outside this plant were stacked in the street rolled steel slabs varying from  $\frac{1}{2}$ " to 3" in thickness which were cut wherever needed. Although BATUMI has now 200,000 population it appears by-passed by other Black Sea cities more remote from Turkey. No particular new industry or expanded oil refinery facilities or extended port facilities were noticed. The large Roman Catholic gothic style cathedral is no longer functioning but seemed under repair possibly as an architectural monument. A small Russian orthodox church was visited and was crowded for its service. Although the congregation tended to be elderly, many young people and children were present.

POTI

4. On the W side of the harbour on the hill are PALM TREE radar jammers.

SECRET

(Black Sea Area, Cont'd)

SECRET  
JIB(CAN) 11/66

MERCHANT SHIPPING

5. Collier registered in JEDANOV(AZOV Sea) discharging coal. There were 2 dry docks (floating), both capable of lifting a large destroyer (one had a 4000 T approx. bulk freighter), a dredge in the inner harbour was piping its spill to reclaim land in the harbour. There were no ships at the grain elevator. The Black Sea liners berth on the south wall of the north harbour abreast the station; the road leading away goes into the town over a bridge over the former mouth of the RION river. Just before the bridge on the west side is a complicated array of radio antenna. On the East side are the offices of the Captain of the port, on which roof are the conventional harbour radio communicator aeralis. There was a strong smell of fertilizer about the docks. Also seen was a refrigerated train with a refrigerator plant on one joined to five or six either side by a corrugated hose a foot in diameter, between box cars. A walk around the outside of the naval dockyard frustrated the observer by its high fence.

SOCHI

6. Again PALM TREE radio jammers were seen on the local TV tower. Four small civilian diving tenders were seen alongside in port as well as LCU MSB's loaded with gravel. Two floating cranes with lifts of 20 T or 40 T approx. were seen being moved by tugs. Noted is the increasing prevalence of LCU MSM's throughout the Black Sea area - mostly used by civil industry some are labelled MSB1, other MSB2 and MSB3.

TUAPSE

7. On the Eastern hill crest of this port is a ring of at least 23 100' radio antenna type masts. It is thought this is an ADCOCK radio direction finding station. Further down the hill towards the town are the TV tower and Port radio station. On the western side on the hill crest is a Palm Tree jammer. Alongside the passenger pier was Border Guard SOL 27 in self overhaul. A six-cylinder engine head was being removed. A bore sight test was being carried out to its twin 25mm mount. Only an eyeshooting sight of perhaps up to 300 kts was fitted. No tachymetric fire control was provided. Others were stripping electronic chassis and some cutting out gaskets for brass pipes. In all, the ship looked in good shape but strange to say 3 LCDR's were seen in her. In the Tuapse Machinery shipyard 2 sterns flying white Russian naval ensigns were seen.

8. A walk up the Novorossisk highway to abreast the DZERZHINSKI Shipyard and up a hill of an abandoned lot provided a view of this busy merchant ship overhaul yard; 3 tankers and 4 freighters seemed in hand, also under construction appeared to be 3 tug-sized vessels. In the floating dock was a 8000 T(approx.) freighter. Moored in the harbour was a medium-sized tanker and what appeared to be 2 sled gunnery targets. Beyond the oil pier - at which a collier was unloading but inside the breakwater were seen 2 LCU MSB's on the beach. Three new possible oil tanks of large capacity have been built near where the breakwater leaves the shore; stretches of large and small pipe such as used in oil or gas transfer were seen ranged for some 400 yards along this shore either to be buried or conveyed elsewhere.

SECRET

(Black Sea Area, Cont'd)

**SECRET**  
**JIB(CAN) 11/66**

NOVOROSSISK:

9. Arrival here was after dark. Work with electric torches was proceeding on one ship in dry dock and also on what turned out to be next day the OTTO GROTHALD - last seen in Leningrad in November when commissioned. No night loadings were taking place. In the morning a walk around the harbour was made during which the observers were followed discreetly by a couple.

10. The small Border Guard Station had the following:-

SOL 88?

MO6 - no number - unarmed.

2 POLUCHAT 230,375 & 230 POLUCHAT 319 (in reserve)

2 SMALLS

SEKSTAN 152

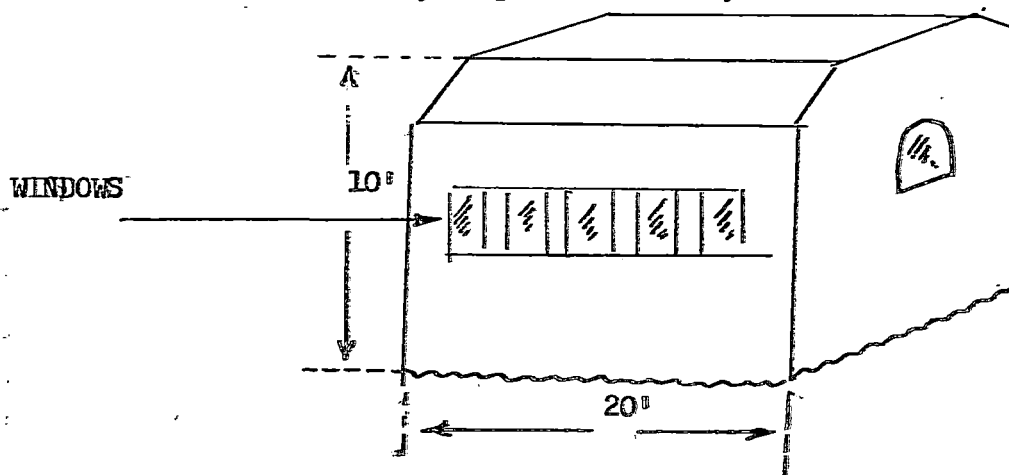
11. This harbour is a very busy one visited by ships of many nationalities. There were two very large Italian tankers at the new dock perhaps 40,000 & 60,000 tons. Further reporting on civil facilities seems pointless in the light of the many other reports. However the Cement Plant on the SE side of the harbour is enormous and large new buildings are seen newly erected on the scoured hillside.

12. A Military Bookshop (closed because of Russian Women's Day holiday) is located near the corner of MEERA and SOVETOV Streets. On the other side of the passenger jetty is some new port installation construction being built with heavy foundations. It is guarded by armed sentry. The port authority have moved two accomodation vessels alongside it to feed and house its construction gang.

13. The icebreaker NEDAKOL 2 was seen at the Sea Rescue Centre near the new oil pier was seen piled anti-torpedo nets and buoys.

14. In the centre piers were seen wooden cases, some quite old stating in English (some) Dep't of Education - JAKARTA INDONESIA, (others) Dep't of Industry & Mining - JAKARTA INDONESIA.

15. Nearby, apparently awaiting shipment, were some 40 new dump trucks of standard design, 4 khaki painted ambulances and four strange khaki coloured vehicles, whose wheels were not seen, shaped as follows;



**SECRET**

(Black Sea Area, Cont'd)

SECRET  
JIB(CAN) 11/66

18

ROSTOV-ON-DON

16. Originally a flight was asked from Novorossisk to Rostov but bent by OVS to a day train. On arrival the day train was found no longer to run. An attempt was made again to fly, but "no space". Another night train was found.

17. The train crossed a train bridge into the W part of the city. KRASNY NORVAK shipyard had a 2000 T merchant ship, a 600 T sailing (training?) ship and small boats - no new construction. An Intourist guide and tour was arranged and the following emerged: there is a new road bridge across the Don with 17m clearance at the foot of KARL MARX Prospect, the old bridge off BUDELINOVSKI Prospect is being demolished. A view was obtained of KRASNY DON shipyard and revealed only moored river boats (awaiting the opening of the Volga-Don water system). Abreast the river passenger station on the other bank was seen a hydrofoil repair and lay-up yard. The guide said only river craft were handled by the shipyards of this city. The river freezes up for only a very short time once every few years; to all intents it is an ice free port.

18. The guide also passed on these facts on Mostov. Population 700,000; 20 nationalities attend Rostov University; there was a merchant naval school (seen by source near SOVIETSKAYA 48 and ILINAYAH No.1); the main industry of the town is the grain combine plant which makes 80% of the combines in the USSR - employs 33,000 people - turns out 78,000 units a year (from the air source saw some 500 in the yards); there is a tobacco and vodka plant and a plant which makes harrows. Nearby up the Don at the old Don Cossack capital, is a factory that makes 91% of all electric locomotives (TBELISI Works in January had completed their 1000th unit). There is a factory which makes 9 million pairs of shoes a year - the guide said shoes were expensive; source noticed a woman's winter overboot fleece-lined (similar to a Clarks brand in Canada at about \$20.00 a pair) in a shop window at 62 Roubles! The guide anticipated a great increase in tourism in Rostov this summer but added cryptically he wouldn't be here but would be in India.

MISCELLANEOUS

19. (a) Agricultural No snow was seen from the air or train between Rostov, Sakumi and Novorossisk. Between Rostov and Sakumi winter wheat had greened the fields, which were left 1/3 fallow. The guide in Rostov said it had been a dry fall. The winter had not been cold but strong winds had uncovered the seed and a local poor wheat crop was anticipated. Spring in Caucasus is early, an oat crop in Sakumi was 8 inches high. The only Foot-and-Mouth precaution was taken at Novorossisk airport, but not at the station there or at Rostov or its airport. It rained 3 meters in Batumi last year.

(b) Electricity From the hotels lived in (and cooked in) Rostov, Novorossisk to Batumi all are 220 volts AC. The SS KOLGIDA was 127 volts.

(c) Hotel Bills It has been rumored that hotel rate for foreigners would go up as of 1 March. The word does not seem to have gotten out everywhere. However in Batumi the manager deeply apologized and showed source a directive from Moscow where a 4-rouble room will not cost the foreigner 14 (and it did!). The best hotel stayed in was the non-Intourist hotel in Novorossisk and one in which source saw supplied plugs for the sink and bath. It was the cleanest hotel as well.

SECRET

000638

(Black Sea Area, Cont'd)

SECRET  
JIB(CAN) 11/66

19

(d) Physics student Source sat beside a well-groomed 25 year old Russian who had tearfully said goodbye to his attractive fiancé who is attending the "College of Transport" in Rostov. He was a 5th year physics student doing "important work" at Moscow University. This summer he is to "teach" in a small village outside Moscow. He has been given the option of teaching in Africa but feels this would separate him even further from his young lady.

(e) Free Enterprise There is a glut of potatoes in the Caucasus. There is a shortage in the Crimea and in Odessa (also in Moscow) which cannot adjust itself by a present lack of a Soviet distributions system. The individual potato collectives may sell their surplus products to whoever will buy them. They have been given as a negotiable concession the right to ship their produce to Black Sea ports. A strange breed of entrepreneur has emerged as the in-between. Source talked to these men and saw them working with a ship's officer and representatives of the collectives, and the best man (financially) won. Poor tired collective farmers (who look like animals) tote these 200 lb. bags up as deck cargo. Other disappointed farmers slink away to meet the next boat. There were 300 tons of potatoes on the pier at Poti, some had been there 20 days and in pretty bad shape. Source asked a well dressed Russian what he thought. He grinned - said it was "business" (in English) then in Russian "just like the capitalists".

(f) Coming in on course approximately 250° to directly land at Venoskavah airport, Moscow, a SAM 2 site (possibly B06-2?) was seen. It was too dark to see whether missiles were fitted but vehicle tracks to each site showed it receives regular attention.

ROSTOV-ON-DON:

20. This seems to be a regional repair base for Aeroflot mainly AN10's. CRATES and COLTS. A new servicing hangar is being built. The runway is made of prefabricated octagonal concrete slabs 6 feet across and tarred in place.

Report & Dates: N37/66 of 13 March 66  
Source: CNA/Moscow

SECRET

000639



SECRET  
JIB(CAN) 11/66

XII

USSR

TOPOGRAPHICAL INTELLIGENCE

Air Trip Moscow - Baku - Tbilisi -  
10-14 April 1966

1. The Canadian Military and Air Attaches made a trip to Tbilisi and Baku 10-14 April. The following observations were made.

AIR AND ELECTRONICS

JIB SERIAL

OBSERVATIONS

VNUKOVO Airfield - The following were  
observed 10 Apr and/or 14 Apr:

TU 104 - 42332, 480, 490, 409, 481, 489,  
433, 410

TU 124 - 45027

AN 10 - 11221, 011, 214, 175, 203

BAKU/BINA Airfield - The following were  
observed 11 Apr and/or 12 Apr:

4 FORK REST near entrance to terminal co-  
located with 6 X 40' masts suspending  
CAGED DIPOLES.

1 BAR LOCK rotating 3 rev/min

2 ONE EYE

On control tower on terminal - 10 DISCONES,  
1 MERCURY GRASS, 1 prob DRY RACK

BAKU Antenna Farm - located near stadium  
consisting of:

1 PALM TREE

2 steel lattice towers approx 200'

35-40 pole masts ranging in height from  
30' - 50' many supporting caged dipoles  
with separators of assorted shapes

SECRET

(Moscow - Baku - Tbilisi Trip  
Cont'd)

SECRET  
JIB(CAN) 11/66

JIB SERIAL

A 18

A 13

OBSERVATIONS

TBILISI/VAZIANI Airfield - was observed briefly on flight Baku - Tbilisi 12 Apr, almost directly below from aircraft shortly before turning N for landing at Tbilisi/Civil. Impression gained that there were aircraft on virtually all hardstanding. Aircraft included Pagot/Frescoes and possible Fitters on hardstandings on NE section of taxi track. No Fishbed-Fishpot were noted on ground during brief sighting but four overhead sightings of this type of aircraft (and of one possible Fitter) were made from the streets of Tbilisi during the next two days.

TBILISI/CIVIL Airfield - The following were observed 12 Apr and/or 14 Apr:

Several Hare/Hound, Coach/Crate, Cab

IL 18 - 75779, 606

TU 104- 42500, 420, 410, 455, 503 (hours to Moscow)

TU 124- 45062

1 BARLOCK with STONE/SPONGE CAKE

1 ONE EYE

1 BARLOCK STRIKEOUT and probable DRY RACK outside gate on embankment near road.

2 KNIFE REST near junction with road to Tbilisi

1 FORKREST co-located with a group of 8-10 military trucks on the airfield side of road to town shortly after leaving junction.

SECRET

(Moscow - Baku - Tbilisi Trip  
Cont'd)

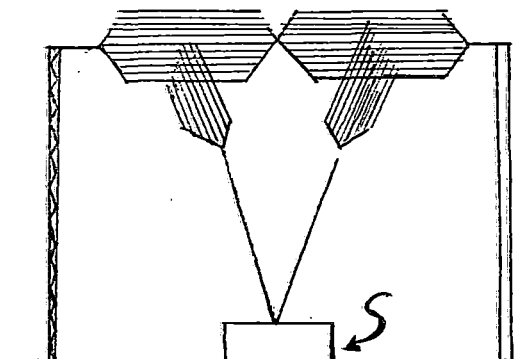
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JIB(CAN) 11/66

JIB SERIAL

194

OBSERVATIONS

TBILISI Radio Station - Extensive area contained: two 100' wooden lattice towers; 2 pairs of 150' pole masts supporting caged dipoles; two 200' steel lattice masts about 300' apart supporting an array roughly as shown below



and a 6-pair Rhomboid with masts approx 50' in height, oriented EAST - WEST

OBSERVATIONS IN BAKU

11 - 12 APR 66

GENERAL

2. According to our Intourist driver, the current population of BAKU is 1,200,000. A great deal of apartment house construction has been done and much more is in progress. Some apartment blocks in the new city are quite attractive and of a higher standard of design and construction than normally encountered. The old city is falling into disrepair with no significant attempt to maintain any part of it except for selected old mosques and a few other buildings/installations of historical interest.

3. A metro serving three stations will be brought into operation this year. Other stations are to be added. No brochure could be found.

(Moscow - Baku - Tbilisi Trip  
Cont'd)

SECRET  
JIB(CAN) 11/66

23

JIB SERIAL

OBSERVATIONS

In the course of our Intourist tour travellers observed three bands preparing for a practice/rehearsal on Lenin Square. They had not fallen in and a count was difficult. There was a fife and drum band, in summer field uniform, estimated 80 strong, and two brass bands in parade uniforms each estimated 40 - 60 strong. There were no other troops and no equipment. The driver agreed that they were practicing for the 1 May Parade. He also agreed that Baku has a large parade with many troops and much equipment.

175?

Near the North entrance to Kirov Park on the SW side of Oulitma NARIMANOVA is a military area with approximately 1000 foot frontage and with the approximate layout indicated by the sketch 1. The fronts of the two main buildings are a continuation of the fence which is patterned masonry permitting some visibility.

Opposite BAKU/BINA Airfield on the EAST side of NARIMANOVA is a typical board fence which at one time probably surrounded a military or quasi-military installation. However, any buildings that existed have been raised probably to make way for new construction.

158

Adjoining BAKU antenna farm above is the Russian Cemetary which looks more like a park than a cemetery. A block further along on the left, but not fronting on NARIMANOVA, is another military area conforming generally to the following layout (see sketch 2) In this general area were seen 1 Col MR, 1 Col SAF, 1 Col Med, one Lt-Col SAF, 2 U/I Lt-Cols, 1 Capt Arty blk, two U/I Cpts/Lts

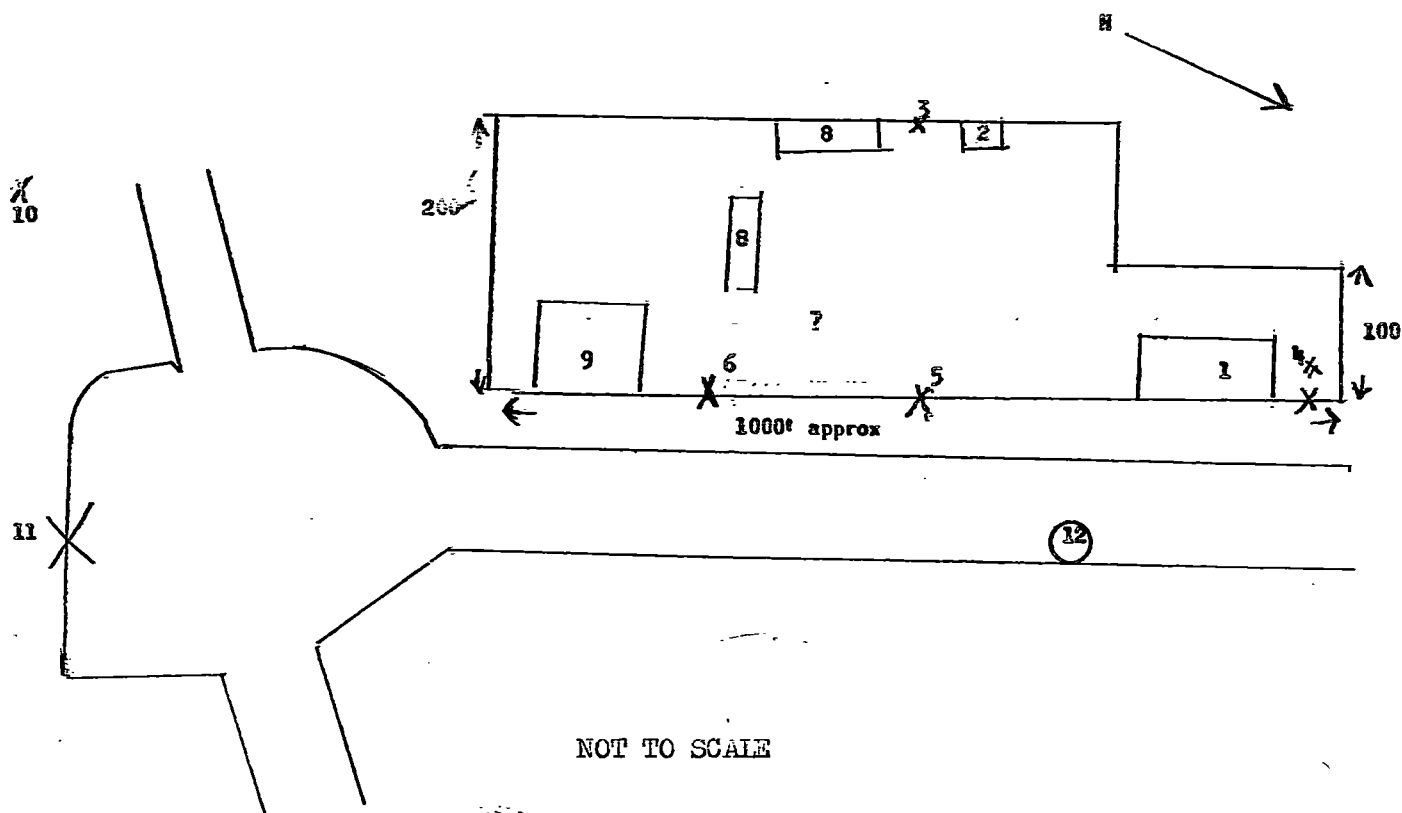
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000643

(Moscow - Baku - Tbilisi Trip  
Cont'd)

SECRET  
JIB(CAN) 11/66

SKETCH 1



- NOT TO SCALE
1. New five storey building estimated 120' X 40'.  
The lower row of windows is barred. A U/I officer and a nval rating, who appeared to be a courier, were seen to enter.
  2. Gate house
  3. Manned gate
  - 4,5,6. Locked, unmanned gates
  7. Apparent underground storage. This area has several cone shaped ventilators standing about 4 ft above ground and partially obscured by shrubs.

(Continued)

SECRET

(Moscow - Baku - Tbilisi Trip  
Cont'd)

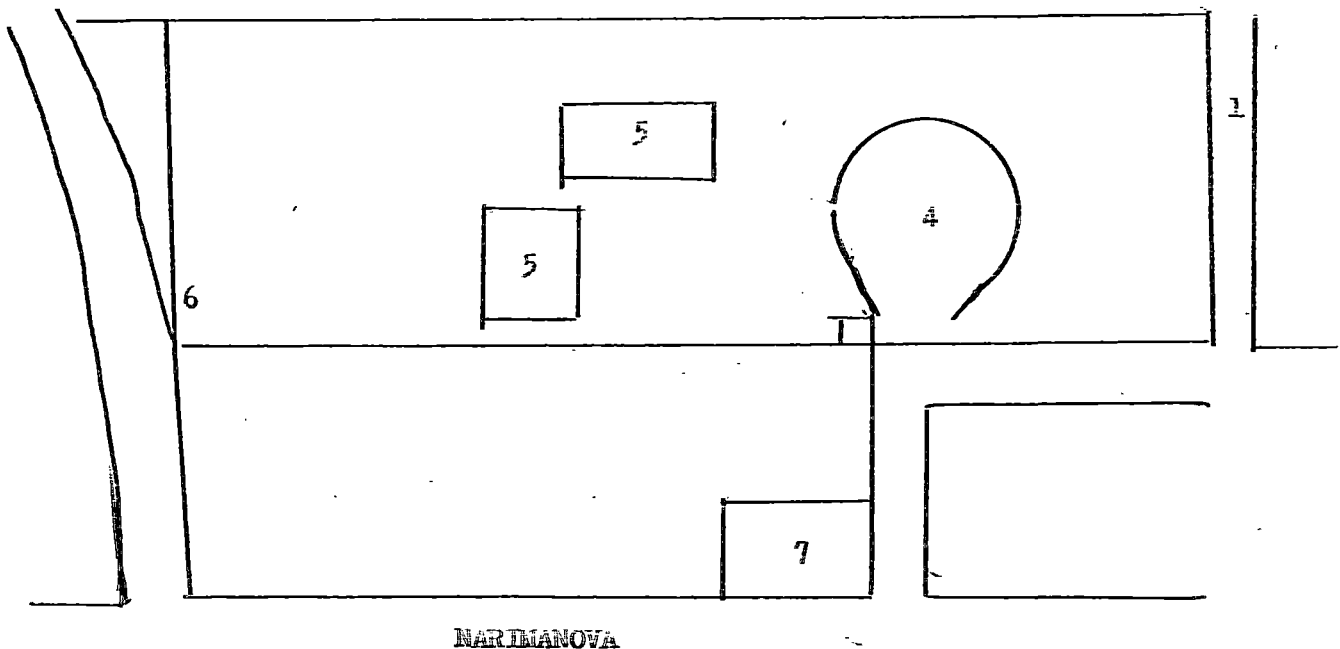
SECRET  
JIB(CAN) 11/66

(Sketch 1 Continued)

8. Old, low buildings.
9. Old, stone, apparently HQ building. One u/i Lt-Col was seen leaving the building.
10. T.V. tower.
11. Entrance to Kirov Park.
- (12) A U/I officer (green) was collected here by a jeep bearing number 27-32 00

SKETCH 2

Not to scale



1. North Gate
2. Main ? Gate with gatehouse (3) manned by female in uniform. A jeep with No 0102Ab bearing two U/I officers and a driver entered as travellers approached.

(Continued)

SECRET

(Moscow - Baku - Tbilisi Trip  
Cont'd)

SECRET  
JIB(CAN) 11/66

JIB SERIAL

OBSERVATIONS

4. A paved courtyard surrounded by a number of low buildings.
5. Two storey barrack type buildings.
6. SOUTH Gate. A squad of troops in summer field uniforms left by this gate as travellers approached.
7. Stolovaya. Several uniformed personnel were seen at tables through the windows.

Behind (WEST of) the academy of Science on high ground is a stone-walled compound with a number of low pink buildings. The compound has a military appearance but no military personnel were seen. A distant view through a gate in the SOUTH wall disclosed a truck under canvas. The compound is roughly 400 feet by 200 feet.

In the area in front of the entrance to Kirov Park (Serial 3) were seen four trucks. VRNs in the 86 - K series. They were being used to train student drivers. A Kursant was seen at the wheel of one of them.

112

On the way to the airport at the end of Prospect Stalina a probable oxy-acetylene plant. A brief glimpse through the open gate disclosed approximately fifty steel gas cylinders standing on end. No colour code was observed.

The observers general impression of Baku is one of a relatively small military population. Few military personnel were seen in the streets except near military installations and the proportion of military to civilian vehicles was very low.

SECRET

(Moscow - Baku - Tbilisi Trip  
Cont'd)

SECRET  
JIB(CAN) 11/66

OBSERVATIONS IN TBILISI

13 - 14 APR 66

GENERAL

4. Travellers spent first morning touring the city in an Intourist car including a visit to the Funicular restaurant. From this view point, a parade rehearsal was seen to be in progress near Metakh Most, and travellers succeeded in arriving at the scene in time to observe. In the afternoon source walked EAST on Shaumyana to Navtlugskaya then along 5 Dekabraya and Bogdan Khmalnitskovo. The following morning source returned to the EAST end of Bogdan Khmalnitskovo. Source caught a repeat parade rehearsal near Metakh Most.

JIB  
SERIAL

89

OBSERVATIONS

From the promenade in front of the Funicular restaurant looking almost directly EAST across the river and against the mountain is a large military park.

Parade Rehearsal (Esplanade EAST of METEKH MOST)

- a. Exercising were a fife and drum band 80 - 100 strong in summer field uniforms, two brass bands approximately 60 strong, and twelve fanfare trumpets. The personnel of the brass bands were in parade uniform and magenta, black, and blue were observed. Distance precluded further identification. After the parade rehearsal on 14 Apr, source saw all the vehicles involved proceed N on Navtlugskaya then E on Shaumyana.
- b. Equipment consisted of BRDMs and BTR 60P. The parade of equipment was led by a GAZ 69 followed by a BRT 60P. This was followed by three groups of 7 BRDMs in the order 1-3-3. And this followed by three groups of 9 BTR 60P in threes each preceded by a BRDM. The BTR 60Ps had a Red Star on the hull near the front with, above, a number between 141 and 195.

SECRET

000647



(Moscow - Baku - Tbilisi Trip  
Cont'd)

SECRET  
JIB(CAN) 11/66

JIB  
SERIAL

151

OBSERVATIONS

In the course of the Intourist tour travellers saw two probable 122 mm gun/how under canvas in convoy. The weapons were noted to have short tubes and long trails. They were proceeding SOUTH on Khetagurova between K Marksa and Bagatashuili Mosts.

Approximately 400 yds EAST on Sheumyana a military compound with a frontage of almost 200 ft. Three soldiers in summer field uniforms carrying carbines left the main building as travellers approached and drove away in a GAZ 69 bearing VRN 0085HK. The main gate was closed. On the return journey a squad of approximately twenty troops also in field summer uniforms was being marched off on a bath parade by an NCO.

A three storey building directly across the street from serial A 18 appears to be associated with it.

Approximately two hundred yards past A 18 and on the same side is a small MT compound. Four soldiers, and two vehs with VRNS in the 42 - Eφ series were seen through the partially open gate.

SOUTH of the corner of Shaumyana and Navtlugskaya a shabby red building, does not appear to have a military association.

Approximately 250 yds SOUTH on Navtlugskaya, on the EAST side and extending for approximately 400 yds a considerable compound behind a 10 - 12 ft solid masonry fence. The tops of five large one and two storey masonry buildings could be seen over the fence but no indication of function could be observed. Near the SOUTHERN end and barely visible through the trees is a tall building with stone columns. There is a gate at the NORTHERN end of the complex and one at the SOUTHERN end offset from the street. About a dozen troops were seen entering or leaving but in no instance near enough for identification. The installation gives the impression of having been there for a long time but does not have a particularly operational appearance.

SECRET

000648

(Moscow - Baku - Tbilisi Trip  
Cont'd)

SECRET  
JIB(CAN) 11/66

JIB  
SERIAL

174c

OBSERVATION

Starting at No 44 Pyatyy Dekabraya and extending for approximately 1500 feet is another military complex. It has a solid masonry wall between the fronts of low buildings and has four gates fairly evenly spaced along this boundary. Where building fronts form part of the wall the windows are barred and screened. A long low building at the WEST end is probably a barracks. One partially opened window disclosed the end of a made-up cot. A partially opened gate near the center gave a partial view of a cargo vehicle, and one U/I soldier, in a small paved courtyard. At the visible corner was a stack of broken unpainted crates - lumber still fresh. Two two-storied buildings near the Eastern end had barred upper windows. As for military there was no visible activity. One Capt MR and six soldiers MR were seen to leave the complex and were caught up with at a bus stop. Two probable signals soldiers carrying climbing spurs were also seen in the vicinity.

Report & Date: IR M-34/66 of  
18 April 1966.

Source: MA & AA/Moscow

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JIB(CAN) 11/66

XIII

USSR

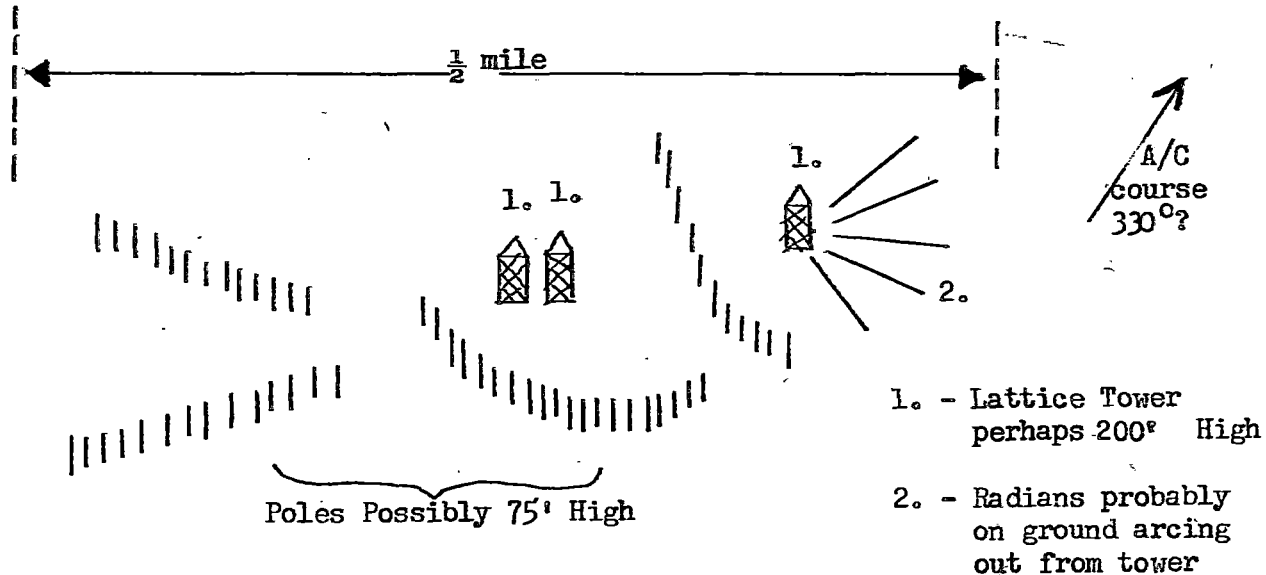
TOPOGRAPHICAL INTELLIGENCE

Leningrad, Tallinn, 29 March - 1 Apr 66

1. The Canadian Naval Attache and two Australian Naval Attaches made a trip by air and train, MOSCOW/LENINGRAD/TALLINN/MOSCOW, 29-31 March 1966. The following observations were made.

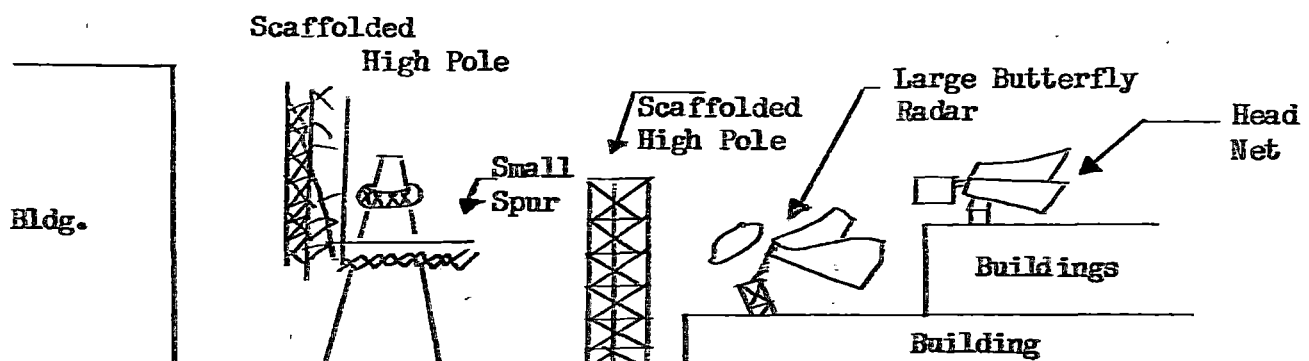
FLIGHT--MOSCOW-LENINGRAD

2. The take-off from (Sheremet'yevo) Moscow 29 March was at 0911 hours on IL-18 plane. At 0918 crossed the canal and observers saw SAM I Site. Sighted possible E27-1 at 0925, an array of antenna as sketched below were seen. Other SAM Sites were seen on other side of the aircraft (to be reported by another source).



ZDHANOV

3. The contents of Zdhanov are most speculative. Source saw from KONSOMOL PLOSHAD:



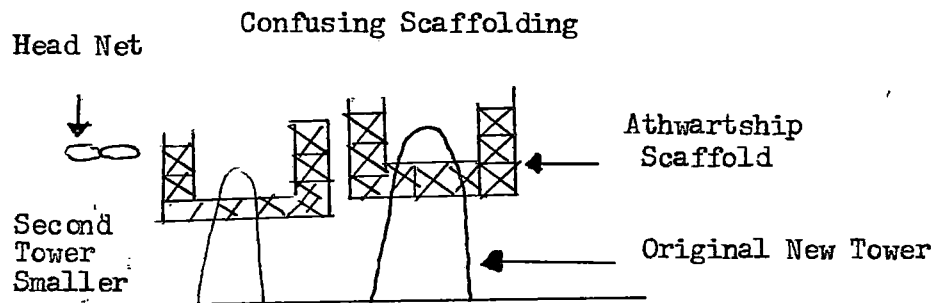
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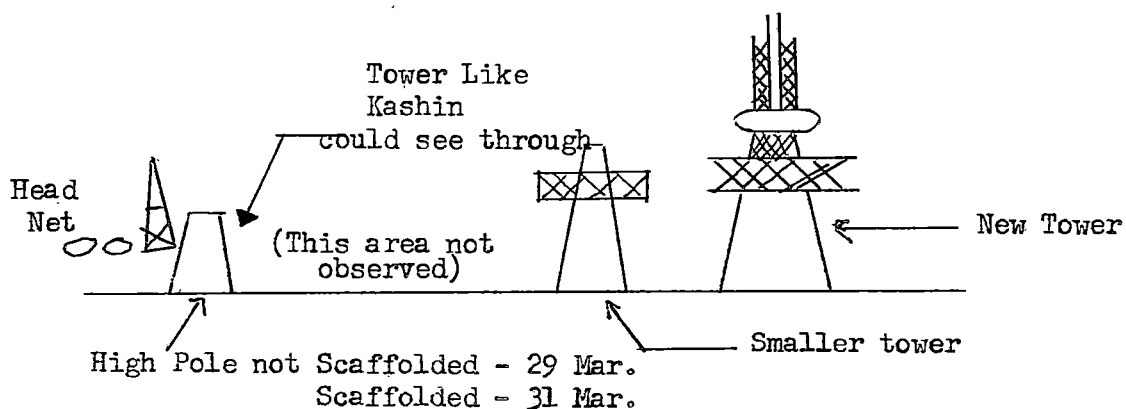
(Leningrad, Tallin, Cont'd)

SECRET  
JIB(CAN) 11/66

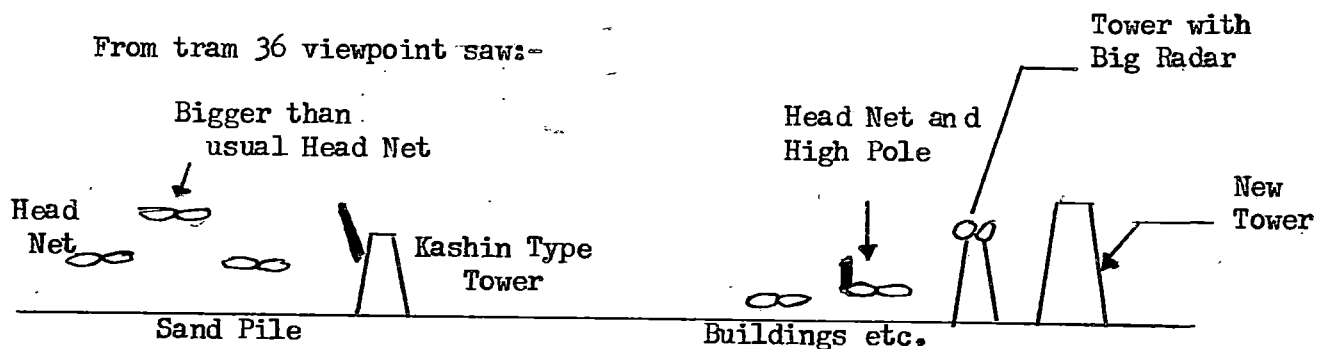
(b) From 35 tram, looking NW



(c) From tram 35, looking north



(d) From tram 36 viewpoint saw:-



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000651

(Leningrad, Tallin, Cont'd)

SECRET  
JTB(CAN) 11/66

4. Continued observation will be the only means of identifying the contents of this basin. It may well be the new class of ship has two towers, and that a new type of radar is being fitted to it and perhaps the newer KASHINS. It appears these are a new construction, two KASHINS and perhaps a KYNDA present.

5. Pos 64S - There is a new centre section about 40 feet long fitted on a keelson which stretches some 150 feet. What may be the transom appears like that of a SKORY class specification. Numerous other prefabricated sections seem to be awaiting affixation to the hull.

SUDOMEKHA-(NEVA)

6. Pos 25 - Whiskey '080 and some assortment of auxiliary including tug )OB52. Submarine appeared being prepared for departure.

Pos 27 - Floating workshop.

28 - Usual Skinhead vessel - Two door shed is now glassed in and should be called "three door shed". Small workshop on left side emitted a noisy blue flame 10 feet high twice - perhaps oxygen flame.

29 - Permanent screen.

30 - Drydock returned. 29 Mar. - new construction, red oxide observed 31 Mar. - F Class sail on inboard side and outboard position - probably another F. At end of drydock on wall extending to approx. 10 ft. from corner was the end of the large cylinder reported in BNA Rus 500/438/66 of 15 Mar./66. A supply of submarine crown plate were seen on the jetty.

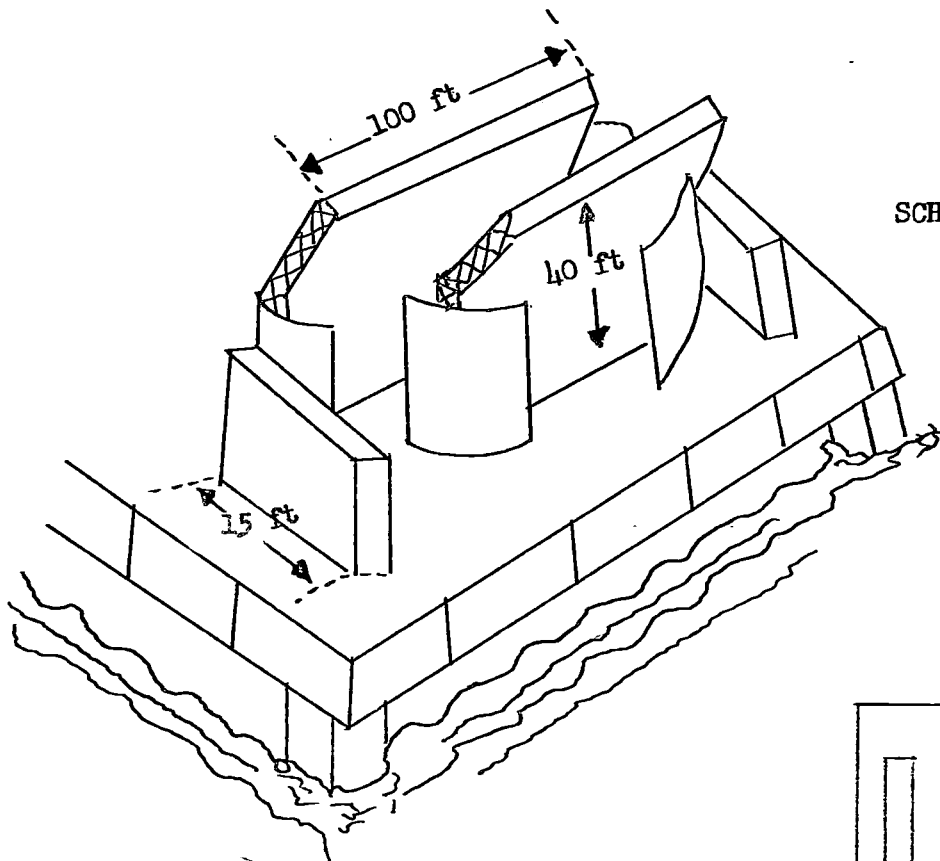
31 - A strange floating structure is being assembled which on first glance appears a floating drydock or transporter.

(For diagram see following page.)

SECRET

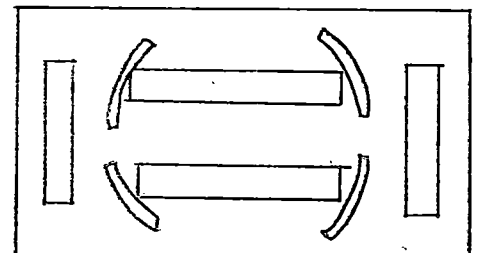
(Leningrad, Tallin, Cont'd)

SECRET  
JIB(CAN) 11/66



SCHEMATIC VIEW

TOP VIEW



SECRET

(Leningrad, Tallinn, Cont'd)

SECRET  
JIB(CAN) 11/66

34

Pos 32 - (Behind screens) 2 Submarines, both red oxide - outboard showed W/T whip, STOPLIGHT and SNOOP TRAY - Adjudged Foxtrot. Inboard seemed to have slightly different stern assembly - possibly earlier stage of construction.

Pos 33 - Two brown hulls. The one, 935, which looks like an accomodation vessel had many workmen working.

Pos 34 - Foxtrot 554 outboard of NOVOSIBIRSK.

Pos 44 - New tanker "GEORGE GEORGIU-DESA". Leningrad Pravda of 29 March showed this ship "before launching" on railway type launching platform. Single screw, 5 blades, copy of article being forwarded elsewhere.

Pos 13 - Large new mership RICARDO SORGE

Pos 8,9,10 - Nothing observed from 35 bus

Pos 0-6 - Restaurant vessel, dredges, inland water ships(3 - 800T), passenger ship POPOV, 2 sail training ship - DOSTAFF submarine

Petrovsky:-

7. An enquiry at the marine passenger station on the Malay - Neva reveals regular boat service will commence for Kronstad and Petrodvorets on the 23 May. On 31 March the channel was still frozen. At the end of Uralskaya through a factory gate was seen the mast of a new VANYA. Another gap showed across the river in the Patrol craft base - a canvas covered OSA or KOMAR - at OSTROV DEKABRISTOV park on high mound of melting snow gave a partial view of this base and showed an OSA in pos 79A and 74. The level of work in these shipyards seemed minimal judging from the lack of noise.

8. Five Madges were seen at the Seaplane base including 36(MAD boom fitted) one 07. No new radar was seen at the submarine school. The liner ALEXIS PUSHKIN was seen at Levaya quay C.

9. The entrance to SUDOMEKH yard is opposite KRASNAYA Ulitza. Two doors short of this is the geographical faculty of the University of Leningrad, formerly the planetarium of this college. From here can be seen a number of new presumably heating steam pipes going into the newly altered two door shed.

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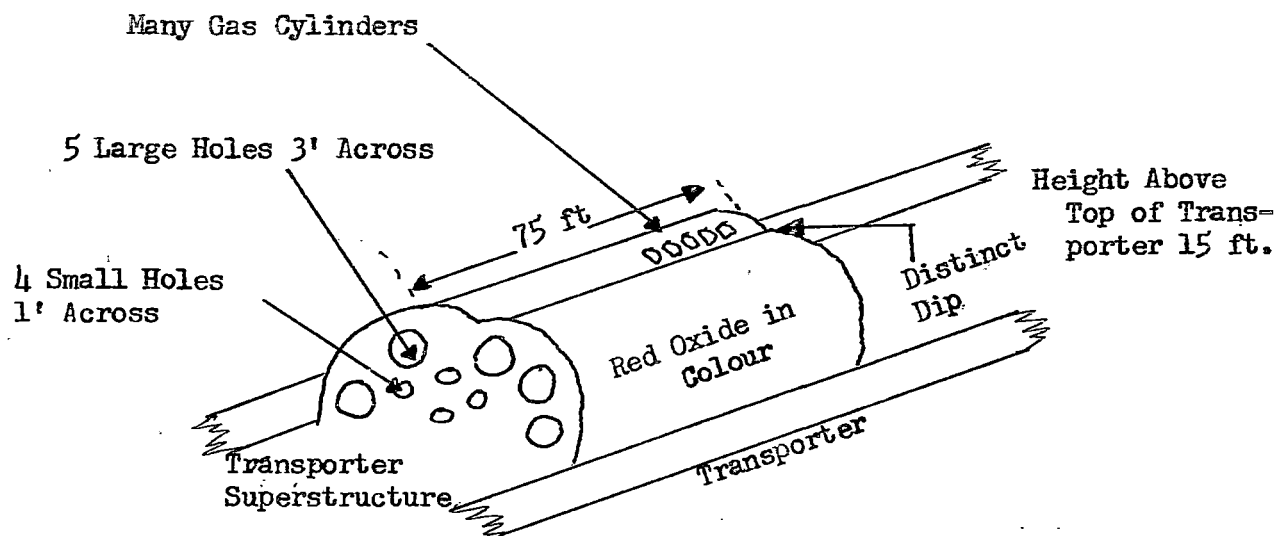
(Leningrad, Tallinn, Cont'd)

SECRET  
JIB(CAN) 11/66

35

Tallinn(30 March)

10. Beckers:-Hoisted dry on end of mole - PCHELA 333  
Inside mole:- 8 SOL's including 166 & 281  
AC PTR 31  
1 VANYA  
1 KRONSTAD  
2 OSA with drum tilt  
2 P6 and 1 P4 549(all three on land - in reserve)  
2 Sterns of SHERSHEN like vessels with German  
Naval ensign.  
1 Large transporter with 75 foot section; it  
looked as follows:-



11. A glance through a fence indicates the Baltic Yard is either overhauling or constructing medium size merchant ships. The yard includes a fairly large saw mill. The Polytechnic has teenage students. Microscopes and scales were seen in the windows. The cupola had a mast with an assortment of coloured lights and a VHF aerial and wind anemometer were seen fitted on the roof. At Beckers across the harbour from presumably VYANA airfield could be heard the noises of aircraft jet engines being tested. A helicopter could be seen hovering. There was a small radio antenna farm on the skyline in the direction of the airfield.

12. The new harbour revealed:  
5 - Kronstad  
3 - T43 including CKS 12  
3 - Yurka (2 with drum tilt)  
1 - Q class on marine slipway - believed same sighted last-year  
1 - T 301  
1 - Vanya 148  
2 - Tenders(one on ATREK)  
The repair yard on the north side of this harbour as seen from the cemetery has a new large gantry under which seemed piled new lumber.

SECRET

000655



(Leningrad, Tallinn, Cont'd)

SECRET  
JIB(CAN) 11/66

13. The Old Harbour had:
- 1 - Chapaev 105(in commission)
  - 4 - Riga(only 628 in commission)
  - 3 - Skory(in reserve)
  - 2 - T 43(one in commission)
  - 1 - OSA 385
  - 1 - Med. ice-breaker
  - 1 - Tug PR 20
  - 1 - AD 6
- Civilian diving ship SIBERAKOV.

14. At the terminus of # 1 bus in about 59° 29'N 24° 52'E were seen 22 poles 75 feet high in a circular pattern linked by wires. It is suggested this is a type of ADCOCK or KRUG. An ice-breaker was seen escorting a LCU F4 through an ice channel. Later on a tug was seen towing a passenger freighter of about 10,000 T through same channel. The moth-balled Skorys no longer seemed fitted with dessicating pipes to directors and external fixtures. The sail training ship VEGA was moored alongside the passenger terminal in the old harbour - the terminus was closed. Narrow gauge rail tracks still in use were seen in outskirts of the city. An attempt to visit the air-fields was thought better of when about 3 K outside the city source observed he was followed by tails. On this Leningrad Highway was seen a refrigerator plant and a large vehicle repair centre.

Miscellaneous:-

15. The city of Tallinn has a population of 600,000, now 50% Russian. At K260 of rail Leningrad-Tallinn, on west side, was seen a probable air defence station consisting of 4 Knife Rest, a simple sort of Knife Rest, and on 75-foot towers, a radar similar to a STONECAKE and the other similar to a CROSS CUT. The rail track between Leningrad & Tallinn is not electrified. At K264 west side was seen a Palm Tree. These jammers are also mounted on the TV transmitter in Tallinn.

16. An old Estonian gentleman of 73, was met who had fought in the Czarist and Estonian forces and for a while worked in England. Because he merits no pension he still works and would appear to be the Director of the SHALE oil fuelled electrical generator at Narva(6 large smokestacks) and according to him generates 1,600,000 kilowatts. Another similar plant is to be built. This man has his own house, car & 200 fruit trees; his daughter is a surgeon and his son an engineer. He does not like the Russians and complained of the rape of the Estonian people. He says there is no turning back now. He eagerly accepted Source's Western newspaper. A woman of 65, was met who looked after 3 homes and receives 45 roubles a month pay. She owns her own cow. There is a Foot & Mouth disease within 30K of Leningrad and, according to her, none in Estonia.

17. A new badge was seen on the breast of a major of the Transportation Corps. It was winged gold blue and silver 3" X 2" and had the number "2" on it. Similar badges have been seen elsewhere with "1" and "3". It is thought to indicate proficiency in rockets in the Rocket Forces (see US I.R. 5 901 0032 66 of 15 Mar.65)

SECRET

(Leningrad, Tallinn, Cont'd)

SECRET  
JIB(CAN) 11/66

18. The bookstore of the foreign Socialistic Republics opposite the Europa Hotel in Leningrad was visited. It had books from every Iron Curtain country save China. The administrator said the only Chinese book they had ever had was one printed in English on Logic about a year ago. She could not explain why there are no chinese books.

19. A Jewish taxi driver was encountered who admitted their race was receiving a hard time in Russia but pointed out they also did in America. He had no optimism for the outcome of the 23rd conference. It was noted that the keynote speech of this conference came in for the first time on the train to Tallinn. Nobody in the train seemed to be listening or to care.

20. En route back to Moscow by rail, in KLIN in the light of dawn, 10 aircraft were seen at the airfield and one dome of the suspected anti-ICBM site. Lack of light precluded better observation. Travellers between now and mid-Summer's Day would do well to keep this in mind when passing.

CNA/Moscow  
N53/66 of 5 April 66

SECRET

SECRET  
JIB(CAN) 11/66

XIV

USSR

TOPOGRAPHICAL INTELLIGENCE  
Petrozavodsk, 5 May 1966

1. Source made a train trip to PETROZAVODSK, on 5 May 1966. The train left the Moskovsky station in Leningrad at 9:10 a.m., and the six-hour trip was uneventful. Patches of snow which began to appear about half-way in the trip broadened almost to snow-cover at the destination; and two rivers (evidently the Volkhov and the Pasha) were open and running at full spring tilt but Lake Onega remained frozen.
2. Because of awkward train schedules (trains from Murmansk to Leningrad pass through Petrozavodsk daily at 3:41 a.m. and 4:23 a.m. respectively; a locally made-up train departs for Leningrad at 11:30 p.m.), Source was in Petrozavodsk for nine hours only. This was enough for a broad, if superficial, look at the town but not for interviews which might have deepened impressions.
3. Petrozavodsk, the capital of the Karelian ASSR and the seat of government and centralized activity for a large area along the Finnish border, is a city of between 160,000 and 170,000 persons. It is set on the sloping shores of Lake Onega, and on arrival at the railroad station and through a tour of the city it gives the impression of a "northern" town, with an atmosphere remotely similar to Canadian frontier settlements. However, as Source's guide was quick to explain, it is not a new town but had been founded at the same time as Leningrad. Source had the impression that summer greenery would give it a less barren appearance but at the bleak "end of winter" it was not inviting.
4. It is low in silhouette, with no buildings above six stories and few above three or four. Many of the buildings along the main street, Prospect Lenina, which runs from the railway station down to the lake, are evidently occupied by Ministries and agencies; a substantial building, formerly occupied by the now-defunct Sovnarkhoz, was pointed out. There is a university with eight faculties and some 6000 students. A medical faculty was added last year, with about 150 students so far, and further buildings and facilities are being constructed. It is evidently intended to concentrate the university at the lower (lake) end of Lenin Prospect.
5. The contrast in living accommodations was rather interesting. Many older dwellings still remain in the city (i.e., just off the main streets as well as farther out); these are generally run-down and in need of paint, although there are some pleasant exceptions. All new housing construction is, in typically Soviet style, of six-storey apartment blocks. Source was told that construction of private dwellings was not allowed within the city, but an area along the lake north of the city is evidently open (on what terms was not specified) for summer dachas with small plots. The idea of "satellite" towns is being developed. Source was shown two areas where groups of apartment buildings were being constructed, each with total accommodation for 25,000 north of the centre of the city. The city's total population is expected to be 250,000 by 1970.

SECRET

000658

(Petrozavodsk, 5 May  
cont'd)

SECRET  
JTB(CAN) 11/66

6. Although Petrozavodsk is the capital of an "autonomous" republic "national" qualities are not quickly evident. A few store signs are written in both Russian and Finnish, but unlike those in the Caucasian Republics, the street signs are not. Source was told that, of the people in the Karelian ASSR, about fifty thousand know Finnish, and in the city itself about ten percent speak it. The guide, himself of Finnish extraction, made no attempt to persuade Source one way or the other on the national or language problem, but his wife's brief comments at the Finnish Theatre that evening were of some interest. There is a "Russian" theatre on Kirov Square in a smaller-scale version of the traditional heavy Russian style and evidently doing a standard repertory of opera and drama. The "Finnish" Theatre (officially the State Finnish Dramatic Theatre of the Karelian ASSR) is across the square, a small and apparently much older building which has been refurbished fairly recently; the puppet theatre adjoins it and shares some facilities. In the Finnish Theatre the decoration is modern, Scandinavian influenced, and an air of lightness prevails. It was in this context that the guide's wife's remarks were interesting - she contrasted the works done by the two theatres and the style of operation, describing the Finnish Theatre's work as "modern" and leaving Source to conclude what the work of the Russian Theatre was like.

7. The major industries in Petrozavodsk, apart from the railway and the work related to forestry in the surrounding area, appeared to be the Onegzhka Tractor works and a large new plant for the production of paper-mill machinery. The tractor factory is a large sprawling enterprise just to the south of the main streets. There appeared to be no significant new construction and the whole impressed Source as having a rather old appearance. The new paper-machinery plant lies on the northern outskirts, but the guide's suggestion that Source have a closer look at it was firmly and successfully resisted by the taxi driver, who presumably knew what he was doing. In a sense, the important railway to the northern ice-free port of Murmansk continues to dominate the city's life. There are whole quarters inhabited by railway workers, and their "Culture Palace" is one of the more imposing edifices in the city (Source felt, though, that "this does not say much").

8. Shipping is another important activity in Petrozavodsk in season. With the lake frozen, nothing was going on while Source was there; the only large ships evident were the tourist steamers which, he was told, travel through the inland waterway to the Black Sea during the summer. He heard that an icebreaker was pushing its way to Petrozavodsk from the south but was still some 70 Km away.

9. A related point of interest is the decision, which became effective last summer, to open the island of Kizhi in Lake Onega to tourist traffic. Some two and a half hours from Petrozavodsk by motorboat, this island with its magnificent wooden churches and other buildings, will draw an increasing number of tourists (presumably the reason for sprucing-up of the Intourist hotel).

SECRET

000659

(Petrozavodsk, 5 May  
cont'd)

SECRET  
JTB(CAN) 11/66

10. Nothing of military or naval interest was seen, during this visit to Petrozavodsk.

Date: May 10, 1966  
Source: Reliable Canadian

SECRET

SECRET  
JIB(CAN) 11/66

XV.

USSR

SHIPPING - Merships

Soviet Passenger Liner ALEXANDR PUSHKIN,  
Montreal, 27-30 April 1966

1. The Soviet Passenger liner ALEXANDR PUSHKIN (callsign not known) (Official No. 01062) arrived in Montreal 1240Z, on 27 April 1966 and departed 1500Z, on 30 April 1966.

Passengers Westward

2. The vessel disembarked 38 passengers at Montreal, P.Q., of which 17 were newspaper reporters, etc., covering the voyage. The number of passengers carried on her maiden trip can only be described as most unusual as it is normal to expect such a voyage to be booked to capacity.

Passengers Eastward

3. The passenger list on her eastward leg of the journey appeared a little more impressive, with 214 embarking at Montreal, P.Q., but still far below her full passenger capacity of some 600.

Service

4. The steward service was described by reliable sources to be slow and below the standards set by Western owned and operated liners.

Food

5. Although the menus were said to be attractively printed, the food was not as tasty and well prepared as one would expect. This would indicate the Soviet Union have much to learn in the operations of passenger ships which is a specialized field and requires years of experience.

Open Ship

6. The A. PUSHKIN was not opened to the general public as had been expected by many local people in Montreal. However, selected groups were given conducted tours.

SECRET

(Alexandr Pushkin  
cont'd)

SECRET  
JIB(CAN) 11/66

7. Source arrived on board at 0920 and was met by charming hostesses who conducted him to the music room. Preparations were in effect for the official signing of the Expo 67 lease of the land on which the Russian pavilion was built. After talking to an assistant purser and the second senior purser, the Chief Radio Officer was finally located. During the intermediate interval of time, Source was seated in the music room and witnessed the social and official preparations for the arrival of Mr. Dupuis and Mr. Shaw, the senior Canadian officials. The areas for the passengers were well appointed, particularly the music room and lounges. All doors were marked permanently in English and Russian, but not French, which is surprising considering that the liner will be running from Leningrad to Montreal. In the midst of the crowd, the same two Russian Embassy officials from Ottawa, who were met on the OIEGENORSK, were noticed.

Draught

8.	ARRIVAL	FORWARD	23'03"	AFT	27'00"	MEAN	25'01 $\frac{1}{2}$ "
	DEPARTURE	FORWARD	24'00"	AFT	26'00"	MEAN	25'00"

Date of Report: 30 May, 1966  
Source: DGI/INT S

SECRET

SECRET  
JIB(CAN) 11/66

XVI.

USSR

SHIPPING - Merships

Soviet Tanker LISICHANSK, Halifax  
23-29 March, 1966

1. The Soviet tanker "LISICHANSK" (UYXF) was in Halifax 23-29 March, 1966.

Purpose of Visit

2. To load a cargo of wheat destined for USSR.

Personalities

3. This Captain was very youthful in appearance. He wore only three rings on his uniform coat sleeves to denote his rank as opposed to the normal four. The Chief Officer of the ship also wore three rings.

Captain:	SELIVERSTOV (Surname only - First name
Height:	5 ft. 10 in. not available)
Weight:	190 lbs.
Hair:	Golden blonde
Complexion:	Light "pinkish" - clear skin
Eyes:	Dark blue
Facial Features:	Round face
English:	Good

Date of Report: 29 April 1966  
Source: DGI/INT S

SECRET



SECRET  
JIB(CAN) 11/66

XVII.

USSR

SHIPPING - Merships

Soviet Cargo Motorship NIKOLAYEV, Halifax  
27 March - 14 April 1966

1. The Soviet Cargo Motorship "NIKOLAYEV" (callsign UBRW) was in Halifax  
27 March - 14 April 1966.

2. The Captain had 15 bottles of champagne in the liquor cabinet in his  
cabin, one of which he shared with his callers on arrival at Halifax. The  
presence of the champagne is very unusual.

Crew

3. The crew were all smartly dressed in good quality clothing and appeared  
to be as naval or ex-naval personnel since there was a definite aura of strict  
discipline on board.

Remarks

4. The ship appeared to be exceedingly well run, clean and happy, a high  
state of discipline was in evidence.

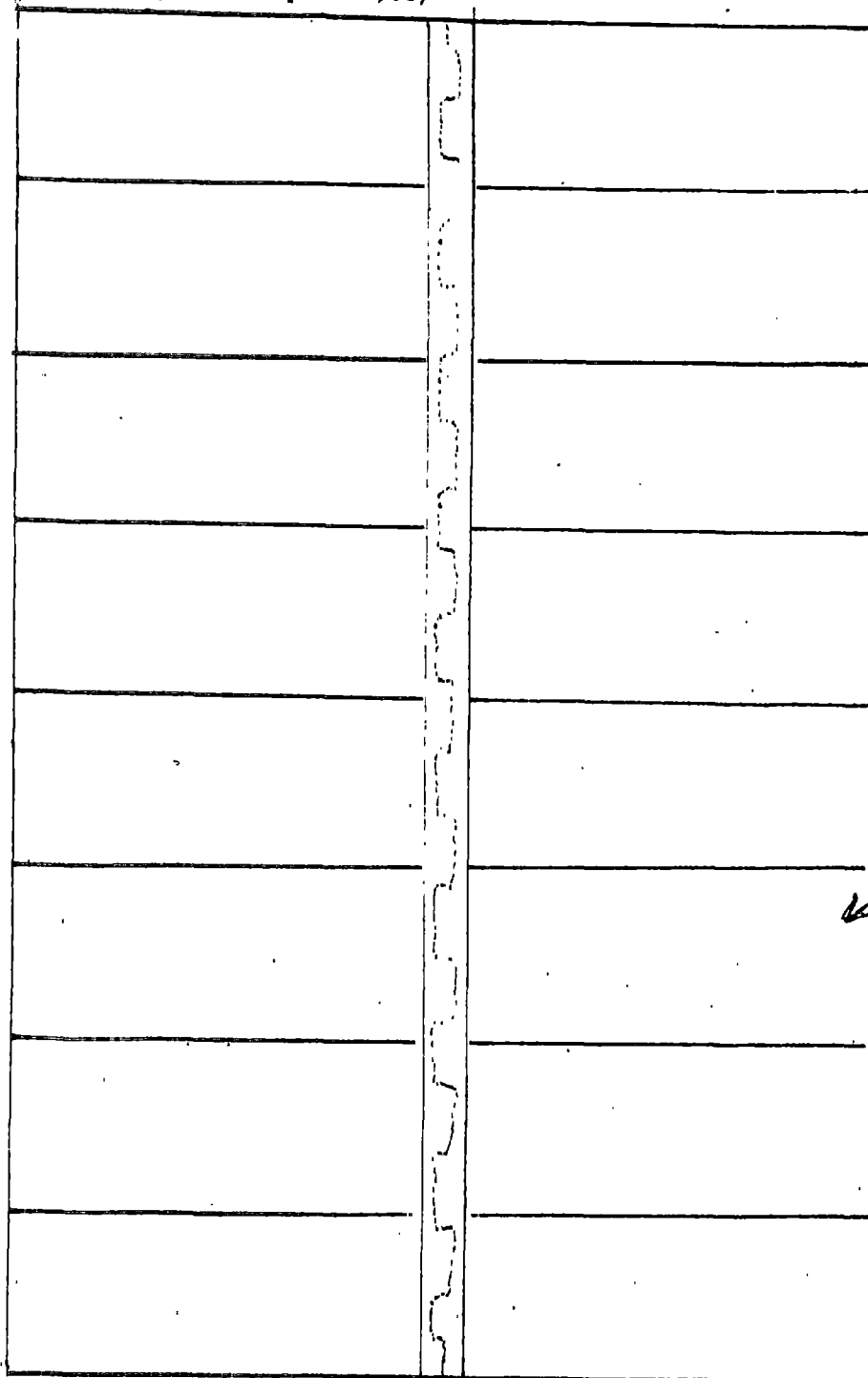
Personalities

5.	Captain:	OLEG BERKOV
	Height:	5 ft. 7 in.
	Weight:	135 lbs.
	Eyes:	Blue
	Hair:	Light brown - thin - brushed straight back
	Complexion:	Light - clear skin
	Facial	Deep line down each cheek; teeth exceedingly
	Features:	good - outstanding (not false)
	Visible Marks	Sailing ship tattooed on left forearm
	or Scars:	
	English:	Perfect - only very slight accent
	Appearance:	Exceedingly smart - very neat and proper - high degree decorum

Date of Report: 20 May 1966  
Source: DGI/INT S

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(NIKOLAYEV, March-April 1966)



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JTR(CAN)11736

45

Figure 1

Plan view rough drawing (not to scale) upper deck level of hold of Soviet dry cargo ship NIKOLAYEV at Halifax, N.S. April, 1966. The hatch covers of hold are depicted in the closed position. Dotted line down centre depicts steel corrugated centreline bulkhead vertical to ship's keel. Corrugation configuration is also vertical to ship's keel. All of No's 2,3,4, and 5 holds had same configuration except that No. 4 hold was much larger than the others.

SHIPS  
STBD  
SIDE

HATCH  
COVERS  
IN POS'N

(NIKOLAYEV, March-April 1966)

46

SECRET  
JIB(CAN)11/66

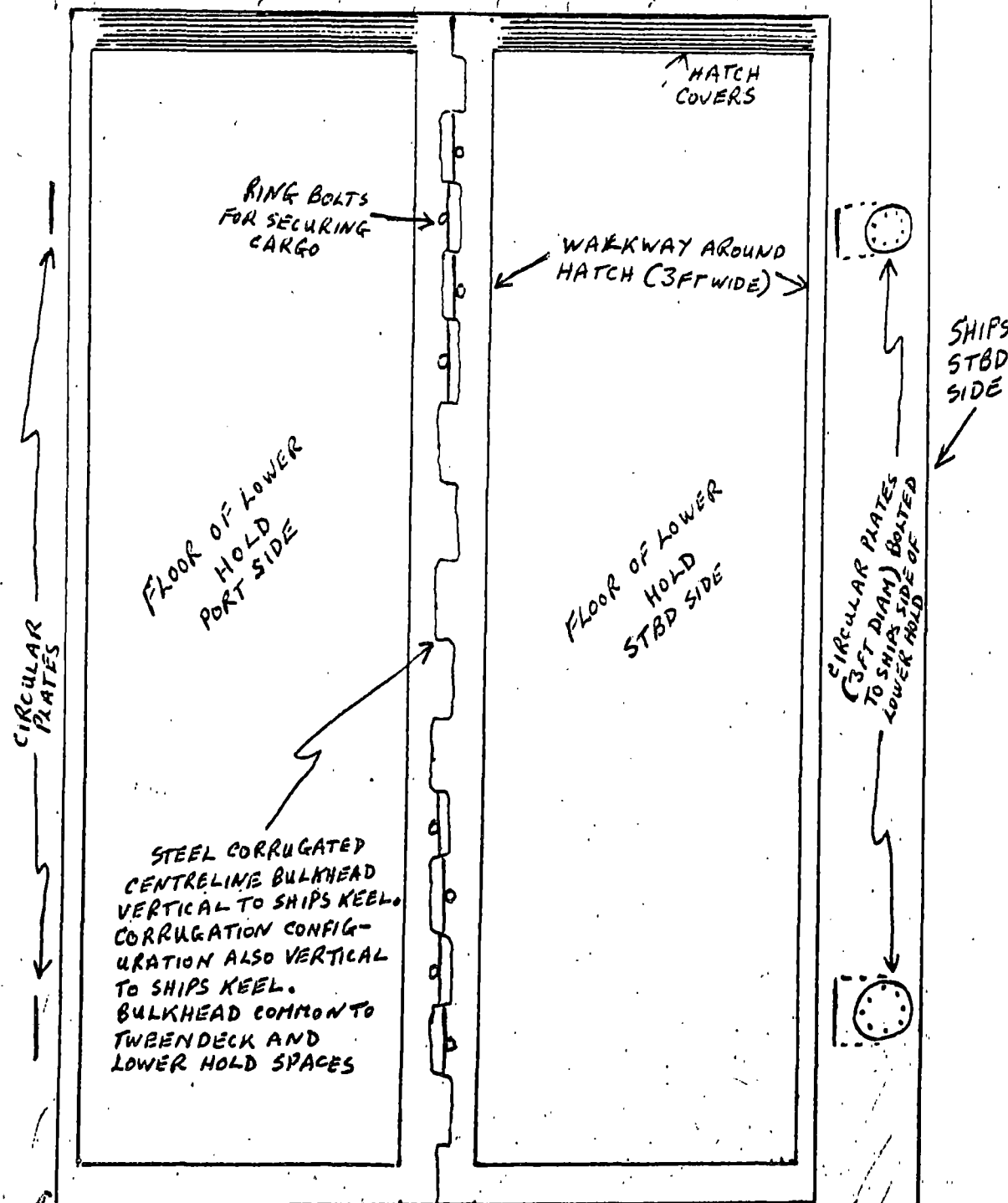
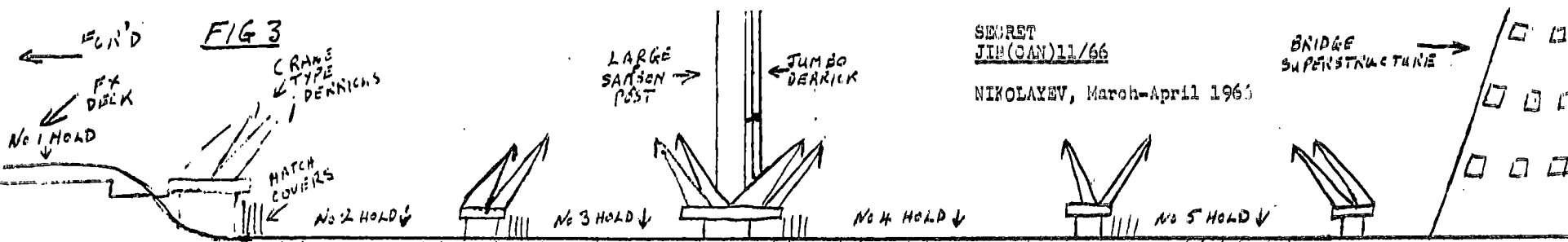
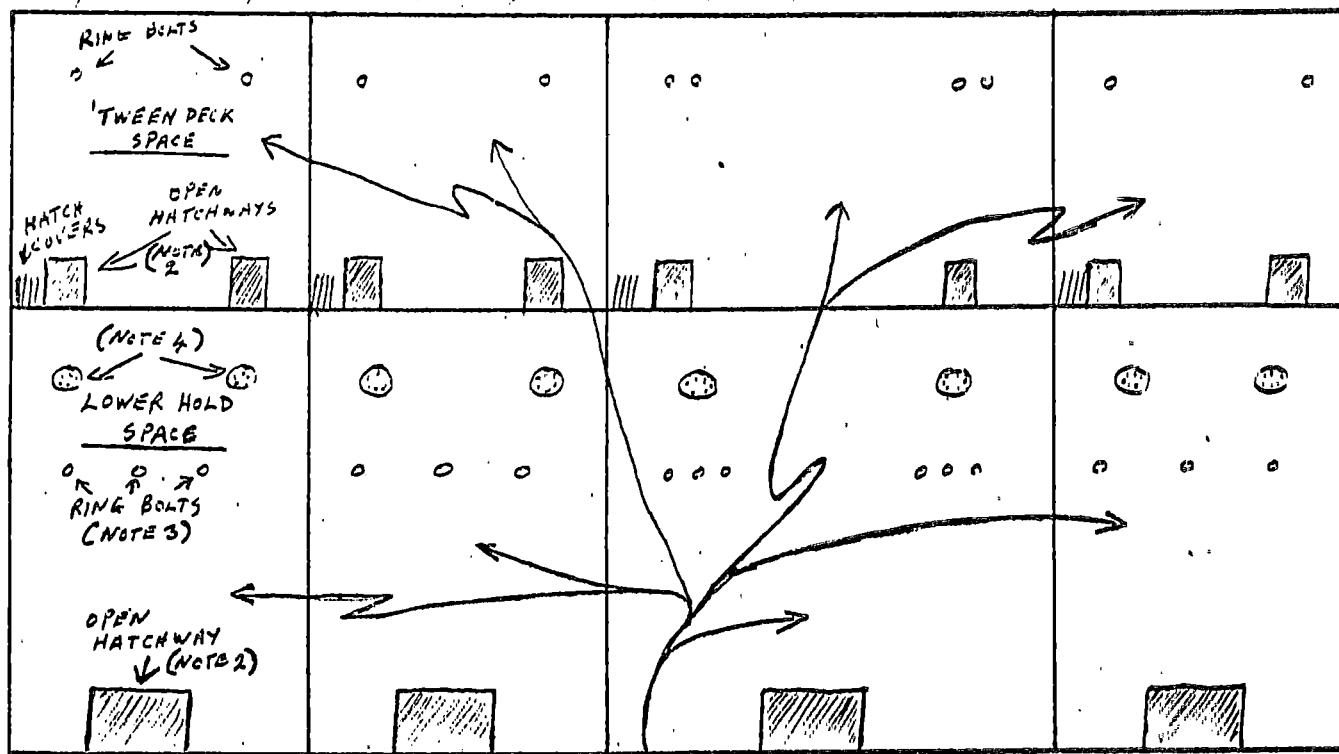


Figure 2

Plan view rough drawing (not to scale) of tweendeck level of an open hold of Soviet dry cargo ship NIKOLAYEV at Halifax, N.S. April, 1966. The tweendeck hatch covers are depicted in the open stowed position. The circular plates depicted are secured to the port and stbd. of each hold. These plates are considered to be covers for openings to allow access to wing ballast tanks since the ship's tonnage certificate (No. 29, Item 15 of photostat) states that water ballast is allowed for in tanks other than double bottom tanks to the amount of 2199.55 cubic meters, and it is believed that the wing tanks are for this purpose. However, it is quite unusual for a merchant ship to have such tanks designed into the construction of the ship. The relative position of these circular plates on the sides of the lower hold spaces can be seen in Figure 3. As can be seen from Figure 2, the centreline corrugated bulkhead divides each hold into two separate halves thereby reducing the cargo carrying capability considerably. All of Nos 2,3,4, and 5 holds had same configuration except No. 4 hold was much larger than the others.



No 1 HOLD  
REMAINED COVERED  
WHILE SHIP WAS  
IN PORT.



No 6 HOLD AFT  
OF BRIDGE  
SUPERSTRUCTURE  
AND IS REFRIG. HOLD,  
(HEARSAY).

STEEL CORRUGATED CENTRAL BULKHEAD VERTICAL TO  
SHIP'S KEEL DIVIDING EACH HOLD INTO TWO HALVES  
(SEE NOTE 2)

SOVIET MERCHANTSHIP NIKOLAYEV HFX 1966 APRIL

47

(NIKOLAYEV, March-April 66)

SECRET  
JIB(CAN)11/66

48

### Figure 3 - Explanation

Free hand (not to scale) drawing of cross section No's 2, 3, 4 and 5 holds of Soviet dry cargo mership NIKOLAYEV at Halifax, N.S. April 1966, as seen from port side with ship's side cut away. All of these holds have the same configuration and fittings except that No. 4 hold is approximately 1.5 times larger than the others.

#### Note 1:-

Drawing shows centreline corrugated bulkhead common to tween deck and lower hold spaces which divides each hold into two halves (port and stbd). The corrugated configuration of this bulkhead is vertical to the ship's keel as opposed to the more usual longitudinal. (See figures 1 and 2). As will be noted this bulkhead considerably reduces the ship's cargo carrying capability. A junior officer of the ship's company remarked that the ship "designed for war machines" (hearsay)

#### Note 2:-

The open hatchways depicted are in fact hatchways cut into the centreline bulkhead to allow access between the two halves of the holds. The hatchways depicted in the tween deck spaces are of the size of a very large doorway whereas the ones depicted in the lower hold spaces are of the size of a very large double doorway. These hatchways are apparently always open since there are no appurtenances around the perimeters to which a cover could be secured and there were no covers in evidence. One of the junior officers of the ship remarked that the hatchways were for ventilation.

#### Note 3:-

The ring bolts depicted are not shown accurately in quantity but the drawing does show their approximate position on the centreline bulkhead. These ring bolts are welded to a steel plate which in turn is welded across a depression of the corrugation (See Figure 2).

#### Note 4:-

These are circular plates (approx. 3 ft. in diameter) secured by bolts to the ship's side of each hold and not to the centreline bulkhead. They are included in this drawing (Fig. 3) only to depict their relative position on the ship's side of the hold (See Figure 2).

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JIB(CAN) 11/66

XVIII

USSR

SHIPPING - Mer ships  
Soviet Cargo Motor Vessel "POLTAVA"  
Halifax 12-14 Feb 66

1. The Soviet cargo motor vessel "POLTAVA" (URDQ or UKTH) was in Halifax 12-24 February, 1966.

Unusual Construction Features of Ship

2. POLTAVA has unusually large cargo hatches that extend almost the entire width of the main deck. However, there appears to be nothing unusual about the holds themselves, all of them appearing to be of the conventional size for such a ship.

Personalities

3.	Captain:	VITALI POGORELOV
	Height:	6 ft
	Weight:	200 lbs
	Facial Features:	Dark complexion - refined, attractive features, one gold tooth upper left
	Hair:	Straight, black
	Eyes:	Dark Brown
	Visible Scars/Marks:	Mole left side of face by nose
	English:	Good

Date of Report: 22 March 1966  
Source: DGI/INT S

SECRET

SECRET  
JIB(CAN) 11/66

XIX

USSR

SHIPPING - Fishing Fleets  
Trawler ALIOTH, Halifax  
4-6 May, 1966

1. The Soviet refrigerated fishing trawler "ALIOTH" (SRIM 8005) (callsign not known) was in Halifax 4-6 May, 1966.

Remarks

2. The visit outlined above appeared to be routine in all respects.
3. When the ship arrived the Captain stated that he only had a crew of twenty (19 of the old crew and one man he had picked up whilst on the fishing grounds). The ship's Chief Mate who was present corrected the Captain's statement by saying that there was a crew of 21 since they had embarked 2 men on the fishing grounds. When the Captain heard this statement he became infuriated and apologized strenuously to all concerned. In fact he apologized for two days. It is not known why the Captain was so effusive in apologizing.

Personalities

4. 

Captain:	FEDOR KOVTUN
Height:	5 ft. 7 in.
Weight:	170 lbs.
Hair:	Light brown
Eyes:	Light grey
Facial Features:	3 gold teeth upper right - 1 gold upper left
Visible Marks:	2 indented scars left temple
English:	poor

The Captain stated that his home was in Kiev.

Date of Report: 20 May 1966  
Source: DGI/INT S

SECRET

SECRET  
JIB(CAN) 11/66

XX

USSR

SHIPPING - Fishing Fleets  
Motor Tanker YELSK, Halifax  
27-28 February 1966

1. The Soviet motor tanker "YELSK" (UWOI) was in Halifax 27-28 February 1966.

Ship's Particulars

2.	Built	:	1960 Leningrad
	GRT	:	7949
	Net Tonnage	:	3928
	Official Number	:	25184
	Propulsion	:	One propeller - 2 diesel engines with 2000 EHP each number 8DR43/61
	Radio	:	Call sign UWOI - one operator

3. The Captain, VLADIMIR VASILEV was the master of a Soviet Naval 3-masted training ship (possibly the DUNAY) for 15 years. This training ship carried 20 sails and 200 cadets. He has travelled extensively to all parts of the world but the visit to Halifax outlined above is his first visit to North America. The Captain stated that the Soviet Naval authorities wanted him to return to the cadet training ship last year (1965) but he said that he refused.

Personalities

4.	Captain:	VLADIMIR VASILEV
	Height:	5 ft 11 in. approx.
	Weight:	210 lbs approx.
	Physical Features:	Tall and well built
	Hair:	Straight dark hair streaked with grey
	Facial Features:	Thin medium face with hairline mustache. Features of a westerner. Many gold teeth.
	Age:	57
	English:	Very good
	Appearance:	Well dressed - dignified appearing individual

Date of Report: 22 March 1966  
Source: DGI/INT S

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JIB(CAN) 11/66

XXI

USSR

SHIPPING - Fishing Fleet Research  
Trawler OBDORSK, Halifax  
11-12 February, 1966

1. The Soviet research trawler "OBDORSK" (SRTR 9029) (callsign UBJH) was in Halifax 11-12 February 1966.

Personalities

2. MASTER: GENADY MELNIKOV

Captain MELNIKOV was Master of this trawler when she called at Halifax in 1963.

Instructor of Fishery

3. Mr. Artur SARNITS (Crew List #24) paid a previous call to Halifax when he was attached to the Research trawler OLENJI (SRTR 9074) in 1963. It is considered that he carries a rank equivalent to that of Chief of Expedition. He is a noted authority and scientist in the USSR fisheries industry, has served on the International Convention for Fisheries and has been highly decorated by the Soviet Government for his services.

4. Mr. SARNITS was married in March 1965. His wife is 24 years old and is expecting her first child very soon. She also is a scientist and is or was employed in the same field of research as her husband.

5. During this visit to Halifax Mr. SARNITS wore a short beard which he did not have previously. The beard may be to conceal his features as his face is very thin with the skin pulled taut over the bone.

6. Mr. SARNITS speaks English well and is an ardent reader of English periodicals and magazines of the Western World. When some of these magazines were presented to him as a gift he was most careful to hide them quickly and stated that he did not want others to see them.

Date of Report: 22 March 1966  
Source: DGI/INT S

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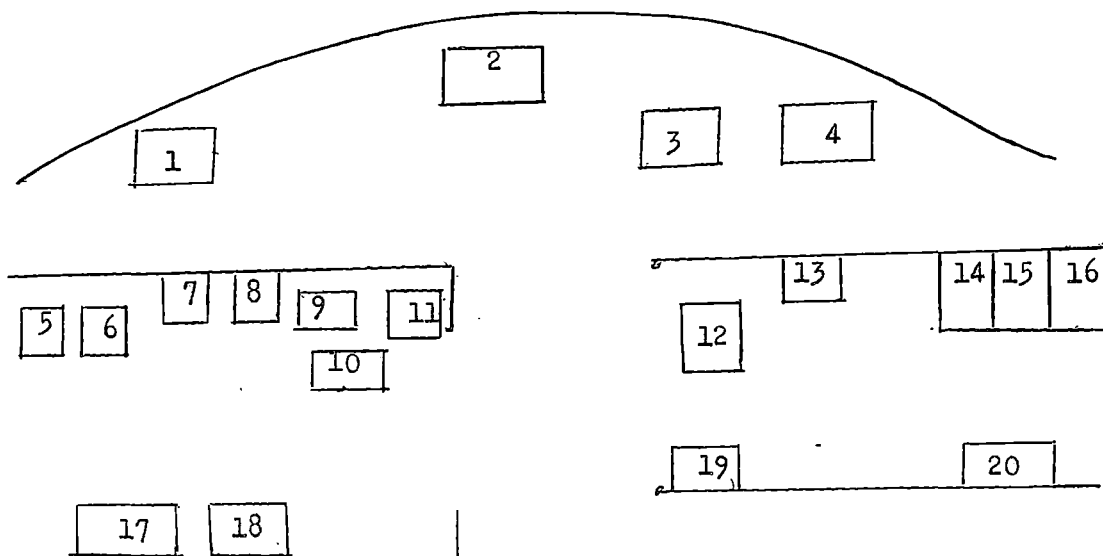
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JIB(CAN) 11/66

XXII.

USSR

SHIPPING - Electronic Report  
Soviet Vessel ALEXANDRA PUSHKIN, Montreal  
28 April 1966

1. The Soviet Vessel "ALEXANDRA PUSHKIN" (callsign not known) (Official No. 01062) inspected in Montreal 28 April 1966.
2. The electronic equipment in general was in excellent condition, robust and very practical. The layout of radio room, chart room and bridge areas was as follows:



- |                                     |                          |
|-------------------------------------|--------------------------|
| 1. DON Radar                        | 9. HF Receiver           |
| 2. BINNACIE & Auto Control          | 10. Tape Recorder        |
| 3. Auto Engineroom Control          | 11. HF Transmitter       |
| 4. DON Radar                        | 12. Automatic Relay      |
|                                     | Position & Distress      |
| 5. Main Transmitter                 | 13. Decca Navigator      |
| 6. Main Receiver                    | (14.                     |
|                                     | 15. D/F Russian & German |
| 7. Remote Control for Transmitter   | 16. LORAN - 19 VHF       |
| 8. Emergency Transmitter & Receiver | 17. Auto Alarm - 20 VHF  |
|                                     | 18. Frequency Meter      |

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(Alexandra Pushkin  
cont'd)

SECRET  
JIB(CAN) 11/66

The particulars of the electronic equipment are as follows:

Main Transmitter	P643	No. 40029	20 Kc/s-720 Kc/s	1 KW
HF Transmitter	P641	No. 40032	1.0-24 Mc/s	1 KW
Emergency Transmitter	ASF4	No. 1091964	400-720 Kc/s	22.5 W
VHF Transmitter	RFT		156-174.0 Mc/s	15 W
AKACIA Trans. VHF		No. 1965R 650189	156-174.0 Kc/s	15 W
Radar DCM		No. 1964R 30601	3 cms	80 KW(peak)
Radar DCM		No. 1964R 30602	3 cms	80 KW(peak)
Main Receiver	15433		20 Kc/s-23 Mc/s	
Emergency Receiver	PA5		400-550 Kc/s	
HF Receiver		24981963R	12 Kc/s - 1.5 Mc/s	
Auto Alarm		APM 54.P No. 1334	488 - 512 Kc/s	
D/F RFT		51-61-232	200-540, 1.5-30	
D/F	5RP5	018150064	180 - 200 Kc/s	
Lifeboat Apparatus	- PIOT (2) SILVPE (4)			

Frequencies - 500, 83.64 - 5 watts.

Transmitting Frequencies - both communicating & navigation.

A <sub>1</sub> A <sub>2</sub>	425, 454, 468, 480, 500, 512, 410
A <sub>3</sub>	2100, 2310, 2525, 3180, 27,100, 31,800
A	4182, 6273, 12,540, 16,728, 22,245, 8370

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(Alexandra Pushkin  
cont'd)

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JIB(CAN) 11/66

They have teletype and auto morse facilities, although the particulars of the equipments were not available. There are six radio officers all holding first class certificates. None of the radio operators could speak more than three-four words of English and all of the interrogation was done through the assistant purser.

Antennas

3. There were six whip H/F antennas; two VHF antennas (dipole and one monopole); two DON radar antennas; two MF/DF loops, and four HF centre fed FLAT TOPs.

Date of Report: 30 May 1966  
Source: DGI/INT S

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JIB(CAN) 11/66

XXIII

USSR

SHIPPING - Electronic Reports  
Mer ship LISICHANSK, Halifax  
24 March 1966

1. The Soviet mer ship "LISICHANSK" was inspected in Halifax 24 March, 1966. Her callsign is UYXF; port of registry, ODESSA; owners, USSR; tonnage, gross 23153.28, net 14569; 2 radio operators. Valid safety radio certificate carried. She was apparently built in Japan for Russia.

<p><u>BRIDGE</u></p> <p>1. JAPANESE MADE RADAR TYPE "ANRITSU"</p> <p>2. R/T XMTR/RCVR, XMTR MOD. SS-5115A, RCVR MOD. 4S-5056A, FOUR FIXED FREQS 2049 2182 2525 &amp; 3180 KC/S, APPROX OUTPUT 25 WATTS.</p>		1
2	3	
<p>3. VHF XMTR/RCVR, TYPE "AKACIA", 6 WATTS, THREE FIXED FREQS 104 125 &amp; 132 MC/S.</p> <p>5. LIFEBOAT PORTABLE RADIO EQUIPMENT, W/NO M, 500 6273 &amp; 8364 KC/S</p> <p>6. SPARE RCVR, BOA HA-K, #196518877, 12 KC/S - 23 MC/S.</p> <p>7. RUSSIAN MADE VARIABLE FREQUENCY OSCILLATOR USED IN CONJUNCTION WITH JAPANESE MADE H/F XMTR, NO MODEL OR MARKINGS VISIBLE.</p> <p>8. JAPANESE MADE CONSOLE CONSISTING OF FOLLOWING UNITS: ALL MADE BY "TOKYO SHIBAURA ELECTRIC CO.": MAIN XMTR, TYPE SS 510 C, 250 WATTS, A1 &amp; A2, 410 - 512 KC/S. H/F XMTR, TYPE SS1027C, 250 WATTS, A1 &amp; A2, 2 - 24 MC/S. EMGY XMTR, TYPE SS5107A, 50 WATTS, A1 &amp; A2, 410 - 512 KC/S. MAIN RCVR, TYPE 4S-1413A, 14 - 1700 KC/S. H/F RCVR, TYPE NOT VISIBLE, 90 KC/S TO 25 MC/S. EMGY RCVR, TYPE 4S-5052A, 400 - 550 KC/S. AUTO ALARM &amp; A.K.D., TYPE FS-5091-B.</p>		<p><u>CHART ROOM</u></p> <p>4. JAPANESE MADE D/F, MOD. KS-3230, KODEN ELEC. CO., FREQ RANGE 200 - 4000 KC/S</p> <p>4</p> <p><u>RADIO ROOM</u></p> <p>9. RUSSIAN RCVR TYPE P-670 90 KC/S - 25.5 MC/S.</p> <p>10. RUSSIAN MADE TAPE RECORDER.</p> <p>11. ADDITIONAL AUTO ALARM, TYPE A 7 M-54, #1206.</p> <p>12. CHARGING BOARD AND CONTROL PANEL.</p>
<p>6</p> <p>7</p> <p>8</p> <p>9</p>		<p>12</p> <p>11</p> <p>10</p>

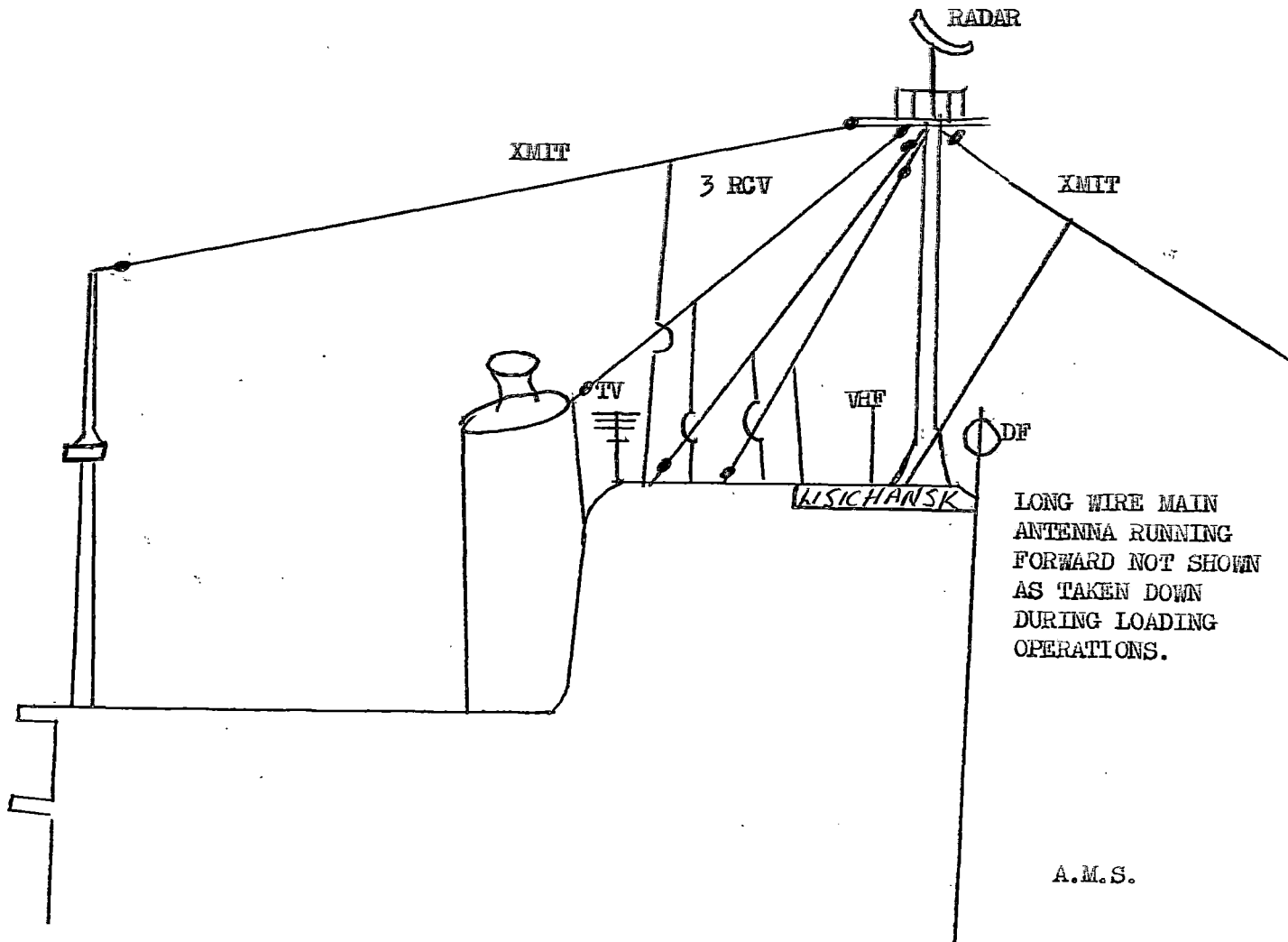
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JIB(CAN) 11/66

(LISICHANSK electronic report,  
24 March 1966)

VISUAL INSPECTION OF ANTENNA



DATE OF REPORT: 24 March 1966  
SOURCE: DGI/INTS

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14 July 1966

DATE \_\_\_\_\_

**JOINT INTELLIGENCE BUREAU**  
**Ottawa**

ITEMS OF  
ECONOMIC & TOPOGRAPHICAL  
INTELLIGENCE FROM CANADIAN SOURCES

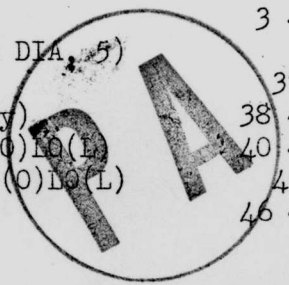
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ITEMS OF ECONOMIC AND TOPOGRAPHICAL  
INTELLIGENCE FROM CANADIAN SOURCES.

June 1966

ITEM	COUNTRY & SUBJECT	CLASS'N	PAGES
<u>CHINA</u>			
I.	SHIPPING - Boarding Report: Heungnam, 16 Apr-1 May 66	(S)	1 - 2
<u>NORTH KOREA</u>			
II.	SHIPPING - Boarding Report: Chinnampo, 4-18 Apr 66	(S)	3 - 5
<u>ISRAEL</u>			
III.	ECONOMICS - Budget, April 1966	(S)	6
<u>U.A.R.</u>			
IV.	ARMAMENTS - Shipments, Sudan May 1966	(S)	7
<u>YEMEN</u>			
V.	ARMAMENTS - May 1966	(S)	8
...(1)			

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).

EVALUATIONS

- |                                 |                                |
|---------------------------------|--------------------------------|
| A. Completely reliable          | 1. Confirmed from other source |
| 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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(ii)

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JIB(CAN)12/66

ITEMS	COUNTRY & SUBJECT	CLASS'N	PAGES
<u>CZECHOSLOVAKIA</u>			
VI.	PRODUCTION - Vehicles, OT64 and OT 65, May 1966	✓ 905-2000-11 (S)	9
<u>FINLAND</u>			
VII.	TOPOGRAPHICAL INTELLIGENCE - Viborg, 7-8 June 66	✓ 922-2000-11 (S)	10 - 12
<u>HUNGARY</u>			
VIII.	PRODUCTION - Vehicles, OT65, May 66	✓ 905-2000-11 (S)	13
IX.	MISSILES - Rocket Bases, Czechoslovakian Border Area, 1965	✓ 922-2000-11 (S)	14
<u>U.S.S.R.</u>			
X.	MISSILES - Facilities, Moscow-Yaroslavl Road, 9 May 66	✓ 922-2000-11 (S)	15
XI.	TOPOGRAPHICAL INTELLIGENCE - Moscow-Yaroslavl Trip 9-10 May 66	✓ 922-2000-11 (S)	16 - 22
XII.	SHIPPING - Merships: Visit, Motorship KRIPTON, Halifax, 19-20 May 66	922-2000-6-1 (S)	23
XIII.	SHIPPING - Fishing Fleet: Soviet Factory Trawler BERYLL, at Halifax 25 Apr-5 May 66	✓ 922-2000-6-1 (S)	24
XIV.	SHIPPING - Electronic Reports: Soviet Vessel OLEGENORSK, Montreal, 19-26 Apr 66	✓ 922-2000-6-1 (S)	25 - 27

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000680

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JIB(CAN) 12/66

I.

CHINA

SHIPPING - Boarding Report  
Heungnam, 16 Apr-1 May 66

Port Information

1. On arrival, Source's vessel anchored in 18-19 fathom patch, eight miles from HEUNG NAM (SEI KOSHIN). Draft on arrival was 29'10" even keel. Vessel lightened to 27'4" before coming alongside.
2. Alongside, the vessel discharged into one of three godowns on the wharf. These sheds had removable covers. The ships were serviced by four gantry and one jib-type cranes. The jib crane was used for wharf work. The gantry cranes operated over the sheds and could drop the cargo in any required position. Each of the three sheds measured approximately 600' x 150'. A new wharf had been constructed across the harbour from the commercial wharf, and this wharf could handle vessels up to 200' in length but draft would be limited.
3. Fresh water was available on the quay. Provisions were said to be available. When ordered, only a limited quantity of rice was provided.

General

4. Shore leave was limited to the Dock Area, but the Ship's Agent stated organized, guided tours could be arranged outside of the immediate port area. Although propaganda was directed toward Japan, as well as USA, by means of posters no attempt was made to "spread the word" verbally. The steel plant and the fertilizer plant appeared to be working to full capacity.
5. A sketch of the area is attached as Appendix "A".

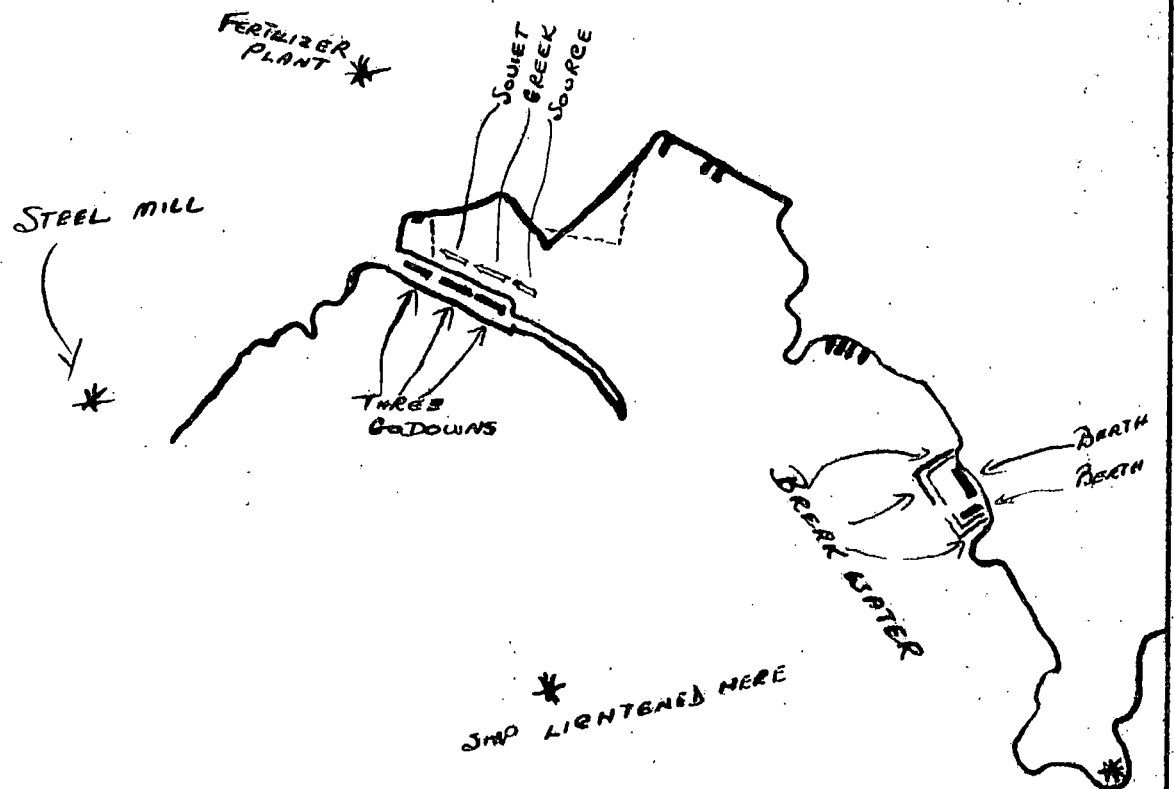
Report & Date: WC DBR 21/66 of  
6 June 1966  
Source: DGI/INT S

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(HEUNG NAM boarding report  
16 Apr-1 May 66)

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Appendix A



SECRET  
JIB(CAN) 12/66

II.

NORTH KOREA

SHIPPING - Boarding Report  
CHINNAMPO, 4-18 April 1966

Port Information

1. On arrival, source anchored in position (a) - Appendix "B", and the bottom of the harbour was extremely muddy and source's vessel experienced silt clogging its pumps. At anchorage, source's vessel lightened to a draft of 25 $\frac{1}{2}$ '. However, this was insufficient on arrival alongside (Appendix "B") and the vessel settled on the soft mud. Discharging was effected, using two travelling cranes (probably three) at the berth. These cranes had a high jib for loading into sheds on the berth.

2. Fresh water was available, both by barge and at the berth. The small outlet on the berth - limited quantity. The principal requirement was normally delivered by barge. Fresh provisions were offered, but none required. The agent attempted to sell fuel to the ship, and source was of the opinion the agent was under instruction to attempt to have the ship purchase fuel in order to ease the country's currency problems. Source, however, did not obtain any fuel.

Shipping

3. Source is of the opinion that a large Dutch owned-leased dredger, at present in drydock, will soon operate in the port to clear the heavy silted harbour. The present small Chinese dredge was not adequate to keep the harbour clear.

4. On arrival, the buoy marking entrance to PINGYANG INLET was unlit. On departure, however, it was burning. The light on the end of the berth on the eastern side of HITATSUTO was very dim.

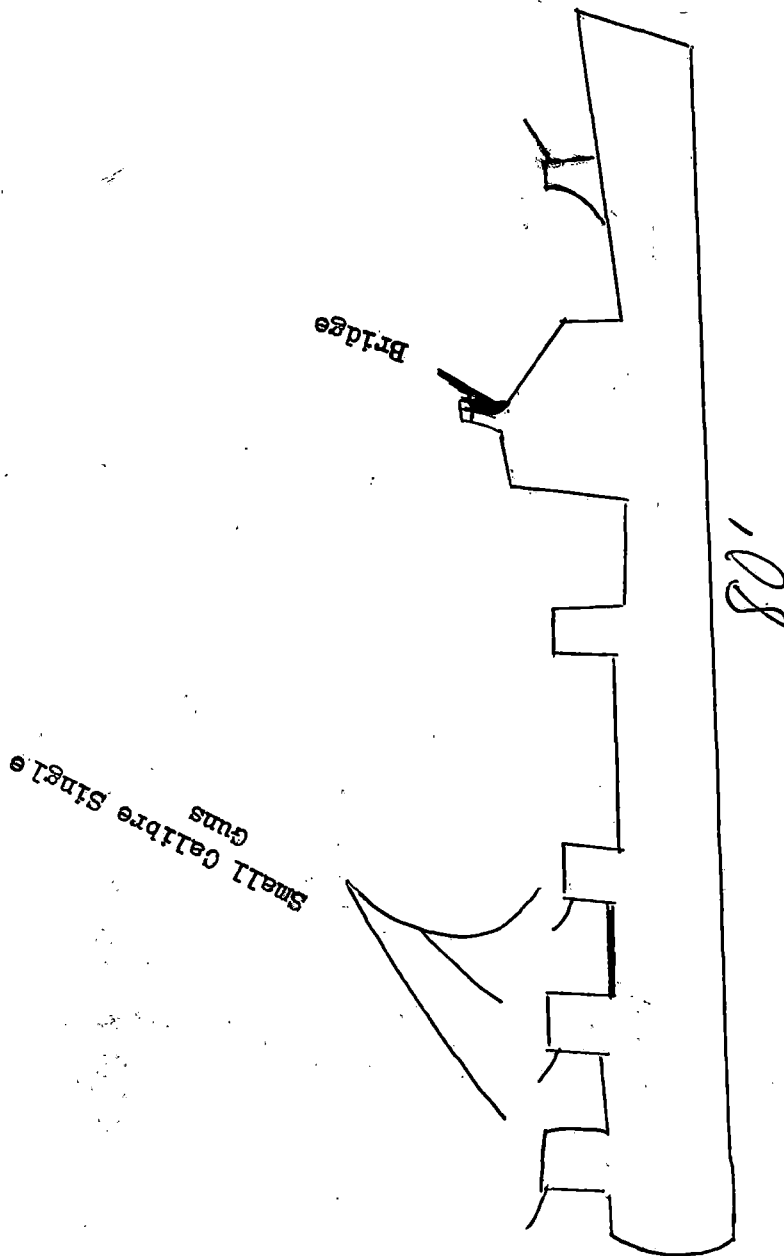
Date of Report: 26 May 1966  
Source: DGI/INT S

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JIB(CAN) 12/66

APPENDIX "A"

(Boarding Report, Chinnampo, Cont'd)

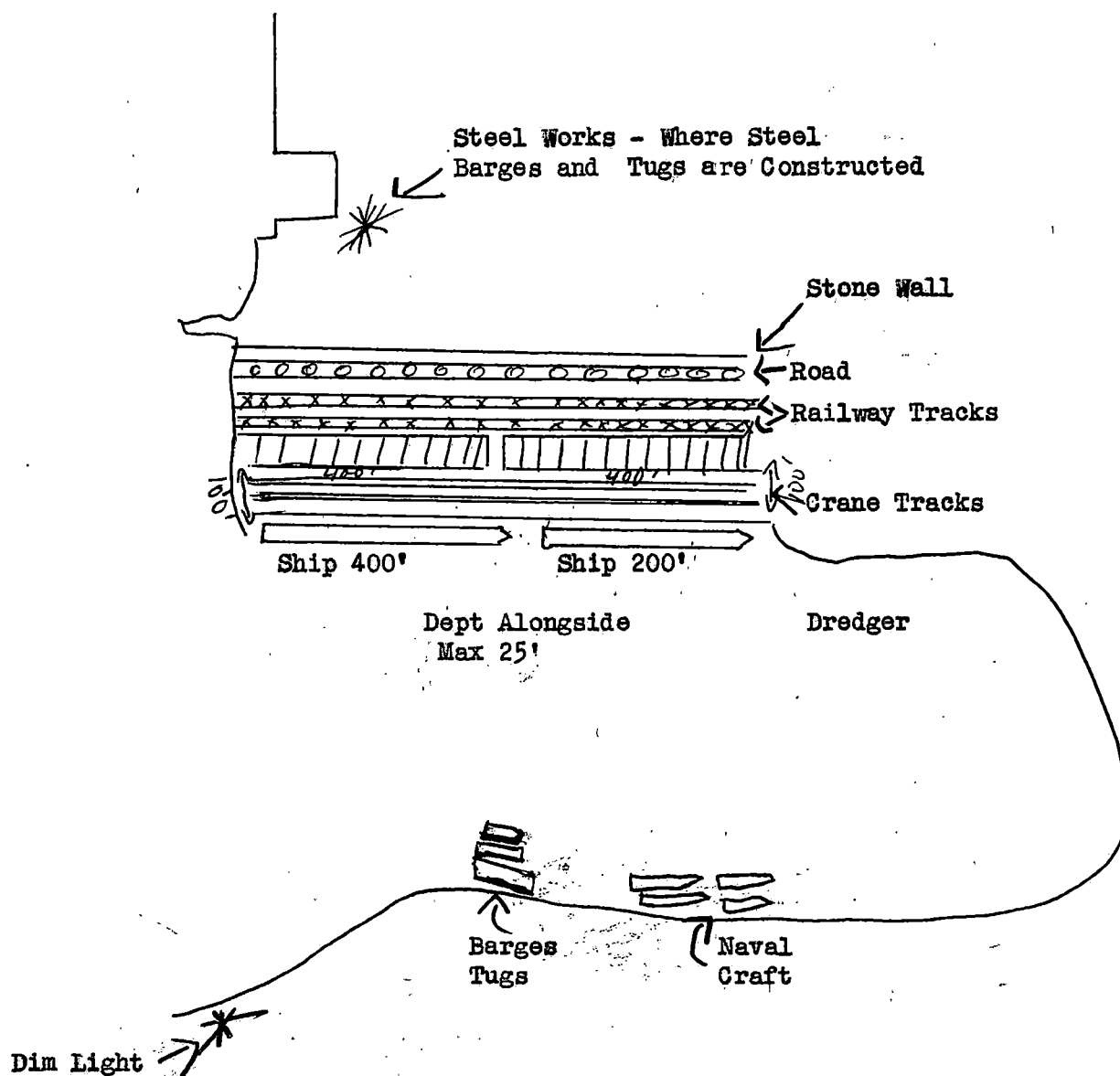


APPROX. 5-6 OF THESE - PECULIAR FEATURES: THREE GUNS AFT.

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APPENDIX "B"

(Boarding Report, Chinnampo, Cont'd)



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III.

ISRAEL

ECONOMICS - Budget  
April 1966

1. In April, a group of Canadians visited Israel and during a briefing by Dr. Dinstein, the Deputy Minister of Defence, he admitted that the published figures for Defence expenditure in no way gave an accurate picture of the annual cost of defence to Israel. He explained that defence funds were secret, and that accurate figures were available to very few members of the Knesset and civil servants, and then only on a need to know basis.

Date of Report: Feb/April 1966  
Source: CFA/Tel Aviv

SECRET

SECRET  
JIB(CAN)12/66

IV.

U.A.R.

ARMAMENTS - Shipments  
Sudan, May 1966

1. In February 1966, a shipment of about 300 tons of arms was received at PORT SUDAN from ALGERIA.

2. These arms, which are of Soviet and Chinese origin, have been seen in depots in Khartoum. Some of the weapons have been identified as

- 6       --76 mm guns (Soviet)
- 1       --82 mm RCL (Soviet)
- 1       --12.7 Heavy MG (Soviet)
- 150/200--7.62 mm rifles (Soviet)
- 1       --7.62 mm LMG (Soviet)
- 20      --cases of small arms (Chinese)

3. Recently the Chinese weapons have been seen being packed in new boxes, and may be intended for shipment to YEMEN, as a delegation from that country has visited recently and received some support.

Evaluation: A - 2  
Report & Date: IR 24/66 of  
19 May 1966  
Source: CFA/Cairo

SECRET



SECRET  
JIB(CAN) 12/66

V.

YEMEN

ARMAMENTS  
May 1966

1. Recently, Chinese small arms, which have been seen in depots in Khartoum, have been noted packed into new boxes.
2. It is possible these are for shipment to YEMEN.

Report & Date: IR 24/66 of 19 May 1966  
Source: CFA/Cairo

SECRET

SECRET  
JIB(CAN) 12/66

VI.

CZECHOSLOVAKIA

PRODUCTION - Vehicles  
OT64 and OT65, May 1966

1. The Canadian Air and Military Attache attended a film showing in Prague, 30 May, during which a film on army training manoeuvres - narrated in Czech - showed an OT65 in operation. It was stated that this vehicle is produced in Hungary.

2. Another film narrated in English, referred to the OT64 as "Czech SKOT" (possibly derived from SKODA/TATRA?). It was clearly stated that the vehicle is produced in Czechoslovakia. The narrative included the following information:

- (a) Engine - 8 cylinder, 180 HP TATRA air-cooled, multi-fuel, mounted in centre of the vehicle;
- (b) Range - 400 miles;
- (c) Speed - 60 mph on land, 5 mph on water;
- (d) Transmission - Semi-automatic WILSON/PRAGA with five forward speeds and one reverse;
- (e) Performance - 70% incline;
  - 6½ ft open ditch;
  - 10 metre turn radius in water;
  - central inflation/deflation mechanism for tires, and wheels have individual suspension;
  - operates efficiently with any two wheels out of order;
  - can be hermetically sealed for ABC warfare so troops do not require individual protection;
  - engine driven pumps provide purified air. If these pumps are out of order, hand pump is adequate. Same applies to water pump when swimming;
  - Carries 2000 lbs cargo, or 18 armed troops who can fire out of ports while vehicle is in motion.

Evaluation: B - 2  
Report & Date: IR 20/66 of  
31 May 1966  
Source: CA&MA/Prague

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SECRET

JIB(CAN) 12/66

VII.

FINLAND

TOPOGRAPHICAL INTELLIGENCE

Viborg, 7-8 June 1966

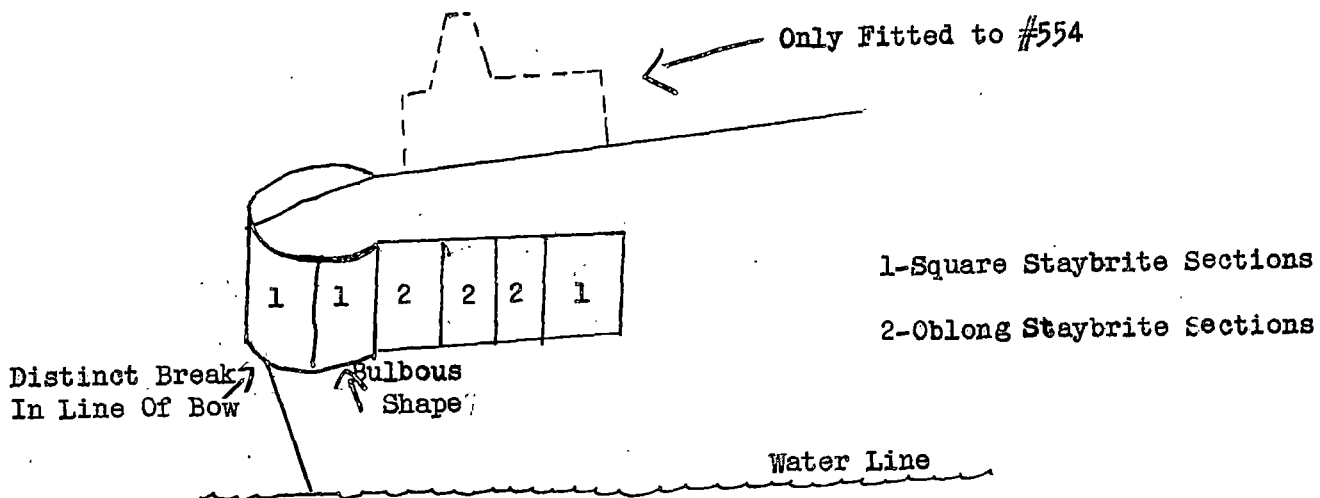
1. The Canadian Naval Attache made a trip to VIBORG, 7-8 June 1966.
2. The rail and highway overpasses on the Saimo canal are progressing and would appear able for completion in 1967. It would appear shipping with a mast height of at least 75 feet can pass through. It was again noted that roadside telephone (and other communications ?) were buried underground emerging at K 15 as 16 wires on newly erected poles (by army construction troops) and increasing to 24 wires at K 20, from the Finnish border.
3. One kilometer west of Viborg army personnel in fatigue uniform were carrying out field exercises and were using periscopes for observation. In Viborg 2 Poluchat (Border Guard) were alongside. At the commercial docks 3-1000T merships were loading lumber. At Viborg Shipyards only mership construction was seen. On the ways were 2 ships (possible UDA class tankers) and other construction was under way inside building sheds. Approaching Leningrad an OSA was seen under tow towards the harbour.
4. Leningrad: Smith's Embankment was interesting by the absence of familiar sights. Both the floating dock and "bathtub" structure have been removed
  - Pos 28 - Three door shed open - no visible marine construction. Scaffolding on walls suggests shed still under construction. Usual skinhead radar vessel along coffer dam.
  - Pos 29 - Vertical cylinder 15 feet high 12 feet diameter and canvas covered object some 10 feet high seen. A new green painted multi rib angle piece 10 feet long in each arm was on top of a low building in rear.
  - Pos 31 - Two Foxtrots under construction. Both bows clearly visible. A possible variant on their long range passive sonar array was observed. The bow of each and the third #554 at Pos 32 (which had Hercules and FEZ fitted) was as follows:

(see sketch on next page)

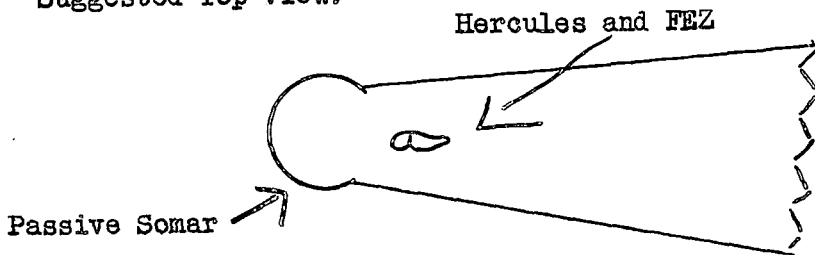
SECRET

(Topographical Intelligence  
Viborg, June 1966)

SECRET  
JIB(CAN) 12/66



Suggested Top View:



The sails of both were still rust or oxide colour. It is hazarded these two Foxtrots were those last seen in the floating dock. Another remote conclusion might be this is the end of the Foxtrot programme at Sudomekh.

Pos 32 - Foxtrot #554 in commission, newly painted with 3 white bands on w/t mast. This submarine has been sighted here before and could be returning for putting right post-commissioning defects.

Pos 33 - Hull 925 slowly progressing. Number on outboard hull is 0-5300

SECRET

(Topographical Intelligence  
Viborg, June 1966)

SECRET  
JIB(CAN) 12/66

Pos 44 - Tanker George Georgiu-Desa

Pos 46 - 3,000 T grey painted passenger ship appeared newly built -  
"Bolna"

Pos 13 - Tanker Guilio Antonia Meliac (no construction seen in inner  
Baltic Yard wharves.)

Evaluation:	A - 2	
Report & Date:	N-84/66 of	15 June 1966
Source:	CNA/Moscow	

SECRET

SECRET  
JIB(CAN) 12/66

VIII.

HUNGARY

PRODUCTION - Vehicles

OT 65, May 1966

1. The Canadian Military and Air Attache attended a film showing in PRAGUE, 30 May, during which a film on army training manoeuvres showed an OT65 in operation. (This was narrated in Czech.)
2. It was stated that this vehicle is produced in Hungary.

Evaluation: B - 2  
Report & Date: IR 20/66 of 31 May 66  
Source: CA&MA/Prague

SECRET

SECRET  
JTB(CAN) 12/66

IX.

HUNGARY

MISSILES - Rocket Bases  
Czechoclovakian Border Area, 1965

1. A Canadian source, visiting in Hungary, was arrested in November 1965 for "inciting against the State" and imprisoned for five months before deportation to Canada.

2. During his imprisonment at Vac, he came in contact with a former Hungarian, who was serving a sentence for spying. This person told the Canadian that there are 32 rocket bases in Hungary. However, the only location of missiles mentioned was at TATA, west of Budapest near the Czechoslovakian border.

Evaluation of Report:	F - 6
Date of Report:	6 July 66
Source:	Canadian of unknown re- liability

SECRET

SECRET  
JTB(CAN) 12/66

X.

U.S.S.R.

MISSILES - Facilities  
Moscow-Yaroslav Road,  
9 May 1966

Guided Missile Development Complex (TFP Serial 7)

1. Located at Kilometer 23, right-hand side of road Moscow-Yaroslavl, a new box-like concrete slab building was noted being constructed in area "B". No distinctive noises were heard nor particular activity noted. No military personnel were seen in the area.

Guided Missile Test Facility (TFP Serial 21)

2. At Kilometer 89.3, on the left hand side of the road, a guided missile test facility was noted. No distinctive noise was heard, no military activity was observed in the area (except for 1 SAF driving a civilian car south at Kilometer 91). A brief glimpse of the entire facility was obtained at Kilometer 90.8, but traffic was very thick. Several stacks and two cooling towers were noted.

Evaluation: A - 2  
Report & Date: A43/66 of 12 May 66  
M52/66 of 12 May 66  
Source: CMA & CAA?Moscow

SECRET



SECRET  
JIB(CAN) 12/66

XI.

U.S.S.R.

TOPOGRAPHICAL

Moscow-Yaroslavl Road  
Trip 9-10 May 1966

1. The Canadian Military and Air Attaches made a road trip to Moscow-Zagorsk-Yaroslavl, 9-10 May, during which the following observations were made.

TFP Serial (77/62)	Location	Observations
4	K17, LHS	<u>MYTISCHI AIRFIELD</u> - nothing seen to suggest airfield exists with possible exception of following item.
-	K19	Truck containing 25-30 shirt sleeved troops entered highway from road to W. One tunic seen had a light blue flash.
-	K22, RHS	Three tall pole masts supporting horizontal wires from which large ladder-like wires (extend?) about 1 km from road.
-	K26.9	Two power lines cross highway. Each consists of three circuits of three wires each. Each 3 wire circuit has 3 sets of 24 sheds.
-	K28, LHS	Antennae farm consisting of many 30-40 foot pole masts.
-	K30, LHS	<u>Pushkino Airfield.</u> Observed were 10 HARE/ HOUND (all believed to be HARE), 1 probable MAX and 3 small fuselages under canvas.
-	K42, RHS	Antenna farm - many pole masts. Area starts here and extends for several kilometers including item following.
-	K44-46, RHS	Complex of lattice towers.
-	K54.2, RHS	Communications van located just off highway surrounded by light wire fence.

SECRET

(Moscow/Yaroslavl Trip  
9-10 May 1966)

SECRET  
JIB(CAN) 12/66

<u>TFP</u> <u>Serial</u> <u>(77/62)</u>	<u>Locations</u>	<u>Observations</u>
13	K57.5, LHS	Possibly small military garrison but no activity. Surrounded by an old board fence and contains two 50 foot pole masts. Approximately 250 yards from road on top of a hill.
14	K63.5, RHS	No electronic equipment seen. Observed were four dark old wooden lattice towers of assorted shapes and a number of small dirty buildings.
15/16	K66.5, LHS	<u>Military Area.</u> No new construction observed. South end of area appears to contain married quarters. Ten 3-storey barrack-like buildings were counted in north end. There was no sign of activity either day.
17	K67.3, LHS	Long, narrow construction with pitched roof but without walls may house a gantry. It extends to the fence near the highway from a squat masonry building with one tall stack. Installation is partially obscured by trees but is in the military area. (Serial 13).
-	K70, LHS	COLT flying low about 1 km W of highway. Heading N - perhaps to land Zagorsk airfield.
-	Zagorsk	In town observed:  9 May - 15 - 5B (by monastery) 1 Pte Arty/Mag 2 SAF ( 1 junior officer) 2 u/i/Mk  10 May-- 90 02 XC 23 68 AE 18 57 KC 23 73 AE 36 13 OX 1 SAF EM 36 08 OX

SECRET

(Moscow/Yaroslavl  
Trip 9-10 May 66)

SECRET  
JIB(CAN) 12/66

TFP  
Serial  
(77/62)

19

Locations

K75.7, LHS

Observations

Zagorsk Airfield. No airfield or air indicators seen. Radars observed among roof tops were:

- 1 FLAT FACE
- 1 CROSS OUT W END BOX
- 1 SIDE NET (may have been - CAKE)

-

K79.2, LHS

Military garrison and soldiers observed marching inside: 4 u/i/Blk outside at bus stop. On 10 May a group of soldiers dismounted from a non-military truck in this area.

-

K78.5, LHS

New road to west. Two-lane, pre-cast concrete slab surface on fine base.

-

K80.5, RHS

A u/i/soldier/Black was standing on a cross road just E of highway.

-

K81.8, LHS

Concrete-slab road under construction, leading to red brick building.

20

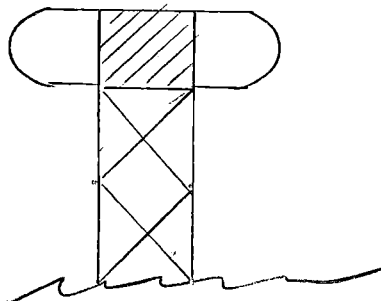
K86.5, RHS

U/I installation. No visible products. On 9 May a group of five soldiers were seen leaving by a gate in N wall. On 10 May observed bus 30 70 XB parked nearby and two soldiers in summer field service dress out front.

-

K88, RHS

Observed top of what appeared to be tall lattice tower several kilometers from highway. General appearance



SECRET

(Moscow/Yaroslavl Trip  
9-10 May 1966)

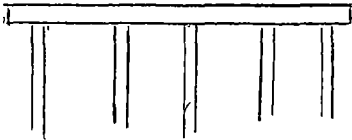
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JIB(CAN) 12/66

<u>TFP.</u> <u>Serial</u> <u>(77/62)</u>	<u>Locations</u>	<u>Observations</u>
-	K88, LHS	Road to west - with barrier
-	K97	A sign on the highway indicated a limit of 2.5 tons.
22	K97.5	There was no sign of a road to the E from K94 to K97. This item was a dirt (gravel) road crossing the highway with barriers either side of the main highway. These may have been hoof-and-mouth control barriers.
-	K101.5	New dirt road to W - vehicle ruts in trail to E.
-	K113	Hoof-and-mouth control point on highway. Manned by two militsia but not freshly laid. Notwithstanding that the epidemic apparently extended to this area, about twenty dairy herds of from 50 to 100 animals were seen along the route. The animals resembled holsteins and appeared in good condition.
-	K128.5, LHS	Road to NW with barrier and no-entry sign. Dirt surface and not heavily travelled.
-	K136, RHS	Military garrison
-	K136, LHS	Electronic installation:  3 Fork Rests 40-50 Comm Trucks Many pole masts
23	K138, LHS	Pereslavl Airfield. No aircraft on runway sighted.
-	Pereslavl	Many u/i/soldiers/Blk and several Kursants/Blk observed.
-	K142, RHS	Radar site contained:  2 FLAT FACE 1 STONE CAKE 1 possible DRY RACK

SECRET

(Moscow/Yaroslavl Trip  
9-10 May 1966)

SECRET  
JIB(CAN) 12/66

TFP Serial (77/62)	Locations	Observations
-	K170.8, RHS	New narrow gravel road to E.
-	K173.9	New concrete RR overpass erected. Embankments not yet completed but some track already laid. Appears to be single line.
-	K178.4, LHS	Black top road to W with barrier.
-	K180	Overhead bucket conveyor crosses highway. 9 May not working. 10 May, carrying what seemed to be gravel to a group of low buildings about 1 mile E of highway.
-	K189.5	Road bridge over electric railway. Length, 100-120 feet. One short centre span; two end spans. Reinforced concrete beam on reinforced concrete piers. Pier resembled:
		
-	K194.2, RHS	Dirt road to E with barrier.
-	K199, LHS	Vesna tower oriented roughly N-S
-	Rostov	Military barracks? Two storey building on RHS immediately S of Kremlin. On 9 May soldier armed with fixed bayonet patrolling along S side. On 10 May 4 soldiers were on street in front. Dirty central courtyard observed through apparently unguarded partly open gate.
-	K213	On LHS - militia post On RHS - dirt road with barrier leading E to large low building(s) with peaked roof.
-	K220, RHS	New construction at factory.

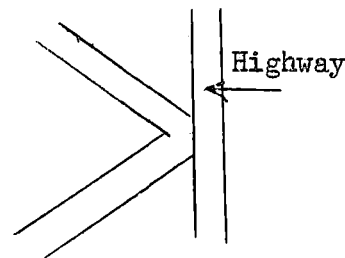
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(Moscow/Yaroslavl Trip  
9-10 May 1966)

SECRET  
JIB(CAN) 12/66

<u>TFP</u> <u>Serial</u> <u>(77/62)</u>	<u>Locations</u>	<u>Observations</u>
27	K220.6	Road bridge over river - 2 lane, single steel arch, length 90-100 feet.
-	K220.6, LHS	RR bridge over river.
-	K235.2	New 2 lane black-top road with barrier. Five-foot shoulders.
-	K239, RHS	Electronics site containing:  3 FORK RESTS 1 MERCURY GRASS 1 possible DISCONE on low building CAGED DIPOLES (Photography attempted)
-	K243, RHS	Electronics site containing:  3 FORT RESTS CAGED DIPOLES
-	K247, RHS	Tarmac road to E with barrier.
28	K253.5, LHS	<u>Refinery.</u> New unpainted 80-100 foot tower under construction.
-	K255, LHS	Two new roads being cut to meet highway as indicated.



29	K256, RHS	Road to E completed. Two-lane tarmac surface. Militia post located at junction.
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(Moscow/Yaroslavl Trip  
9-10 May 1966)

SECRET  
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TFP  
Serial  
(77/62)

Location

Observations

There are underground cables on each side of the highway which appear to extend continuously from the outskirts of Moscow to Yaroslavl. Not all marker posts are visible, however, it was noted that between two earth-covered bunkers posts were marked from 1 to 61 the interval estimated 250 meters. A sampling of markings produced the following:

a. a number over a horizontal line

e.g. 10

b. a number over parallel lines

e.g. 156

c. subsidiary posts with

⌒, ⌒, ⌒, ⌒ — but without numbers.

d. between another pair of bunkers the following, not necessarily consecutively -

$\frac{10}{91}$ ,  $\frac{05}{02}$ ,  $\frac{32}{17}$ ,  $\frac{31}{01}$ ,  $\frac{13}{17}$

Report & Date: { M52/66 and  
A43/66 of 12 May 1966  
Source: CMA/Moscow, CAA/Moscow

SECRET

SECRET  
JIB(CAN) 12/66

XII.

U.S.S.R.

SHIPPING - Merships

Visit, Motor Tanker, "KRIPTON"  
Halifax, 19-20 May 1966

1. The Soviet ship KRIPTON (callsign UURT) was in Halifax 12-20 May 1966.

Personalities

2. Both the Captain and First Mate claim to be Estonian by birth.

(a) Captain:	VICTOR TCHASOVITIN
Height:	5 ft. 7 in.
Weight:	150 lbs.
Hair:	blonde straight
Facial Features:	narrow face
Eyes:	brown
English:	fair
(b) First Mate:	KARL VELTS
English:	fairly good

Date of Report: 3 June 1966  
Source: DGI/INT S

SECRET



SECRET  
JIB(CAN) 12/66

XIII.

U.S.S.R.

SHIPPING - Fishing Fleet

Soviet Factory Trawler "BERYLL" (BMRT 379)

Halifax, 25 April - 5 May 1966

1. The Soviet Factory Trawler BERYLL (BMRT 379) (callsign UTJZ) arrived Halifax 25 April and departed 5 May 1966.

Personalities

Captain:	NICOLAY GRACHEV
Age:	42
Height:	5 ft. 2 in.
Weight:	180 lbs.
Hair:	Long, brown and wavy
Eyes:	Blue
Facial Features:	Square jaw
English:	Very little

Date of Report: 3 June 1966  
Source: DGI/INT S

SECRET

SECRET  
JIB(CAN) 12/66

XIV.

U.S.S.R.

SHIPPING - Electronic Reports  
Soviet Vessel "OLEGENORSK"  
Montreal, 19-26 April, 1966.

General

1. The Soviet merchant vessel, OLEGENORSK (callsign UHBS), a cargo ship of 3,725 tons visited Montreal, P.Q., from 19-21 April, 1966. Canadian Marconi installed VHF transceiver equipment aboard in order to satisfy Canadian Department of Transport regulations for vessels proceeding up the St. Lawrence Seaway. Canadian agents were MARCH Shipping Limited. The ship was constructed in East Germany, 1965.

2. The members of the ship's company were affable and co-operative. The Captain, 1st Mate and one of the radio officers spoke passable English, the latter being the most proficient. The ship had come from MURMANSK, had called at Le Havre and Quebec City prior to docking at Section 22, Montreal, and was going to visit Hamilton and Toronto prior to leaving the Seaway on the return voyage.

Personalities

3. On arrival at the ship source was conducted to the Captain's cabin, where he was met by the Captain who summoned the first Radio Officer (the Captain described him as the Radio Engineer). His name was RIBAKOV WLADIMIR. His ticket No. 421/R, 4 April, 1961, from ARCHANGEL. During the inspection the second operator was met, AFIMJN WLADIMIR, his ticket was No. 311/R of 26 April, 1958, also from ARCHANGEL.

4. Two officials, who said they were from the Soviet Embassy in Ottawa, arrived at about 10.30 to speak to the Captain. When the group accidentally bumped into source while enroute from the radio spaces, they were told that he was a Canadian Radio Inspector and the Soviet Embassy officials appeared not to give the matter a second thought, but continued talking to the Captain in Russian after briefly acknowledging him in English.

Antennas

5. The Radar was a DONETS II and was mounted on a special mast; there were two centre fed FLAT TOP MF/HF wire antennas between the two masts. One VHF dipole was affixed to the radar antenna pedestal. MF/DF loops were attached to the funnel and there was an MF whip.

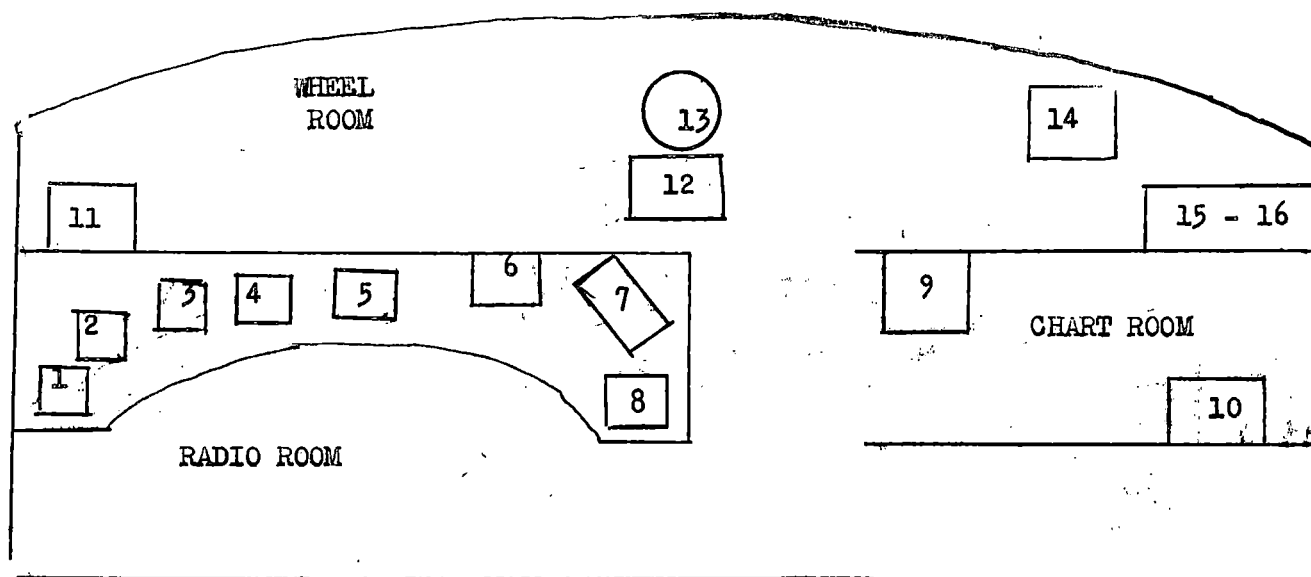
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(Electronic Report OLEGENORSK Cont'd)

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JIB(CAN) 12/66

Electronic Equipment

6. A sketch of the significant points of the wheel house, chart room and radio room is as follows:



- (1) Main Transmitter BLESNA-type, no date, serial No. 01000CB, power 250 watts, frequency range 410 - 512 Kc/s, power supply 220 volt AC 50 cycle. It was marked at the following frequencies: 410, 425, 468, 480 and 500 (circled) and 512, 454.
- (2) Main Receiver. VOLNA K, serial No. 1965 16107, frequency range 12 Kc/s - 23 Mc/s.
- (3) Emergency Receiver. PA 5 3, serial No. N531 1964R, frequency range 400 - 500 Kc/s.
- (4) Emergency Transmitter. ASP 4, serial No. BEC 301111965R, frequency range 410 - 512 Kc/s, power 60 watts.
- (5) HF Receiver. VOLNA K serial No. 1965 16051, frequency range 12 Kc/s - 23 Mc/s.

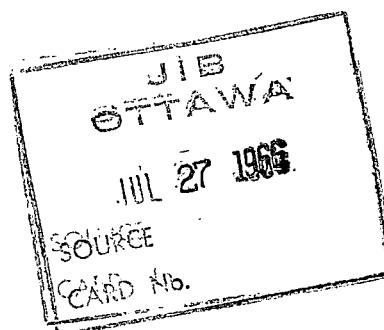
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(Electronic Report OLEGENORSK, Cont'd)

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JIB(CAN) 12/66

- (6) Auto-Alarm. APM 54B, serial No. 1611 1965R, frequency range 410 - 512 Kc/s.
- (7) Frequency Meter. HF frequency range.
- (8) HF Transmitter. BLESNA KV, serial No. 1204, frequency range 2,440 - 22,720 Kc/s, power 250 watts, power supply 220 volt AC.
- (9) MF/DF. ARP 5, serial No. 018190165, frequency range 186 - 376 and 375 - 750 Kc/s.
- (10) Auto-Keying. ADS B 17, serial No. 16771965R.
- (11) VHF Transceiver. AKACIA, serial No. 6505251965R, frequency range 100 - 140 Mc/s, power 60 watts, crystals in on four channels, 122-5, 132-0, 125-0, 126.2575 Mc/s.
- (12) Automatic Steering and Speed Control.
- (13) Binnacle
- (14) Radar Disply. DON 310831965 X-band
- (15 & 16) Canadian Marconi - temporary RT equipment for Seaway Passage.  
Lifeboat Apparatus, CHLUP, 1131963R, 500 Kc/s, 8,364 Kc/s, and 8,773 Kc/s.

SECRET



JIB CAN FOLDER

**SECRET**

CANUKUS EYES ONLY

Copy No 20

JIB(CAN) JIB(CAN) 13/66

DATE 21 June, 1966

# JOINT INTELLIGENCE BUREAU Ottawa

Communist Economic and Military Aid

Activities in the Underdeveloped Areas

May - 1966



JOINT INTELLIGENCE BUREAU

Department of National Defence

OTTAWA, CANADA

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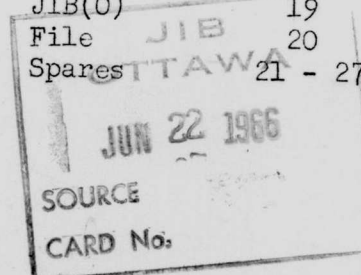
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Communist Economic and Military Aid  
Activities in the Underdeveloped Areas

May - 1965

Part I - Economic Activity

GENERAL

US Economic Aid to Middle East Countries in  
Fiscal Year 1965 and Cumulative Aid since 1946

1. The agency for International Development (AID) has published a statistical review of AID and non-AID assistance to Middle East countries during the fiscal year 1965 (July 64 - June 1965) and cumulative aid values since 1946.

Middle East	Aid	Food for Peace	Export/Import Bank Loans	Other	Total(Mil US\$)	Cumulative Total Aid since 1946
Iran	2.5	21.1	18.5	4.4	46.5	837.3
Iraq		6.4	-		6.4	52.6
Israel	20.0	33.9	4.0		57.9	1045.8
Jordan	39.6	2.5			42.1	473.6
Lebanon		.7			.7	79.7
Saudi Arabia		.8			.8	47.4
Syria		1.3			1.3	83.0
Turkey	149.8	48.2		3.0	201.0	2119.9
UAR	2.2	145.6			147.8	1080.9
Yemen	4.5	.3				39.1
TOTALS	218.8	280.8	22.5	7.4	506.3	5859.3 mil

2. Total US economic assistance to all countries in fiscal year 1965 amounted to \$4,895 million including \$2,025.7 million in AID assistance, \$1,526.7 million under the Food for Peace programme, \$771.5 million in long-term Export-Import Bank loans and \$571.2 million under other programmes. The Middle East share of the aid extended in fiscal year 1965 is 10.4 percent.

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- 2 -

SECRET  
CANUKUS EYES ONLY

JIB(CAN) 13/66

3. Turkey, with a total of \$2,119.9 million in aid extended since 1946, was the major Middle East recipient followed by the UAR and Israel. Iran and Jordan are other recipients of large-scale economic assistance.

4. Total US assistance to all countries since the start of the various aid programmes in 1946 and 1948 is reported to be valued at \$81.44 billion, including the massive initial aid to Western Europe: \$40 billion in AID and predecessor agencies assistance, \$13.2 billion in the Food for Peace programme, 9 billion in long-term Export-Import Bank loans and \$19.2 billion under other programmes. (UNCLASSIFIED)

### AFRICA

#### Cameroun

5. According to a recent news report from Yaounde the Soviet Union and Cameroun have concluded an economic and technical agreement under which the Soviet Union will finance the construction of a national agricultural school and a technical forestry school. The cost of these projects is estimated at \$4 million.

#### Nigeria

7. A Soviet delegation, including project experts, recently visited the Eastern Region of Nigeria in connection with a number of development projects to be undertaken with Soviet assistance. These include four hospitals with a total value of about \$20 million and an automobile assembly plant at Port Harcourt.

8. The terms under which these projects are being undertaken are unknown since a formal offer of credit has not been disclosed by the central or regional governments. However, there have been indications that the Soviet Union may have been contemplating some form of credit extension. Czechoslovakia and Poland have already provided loans valued at about \$42 million but there is no evidence that any loans extended have been utilized. (RESTRICTED)

#### Ghana

9. Ghana's new government is reported to have extended a contract under which it has agreed to import 1.3 million tons of Soviet crude oil. The oil contract was originally initiated by the Nkrumah regime and called for crude oil imports up to 1 million tons. The new deal probably reflects a desire on the part of the new government regime to utilize an outstanding Soviet credit and to preserve its foreign exchange. In addition, the government had previously announced that it intended to honour existing bilateral trade pacts and particularly wishes to ensure the continuance of large cocoa purchases by the Soviet Union. (CONFIDENTIAL)

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SECRET  
CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

JIB(CAN) 13/66

MIDDLE EAST

UAR

10. According to a report issued by the UAR General Industrial Authority the Soviet Union has participated in 72 industrial projects in the UAR under technical cooperation agreements concluded with the UAR in January, 1958 and September, 1964. The report states that 46 projects were completed under the 1958 agreement for which the Soviet Union provided a long-term loan valued at \$175 million and a further loan for \$40 million in 1963. The 1964 loan, valued at about \$280 million, was extended for use in the development of the UAR's heavy industry. (UNCLASSIFIED)

11. A French economic delegation visiting the UAR in April, 1965 examined some proposed UAR development projects with a view to participating in their construction. One of the projects examined was the construction of a steel plant at Aswan in association with Czechoslovakia. (UNCLASSIFIED)

12. Credit facilities for the project up to a value of \$40 million would be provided in equal shares by both countries. A Czech economic delegation was also in Cairo to complete the necessary trip-artite agreement. If an agreement is finalized it will be the first time that France has joined with a communist country in providing aid to a less-developed country. (UNCLASSIFIED)

13. The Soviet Union is reported to have agreed to reduce by about 25 percent the cost of some of the equipment it is providing for the UAR's Aswan High Dam. The reduction reportedly represents a saving of about \$30 million and apparently was agreed upon during Kosygin's recent visit to the UAR. (UNCLASSIFIED)

14. A joint UAR/Soviet committee has drafted the final report on the construction of a new harbour at Damietta, the cost of which is estimated at about \$13 million. The site of the harbour and plans for a railway line connecting it with the town have been approved and construction is to start in July, 1966. (RESTRICTED)

15. Under an agreement concluded on 18 May, 1965 the UAR has agreed to export 124,725 tons of rice to the Soviet Union. About 60,000 tons will be delivered this year and the balance from the 1966-67 crop. (UNCLASSIFIED)

15. T The UAR and Communist China have signed a trade agreement for 1966-67 providing for trade exchanges valued at \$84 million compared with \$42 million in 1965. The UAR will export cotton, rayon and phosphates in exchange for Chinese tea, meat, sugar and tin.

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SECRET  
CANUKUS EYES ONLY

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- 4 -

SECRET  
CANUKUS EYES ONLY

JIB(CAN) 13/66

Syria

17. The Syrian Minister of Economy has announced the Syrian Five Year Economic Development Plan will be reconsidered to give priority to the Euphrates Dam. Projects associated with the dam are also to be given priority. These are a plant producing steel bars, expansion of the cement industry and the building of a cement plant at Rikka near the Dam's site.

18. Under an agreement signed in Damascus on 5 May, 1966 Roumania is to supply Syria with 100,000 tons of diesel oil at \$17.5 per ton. It is believed that part-payment for the oil will be made in Syrian tobacco. Syria is reported to have had preliminary discussions with Roumania and Poland concerning the establishment of a phosphate fertilizer plant. (UNCLASSIFIED)

Yemen

19. A protocol to the 1964 aid agreement between Yemen and Communist China was signed in Sana recently. It provides for the construction of a hospital, a technical school and printing establishment. A Chinese delegation visiting Yemen has announced that the school will be a gift. China has also agreed to send a medical mission to Yemen and will award scholarships to Yemenis to study at Chinese Universities and technical institutions. (UNCLASSIFIED)

ASIA

India

20. Recent high level talks between India and Czechoslovakia, Poland and East Germany appear to have strengthened economic, and especially industrial relations between these countries. A joint Czech-Indian Committee for Economic Cooperation and Trade is to study methods of industrial collaboration between the two countries. Other agreements on culture and nuclear cooperation are to be concluded soon.

21. A Polish-Indian trade protocol for 1966 was signed recently and an agreement on technical cooperation between Polish and Indian organizations was also concluded. The latter agreement dealt largely with cooperation in the field of shipbuilding, chemicals and engineering and is the first agreement of this kind to be signed by Poland with a developing country.

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SECRET  
CANUKUS EYES ONLY

SECRET  
CANUKUS EYES ONLY

JIB(CAN) 13/66

22. Apart from trade negotiations for 1966, East German - Indian discussions included the possibilities for cooperation on a contractual basis. The establishment of a mixed trade and economic commission was also discussed. (UNCLASSIFIED)

Singapore and Malaysia

23. It is reported that Chinese purchases of Malaysian rubber began to fall off at the end of February or early in March, 1966 and although Soviet purchases of rubber from Singapore and Malaysia have been increasing (67,000 tons in the first three months of 1966) it is believed in Singapore that Soviet purchases are unlikely to offset the loss of Chinese purchases. Up to the present time there are no indications concerning China's future rubber purchases but in view of its break in relations with Indonesia it is unlikely to purchase Indonesian rubber. However, Ceylon apparently has agreed to supply China with 41,000 tons this year. (SECRET)

Indonesia

24. On 18 April, the Chinese Communist government informed the Indonesians that events of the September, 1965 coup had destroyed the basis of economic cooperation between the two countries and that it was withdrawing its technical personnel and financial assistance from the construction of a textile mill. A few days later Indonesian deputy premier Malik confirmed that, in effect the Chinese had terminated all cooperation and trade agreements including shipping contracts. The September, 1965 agreement under which China agreed to provide a \$100 million credit in cash, commodities and long-term credit and an earlier loan agreement valued at \$30 million are now considered to have been cancelled. It is not known how much of the 1965 loan for \$100 million was drawn, apart from \$10 million in foreign currency granted last year. (CONFIDENTIAL)

LATIN AMERICA

Argentina

25. Argentina intends to send an economic mission to the communist countries in the near future to explore the possibilities of increasing trade, especially Argentine exports. The present objective is not to reactivate cancelled barter agreements but rather to attempt to trade for hard currency. (UNCLASSIFIED)

Cuba

26. Despite the dispute between Cuba and Communist China concerning the future level of trade between them, Communist China has agreed to  
/deliver

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SECRET  
CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

JIB(CAN) 13/66

deliver the 135,000 tons of rice agreed upon as the whole year's exports in the first half of 1966. At least 40,000 tons were delivered in the first quarter of 1966 and 60,000 tons have been promised for the second quarter. This means that Cuba has likely earmarked about 600,000 tons of sugar for delivery to China this year in payment for the rice. (UNCLASSIFIED)

Guyana

27. The prime minister of the new state of Guyana announced on May 28, 1966 that the Soviet Union had offered its support for the economic development of Guyana. The offer is reported to have been made by the Soviet Ambassador to Brazil who represented his country during the independence ceremony. (UNCLASSIFIED)

Chile

28. According to a US report a Soviet technical delegation is spending the next two months in Chile surveying a wide range of potential economic aid projects with particular emphasis given to Soviet aid for Chile's copper mining and fishing industries. During a recent visit to Moscow by a Chilean government official a credit ranging in value from \$60-\$100 million is reported to have been mentioned but this has not been confirmed. Chile and the Soviet Union have each displayed considerable interest in expanding their economic relations on a number of occasions in the past but on each occasion have failed to conclude an agreement.

29. A similar situation developed during the most recent discussions when negotiations reportedly foundered on Soviet insistence for most-favoured-nation treatment and their desire to purchase copper and nitrates instead of Chilean fruit, hides and manufactured goods.

(CONFIDENTIAL)

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CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

JIB(CAN) 13/66

PART II - MILITARY AID

AFRICA

Algeria

30. It is estimated that over 600 Soviet military personnel are in Algeria, including 300 army, between 250 and 300 air force, and 55 from the navy, including a team carrying out a survey for an Algerian naval academy. (CONFIDENTIAL)

Somalia

31. About 115 army, 65 air force and a few naval personnel are reported to have returned recently to Somalia after receiving military training in the Soviet Union. An estimated 250 Somali military personnel are still in the USSR undergoing training. (SECRET)

Tanzania

32. During a recent visit to Tanzania Soviet deputy foreign minister Malik is reported to have agreed to supply Tanzania with six additional patrol boats under its military aid agreement. The Tanzanian navy now consists of four small patrol boats from the USSR and East Germany. Communist China is also reported to have offered Tanzania naval craft. (SECRET)

MIDDLE EAST

UAR

33. Although the joint communique issued at the end of the Kosygin visit to the UAR (10-18 May) made no mention of military aid, as the deputy chairman of the State Committee for Foreign Economic Relations (GKES) for military affairs was a member of the delegation it is very likely that the subject was among those discussed. (CONFIDENTIAL)

ASIA

India

34. Perhaps as many as 100 of the large order of 260 tanks (including 225 T-54A's) from Czechoslovakia may have arrived in India on three Indian ships in February. DIS London believes that all may be delivered by August of this year. (SECRET - CANUKUS ONLY)

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SECRET  
CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

JIB(CAN) 13/66

Pakistan

35. The British Defence Intelligence Staff estimates that as of 31 May the following Chinese military equipment may have been delivered to Pakistan:

MIG-19/FARMER - 20 to 24 (possibly 50 in all will be delivered)

T-59 tanks - possibly 80

T-34 tanks - possibly 20 (eight have been seen)

37 mm AA guns and 14.5 mm quad AA machine guns - quantity  
not known

75 mm recoilless anti-tank guns,  
60 mm mortars, 40 mm rocket launchers, 7.62 mm rifles,  
and other small arms-sufficient to equip one division.

Field artillery and howitzers also reported but not identified -  
possibly enough for one division. (SECRET-CANUKUS EYES ONLY)

SECRET  
CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

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TABLE I  
Communist Economic Aid Extensions  
1 January - 31 May 1966

By	To	(Million \$US)		Total
		Project Aid	Other Loans	
Soviet Union	Cameroun	7.7		7.7
	Iran	290.0		290.0
	Pakistan	20.0		20.0
	Syria	140.0		140.0
	* Turkey	<u>33.0</u>	<u>      </u>	<u>33.0</u>
		490.7		490.7
Czechoslovakia	Pakistan	<u>70.0</u>	<u>      </u>	<u>70.0</u>
		70.0		70.0
Hungary	India	<u>52.5</u>	<u>      </u>	<u>52.5</u>
		52.5		52.5
Bulgaria	Syria	<u>15.0</u>	<u>      </u>	<u>15.0</u>
		15.0		15.0
	TOTAL	<u>628.2</u>	<u>      </u>	<u>628.2</u>

\* The value of the Soviet loan to Turkey in 1965 has been revised upward to \$200 million, an increase of \$33 million.

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CANUKUS EYES ONLY

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DATE 22 June, 1966

# JOINT INTELLIGENCE BUREAU

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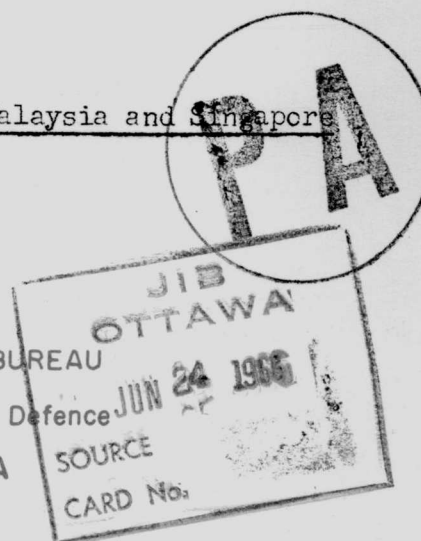
The Economic Situation in Indonesia, Malaysia and Singapore

May, 1966

JOINT INTELLIGENCE BUREAU

Department of National Defence

OTTAWA, CANADA



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The Economic Situation in Indonesia, Malaysia and Singapore

May, 1966

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The Economic Situation in Indonesia, Malaysia and Singapore

May, 1966

Object:

1. To review the economic situation as of 1 May 1966 in Indonesia, Malaysia and Singapore, and to consider the future economic trends in these countries.

INDONESIA

Current Economic Situation

2. Since September, 1965, economic deterioration has continued, the monetized sector of the economy has broken down and economic discontent has lead to frequent and vigorous demonstrations. An indication of the present chaotic state of the Indonesian economy was given by the Sultan of Jogjakarta, Vice Premier for Economic, Financial and Development Affairs in the revised cabinet, in a statement on 12 April, 1966, when he observed that:

- (a) Indonesia's burcaucracy was too large
- (b) Inflation had got out of hand. Prices in 1965 rose by 500 per cent and unless checked, may increase by 1,000 per cent in 1966
- (c) The budget deficit in 1965 rose to 300 per cent of government revenue, and between January and March of 1966 the deficit was nearly as large as all government expenditures in 1965.
- (d) Exports were still falling
- (e) Repayment of long term debts falling due would leave no foreign exchange to finance routine expenses
- (f) Corruption, mismanagement and misadministration existed

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3. In an attempt to deal with this situation the government has had to administer the economy on an ad hoc basis. The 1966 Budget which optimistically looks for a surplus, is most unrealistic and has already had to be altered by decree. In December 1965 there was a half-hearted attempt to halt the inflationary spiral with the re-evaluation of the rupiah on the basis of 1 new rupiah to 1,000 old. The result was a rush on such scarce commodities as rice and cloth. Rice, for example, rose in price from 2 to 6 new rupiahs per litre within the last five months - a 200 per cent increase.

4. Rice production has generally kept pace with the increase in population, as indicated by the fact that average imports of rice over the last eight years have amounted to less than one million tons per year. However, as a result of inadequate procurement and distribution policies there have been serious shortages in certain urban areas. The shortages have also been a reflection of an unstable currency and exceptionally high priced consumer goods. In such a situation the farmers hang on to their potentially valuable surpluses and the merchants hoard in expectation of still higher prices, or until new supplies are available to replenish their stocks.

5. The government has been unable to buy up sufficient reserves internally to force the price of rice down and has had to contract for rice from the United States, Thailand, Burma, Japan and Pakistan to meet the need in the urban centres. It is by no means certain that such imports will arrive in time to prevent urban food crises before the peak of the next harvest in June, or that they will result in a curtailment of rising rice prices.

6. By the end of 1965 Indonesia's foreign indebtedness amounted to some \$2.5 billion of which more than half is owed to the Soviet Bloc. As of late January Indonesia had defaulted on repayments to the extent of \$162 million, comprising \$116 million in long and medium term debts, \$35 million on short-term debts and \$11 million on commercial cash transactions. The result is that Indonesia's credit rating has dropped to zero and imports have fallen off dramatically. A lack of raw material and spare parts has seriously affected industrial production and in some sectors, such as the textile industry, production has all but ceased.

#### Future Trends

7. Although there have been repeated attempts at economic reform they have not been sufficiently intensive or extensive to be of much value. Indonesian authorities have recently announced that no long-term development plan will be drawn up at present but that the government's efforts will be concentrated on a short-term programme of six to twelve months. However, no details of such a programme have yet been announced.

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The task requires in part a broad internal programme, which is within the country's capacity, and includes:

- (a) Centralized control over the Ministries
- (b) A more effective revenue raising and collection system
- (c) Better food procurement and distribution
- (d) The imposition of fiscal austerity, especially in military expenditure
- (e) Reform of the exchange rate structure
- (f) Measures to stamp out widespread corruption both in and out of government.

8. While the above measures might bring about a temporary halt in the declining economy any kind of a sustained recovery will necessitate substantial foreign aid and a moratorium, for at least several years, on long and medium term debts. As of 1 May 1966, just over \$12 million of various forms of aid have been offered which include \$6 $\frac{1}{2}$  million from the United States, \$3 million from Britain, \$2 million from Japan and one-quarter of a million dollars from Australia. While this aid is significant in terms of Indonesia's urgent immediate needs, in terms of overall quantity it is too small to have other than a very limited effect. Prospects for further aid on a scale more in keeping with Indonesia's requirements are likely, only if the government is prepared to introduce some radical changes in foreign and domestic policies. Even allowing for Indonesia's relatively rich natural resources and assuming a degree of internal stability and a modest amount of international cooperation, Indonesia faces a formidable task if she is to revive her economy to the level of past years.

#### Foreign Economic Policy

9. Indonesian exports, including petroleum, amounted to approximately \$550 million in 1965, a slight decrease from 1964. The fall in exports was partly accounted for by a lack of spare parts which in some cases brought industry to a standstill. This in turn was a result of limited imports restricted by a shortage of foreign exchange. For the present, imports are only likely to increase from those countries willing to extend credit such as Japan, West Germany and the Netherlands, but even these countries are noticeably reluctant to go too far as illustrated by Japan's temporary suspension of export insurance arrangements pending evidence of a degree of political and economic stability.

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10. Prospects for Indonesia's big foreign exchange earners (rubber, tin and oil) are mixed. Rubber prices have remained firm and in 1965 production rose slightly to an estimated 670,000 tons. There is, however, little hope that the rising trend will be maintained because of the ever increasing demand for synthetic rubber. Tin production in 1965 was estimated at about 15,000 tons, a decrease of some 1,000 tons from 1964. Although tin prices have remained fairly high, unless spare parts for the industry are received, production will fall still further and export earnings in 1966 will drop accordingly. Oil and petroleum products earn Indonesia about \$100 million annually in foreign exchange. Production in 1965, estimated at 24 million tons, saw no increase over 1964. However, recent discoveries indicate production may rise in 1966.

11. Since it is unlikely that foreign exchange earnings will rise appreciably over the next five years, Indonesia's future well-being depends a great deal on the extent to which the international community is willing to step in and help. Indonesia is at the present appealing for aid, attempting to reschedule certain debts and negotiating for resumption of credit. Japan is playing a leading role in encouraging a conference of creditor nations to study and act together on Indonesia's aid requirements. It is, however, too early to even predict which countries might eventually participate in such a scheme.

12. Indonesia's poor aid prospects would be considerably improved by responsible economic behaviour, especially if accompanied by an easing of her policy of confrontation, and by assurances to creditor nations that debt commitments although at present beyond Indonesia's repayment capacity, would not be repudiated.

13. Indonesia's and Singapore's mutual desire to reopen the traditional barter trade between the two countries has caused a great deal of confusion and bitterness between Singapore and Malaysia. Ostensibly, this opposition has arisen out of Malaysia's fear that such an action would bring confrontation to its doorstep. Nevertheless, it is highly probable that barter trade will increase substantially, although it is doubtful if it will ever reach the \$75 to \$100 million a year level which preceded confrontation.

#### MALAYSIA

##### Current Economic Situation

14. The Separation Agreement of 9 August, 1965 provided for the establishment of Singapore as an independent and sovereign state outside Malaysia and among other measures provided for "cooperation in economic affairs including the setting up of joint bodies". However, very little

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effective economic cooperation has resulted from this agreement. In an attempt to express their independence, the leaders of both countries have initiated actions that can only be harmful to the economic well-being of their respective states. Despite this, there has been no development that would indicate that the future well-being of either state lies other than in mutual cooperation. Singapore depends on Malaysia's trade and markets and Malaysia needs Singapore to handle its trade in rubber and tin; neither country stands to gain economically by disruptive unilateral actions.

15. The Malaysian economy is based essentially on the production of primary products, mainly agricultural, although an increasingly wide range of secondary industries is being established. The major source of foreign exchange is derived from the production and export of rubber and tin which alone accounts for about three-quarters of Malaysia's total income from exports. Other important exports include oil, iron ore, bauxite, palm oil and pineapples. To this Sabah contributes timber, followed by rubber and copra while Sarawak exports rubber, pepper and timber.

16. Agricultural production, particularly in rice, has not kept pace with the population growth. As a result Malaysia has had to import over 300,000 tons of rice annually at a cost of \$33 million in foreign exchange. To help alleviate the situation, the World Bank announced in mid-November, 1965, a \$45 million loan towards the Muda River irrigation project which, it is hoped, will increase rice production sufficiently to sharply reduce the present reliance on imports.

17. Industrial development and diversification is being encouraged by the Government with the emphasis in such areas as shipbuilding, spinning and weaving mills, oil refineries, automobile assembly plants and cement and rubber tire plants. It is envisaged, that by developing these industries Malaysia's economic dependence on rubber and tin will be reduced.

18. Signs of inflation are evident in the rising costs of imports, rising expenditure on defence, and an increased budget deficit expected in 1966. Tariffs too, are responsible for the increase in prices of a wide range of goods. The Malaysian Minister of Commerce and Industry has warned that, if necessary, he will invoke the Supply Act of 1961 to curb inflationary price increases. This act allows for governmental inspection of stocks, prices, accounts and business documents.

19. Despite the inflationary trend, the expense of confrontation and lack of economic cooperation with Singapore, Malaysia continues to enjoy one of the highest standards of living in Asia today.

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### Future Economic Trends

20. The first all Malaysian Five-Year Plan (1966-70) was published in December. The emphasis is on programmes and projects which will raise the country's output and individual incomes. Particular attention is being paid to education and agriculture, the latter is currently the country's most important source of employment. The Government has estimated that if the plan's targets are achieved, some 460,000 new jobs would be created, including 80,000 in Sabah and Sarawak, and the average income in Malaysia should rise by over 5 per cent.

21. The Malaysian Five-Year Plan appears basically sound assuming that foreign aid will be forthcoming and the necessary budgetary surpluses can be obtained. This means, however, that the Government will have to create a certain degree of confidence in foreign investors which in turn will depend on the extent to which Malaysia is prepared to cooperate with Singapore.

22. The next five years should see Malaysia approaching self-sufficiency in rice with the scheduled completion of the Kuala Muda irrigation scheme in 1969. On the darker side, inflationary signs are appearing with the rising costs of imports, rising expenditures on defence, and an increased budget deficit expected in 1966. In addition, the long-term prospects for rubber and tin are expected to be unfavourable, a factor which will likely encourage a greater emphasis on manufactured goods.

23. It is questionable, however, whether Malaysia will be able to sustain the present industrial momentum over the next five years let alone increase the investment unless, of course, steps are taken to inaugurate a wider common market. With both Malaysia and Singapore entering difficult financial periods, much in the next five years will depend on the amount of cooperation between them to reduce the trade barriers that presently exist.

### SINGAPORE

### Current Economic Situation

24. One of the basic reasons for Singapore's previous merger with Malaysia was to take advantage of a regional common market. Even at the time of separation there was a possibility that this might be achieved, but at present such prospects are dim. Malaysia, for its part, has taken steps towards the establishment of its own common market, for the present excluding Singapore and leaving it no alternative but to pay the duties and/or to seek new markets elsewhere. Even assuming new markets can be readily found economic growth will be slower than it might have been had Singapore been able to participate freely in a Malaysian common market.

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25. Devoid of natural resources, Singapore's economy is tied to industrialization and entrepôt activities. That the government is conscious of this fact and the resulting need to attract new industry, is illustrated by the 1966 budget which allows for a whole range of incentives to local manufacturers in respect to local manufacturers in respect to expenditures on the development of overseas markets and also higher rates of depreciation for industries producing for export. Investment from abroad is also being encouraged but with the present uncertainties of the region the establishment of new enterprises has been slow.

26. Despite the emphasis, manufacturing is still a relatively small contributor to the economy, averaging just under 9 per cent of the GNP over the last few years. The annual rate of growth of the manufacturing industry, however, is over 15 per cent which indicates a gradual shift away from traditional entrepôt activities. Nevertheless, entrepôt trade remains the key to Singapore's economic well-being representing as it does some 75 per cent of its total trade and employing nearly 12 per cent of Singapore's labor force.

27. Unemployment and a need for new export markets are the most urgent problems confronting Singapore today. Since the former is a result of the latter, Singapore is concentrating its efforts on new markets by sending trade missions to the developing countries of Africa and Asia, the Iron Curtain countries, the BANZ group, the United States and China. It is questionable, however, whether Singapore will achieve early success since it will face such competitors as Hong Kong, Japan, Taiwan and other Asian countries who are already established in those areas.

28. The British military base is yet another mainstay of the Singapore economy contributing an annual \$150 million. The loss of the base, for whatever reason, would be a serious blow to the economy.

#### Future Economic Trends

29. In December 1965 the first details were made available on Singapore's Second Five-Year Plan, (1966-70) but the Plan has not yet been published. Public expenditure is expected to be \$500 million and private expenditure around \$415 million. Of the public expenditure 60 per cent is to be for economic development and 32 per cent for social development. The success of the plan will to a large extent depend upon the degree of economic cooperation between Singapore and Malaysia and failing this, the ability of Singapore to obtain alternate foreign markets for its manufactured products.

30. It seems likely that Singapore will remain for some time to come the major entrepôt for the peninsula since alternative port services could not be provided without expenditure beyond the present capacity of Malaysia. However, it is unlikely that Singapore will be able to regain

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its previous dominant position as an entrepôt. The entrepôt trade is expected to grow an estimated 2 per cent per year over the next five years. If trade with Indonesia is resumed there could be a sharp but temporary increase.

31. Considering past performances, the government's awareness of the necessity to export, the experience of Singapore traders and their contacts in foreign markets, the incentives offered to investors and industrialists by the government, and the efforts being made to encourage trading relations, it seems likely that Singapore will have the capability and take the steps necessary to compete in world markets and that exports will continue to rise at a good rate in the future.

32. If Singapore and Malaysia progress towards closer economic cooperation, which would be greatly to the advantage of both, the prospects for more rapid economic expansion over the next five years will increase accordingly.

#### MALAYSIA - SINGAPORE

##### Foreign Economic Policy

33. The foreign economic policies of Malaysia and Singapore, until just recently, were so complementary that they could be examined together. However, with the exclusion of Singapore from the Malaysian Common Market, Singapore has taken the stand that its doors were now open to "any country willing to trade on the basis of mutual benefit". Two of the more obvious responses to this offer have come in the form of: (a) a visit to Singapore by a USSR trade delegation and (b) a statement from Indonesia suggesting re-examination of their trade relations. Malaysia objected violently to the latter. Since Singapore recognizes that trade with Malaysia is of much greater importance than any conceivable level of restored trade with Indonesia and since Malaysia is in a position to virtually cripple Singapore's economy, the matter has, for the present, been allowed to rest.

34. Prospects for the big foreign exchange earners (rubber and tin) are, as in the case with Indonesia, mixed. Rubber prices have remained constant and exports in 1965 from Malaysia and Singapore increased by 4.3 per cent to over 1 million tons. Future rubber production is sure to expand but it is doubtful whether the increase will compensate for falling prices expected in the future as a result of an increasing demand for synthetic rubber. Tin prices remain high and production too has reached an all-time-high but it is becoming increasingly difficult to raise output because of the depletion of rich reserves. Not only have many poor grade mines been opened, but the labor force has had to be increased by 22 per cent while production increased by only 4 per cent. Timber exports were up 20 per cent in 1965 and it is now the third export product behind rubber and tin.

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35. The United States was the largest importer of Malaysian produce in 1965 taking about one-quarter of all exports. Next in line were Japan, U.K. and USSR. Increased attention is now being paid to Africa as a source of new markets and raw materials.

36. The considerable incentives offered by Malaysia and Singapore to attract industry and foreign investment can hardly fail to have some success, but with a greater degree of collaboration between the two countries, the prospects would be greatly enhanced.

#### USSR's ROLE IN THE AREA

##### Soviet Interests and Current Role

37. Soviet interests in Indonesia have been predominantly in the field of military aid, and attempts made in the area of economic assistance have been largely unsuccessful. As long ago as 1956, Indonesia accepted an economic credit from the USSR for \$100 million and this was increased by a further \$250 million in 1960. The loans were intended to assist in the industrial expansion of Indonesia and were earmarked for such projects as steel and chemical plants, a hydroelectric development and several smaller undertakings. However, the inability of the Indonesians to provide the local cost element of these projects has led to the postponement of most of them and it seems doubtful that they will come to fruition in the near future.

38. We are aware of no Soviet aid to Malaysia but an agreement has recently been concluded (April, 1966) between the USSR and Singapore, under which the former will provide technical and economic assistance for the industrial development programme.

39. Trade statistics are not available for 1965 but in the previous year, Indonesia's trade with the USSR amounted to some \$72 million, while Malaysia/Singapore trade (at that time treated as a combined figure) amounted to some \$74 million, consisting chiefly of rubber exports.

40. In the field of military aid, Indonesia has been one of the two largest recipients of Soviet attentions (the other being the UAR). Thus, it is estimated that to the end of 1965, some \$1.4 billion worth of arms, before discount, had been contracted for by Indonesia. These include a wide range of equipment, from jet medium bombers and air-to-surface missiles to large quantities of small arms.

41. Inevitably, given the state of the Indonesian economy, deliveries of this volume have resulted in heavy financial indebtedness and repeated defaults on repayments, despite concessions made by the USSR. At the end of 1964, Indonesia was responsible for nearly half the outstanding indebtedness, for Soviet military aid, of all the underdeveloped countries.

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### Likely Future Role

42. In Indonesia, the USSR seems likely to consider that the rejection of the Chinese communists and the diminution of Sukarno's influence will enhance her position. In consequence, despite the bad financial record of the past, the Soviet Union will probably continue to extend both military and economic aid and to make what readjustments are necessary to enable the Indonesians to cope with their burden of debt. The level of such aid will depend to some extent on political relationships between the USSR and Indonesia. It seems likely that experience with economic aid to the Indonesians will cause the USSR to be cautious in extending further substantial aid. Though the new Indonesian leadership may wish to establish a better balance between the communist world and the West, their heavy indebtedness and the dependence of their armed forces on Soviet equipment and spares, would make it extremely difficult to effect any dramatic switch. Assistance with maintenance of present equipment will doubtless continue and should Indonesia attempt to reach new arms supply agreements with the Soviet Union, the latter would probably comply.

43. In Singapore and Malaysia, we do not envisage any great change in the existing relationship with the USSR, though trade between both these areas and the Soviet Union will probably grow slightly. It seems improbable that economic or military aid offers, even if made to the Malaysian government, would be accepted lest they jeopardize Western contacts. In the case of Singapore, we believe that more economic aid might be acceptable from the USSR but that in the foreseeable future, there is no prospect of Soviet economic dominance of this country.

### COMMUNIST CHINA's ROLE IN THE AREA

#### Chinese Interests and Current Role

44. Since 1957, Communist China has extended a total of about \$100 million in economic aid to Indonesia and a possible \$50 million in addition was under consideration when the coup of September, 1965 took place. Recently, and as a direct result of the expulsion of Chinese diplomatic and technical personnel from Indonesia, the Chinese have issued a statement formally terminating their aid programme in that country.

45. There is no evidence of Chinese economic aid offers to either Malaysia or Singapore.

46. Chinese trade with Indonesia reached a value of \$104 million, some \$65 million of which consisted of imports, which were mainly raw materials, piece goods and rice. Rubber made up the bulk of Indonesia's exports. The combined Malaysia/Singapore trade with China in 1964 reached a total of \$100 million, all but a half million of which consisted of imports from China. This imbalance was somewhat rectified in 1965 by increased rubber purchases on the part of China.

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47. Chinese military aid in the area has been non-existent in the case of Malaysia/Singapore and only slight with respect to Indonesia. There were some signs of negotiation in this field prior to the September coup, the first for some years, but events since then have, of course, brought this to a halt.

Likely Future Role

48. In Indonesia, so long as the present leadership remains, it does not seem probable that the Chinese economic influence will be restored to any great extent. Especially in the fields of economic and military aid, there seems little likelihood that China will be willing to grant or Indonesia to accept assistance for the next few years. According to a statement by Malik, trade has also been suspended but it is believed that it is likely to be restored with future trade commitments made on a basis of mutual advantage.

49. An economic intrusion into Singapore would presumably be valuable politically to the Chinese and they may be expected to take advantage of any opportunities to increase their present foothold in this country. However, the Singapore government seems unlikely to jeopardize its international relationships by too great a dependence on Communist China for either economic or military aid. Trade between the two countries is not likely to show considerable change in the next five years.

50. Similarly, Malaysia's present western orientation is likely to make her resistant to Chinese offers of aid and in the present circumstances, China is unlikely to see much advantage to be gained from aid extensions. Trade between the two countries is likely to continue at its present level.

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DATE 18 July, 1966

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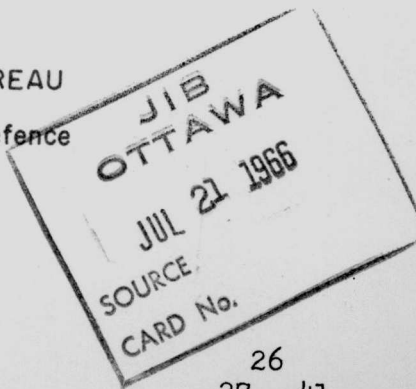
## Ottawa



### THE GROWTH OF THE SOVIET MERCHANT FLEET

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## THE GROWTH OF THE SOVIET MERCHANT FLEET

### Growth of Soviet Seaborne Foreign Trade

1. The seaborne foreign trade of the USSR has expanded rapidly since 1958 and by 1963 had reached 6.4% of the world total. It is planned that it will rise to 8.2% of the world total by 1966 and 11% by 1970. Trade with other Communist countries makes up the larger part of this trade; however, during the period 1959 - 1961 trade with the free world rose by some 70% while trade with Communist countries remained relatively unchanged. This trend is expected to continue although at a much reduced rate and in future the major part of the increase in seaborne Soviet trade will probably be with free world countries possibly at a annual rate of increase of between 5% and 7%.

2. In 1958 Soviet seaborne foreign trade totalled approximately 29,400,000 tons of which 16,100,000 tons or 55% was carried in Soviet ships and 13,300,000 tons or 45% was carried in foreign ships. By 1964 Soviet seaborne trade had more than tripled to reach to 92,000,000 tons of which 44,600,000 tons or 48% was carried in Soviet ships and 48,000,000 tons or 52% in foreign ships.

3. During this period the growth of seaborne foreign trade expanded much more sharply than that Russian planners foresaw, primarily as a result of the sudden requirement to supply Cuba largely in Soviet ships and the rapid growth of foreign trade including the arms trade particularly with the Middle East, Indonesia, India and West Africa.

4. If it is assumed that Soviet seaborne foreign trade will increase between 5% to 7% annually in the six years from 1964 to 1970 then the total of Soviet seaborne trade may reach between 111,000,000 and 130,000,000 tons. The stated Soviet objective is to carry 75% of all cargoes in Soviet ships by 1980. This might work out at about 64% in 1970 or a capacity to carry up to 83,000,000 tons. In a general order of magnitude this would require a merchant fleet totalling some 14,300,000 deadweight tons. To meet this requirement the Soviet merchant fleet would need to be augmented by about 1,200,000 tons a year, a figure well within the capacity of Soviet and Satellite yards.

### Growth of the Merchant Fleet

5. As a result of the rise in the volume of Soviet foreign trade, the Russians embarked in 1958 on an ambitious shipbuilding programme. This programme was designed to double the deadweight tonnage of the fleet by 1965 bringing total Soviet tonnage from about 3,200,000 DWT to a planned figure of about 6,700,000 DWT. This plan was revised sharply upward as a result of the Cuban requirement and by mid 1965 the Soviet merchant fleet ranked 6th in the world in total tonnage with

/1,583 ships

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1,583 ships totalling approximately 9,800,000 DWT. Excluding the fishing fleet, the merchant fleet comprised 1104 ships of about 8,300,000 DWT.

6. By mid 1966 it is estimated that these figures will have been augmented by at least 42 ships totalling over 630,000 DWT, with about 250,000 DWT, bringing the total Soviet Merchant ship tonnage, exclusive of fishing vessels, to over 9,000,000 DWT by mid 1966.

7. It has been reported that the Soviet Union has agreed to build 600,000 DWT of merchant shipping for a Greek ship-owner by 1968. If the delivery dates quoted are adhered to this would amount to an annual 200,000 DWT addition to regular production. This would be a very large increase. Such an increase has not been allowed for in the figures used elsewhere in this paper.

8. In spite of the remarkable expansion of the merchant fleet it is apparent that in terms of capacity to handle the expanded seaborne trade the merchant fleet actually fell behind the demand and the two most important goals listed by the Minister of the Merchant Fleet, those of freeing the USSR from the necessity of chartering the foreign ships and carrying 75% of Soviet seaborne trade in Soviet ships, are still far from being realized. Nevertheless, the greater part of this short-fall took place during the first three years of the plan (when Soviet foreign trade increased much faster than expected primarily as a result of the requirement to supply Cuba) and when the percentage of cargo carried in Soviet ships actually dropped from 55% in 1958 to 37% in 1961-62. Subsequently this trend was reversed and 44% was carried in Soviet ships in 1963 and 48% in 1964.

9. The existing shipbuilding programme appears to be generally consistent with the objectives of the Five Year Plan. But in shipbuilding account must be taken of trends for at least 15 years ahead and in this context certain shortcomings become apparent.

10. The Russian fleet now consists of a large number of good modern small to medium sized ships eminently suitable for general cargo trade with the underdeveloped countries including a number of large hatch ships especially suitable for the arms trade. This is a growing trade area and there is little doubt that a merchant fleet of the present size can be profitably employed. There is however the likelihood that the development of modern technology will enable Russia in the future to become an exporter of high value products such as chemical and engineering products of a sophisticated type. Overseas importers of such products are likely to be found in free world fully industrialized countries or ones which have already reached a considerable degree of industrialization. In trade of this type competitive costs are essential and transportation costs must also be competitive. Western

/trends such as

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trends such as a high degree of automation and containerisation seem to point the way and although there has been some indication of experimentation in the former field there is little in the latter, although in this field the principal problems are involved with infrastructure.

11. Russia may also seek a large share in the growing requirements of African countries for petroleum products and very large tankers may be required to be competitive in this trade. It is known that the Russians have a 100,000 ton tanker on the drawing boards and are arranging deep water facilities for ships of this size. But in the free world, ways to lay down tankers of 200,000 tons are already a reality and designers are talking in terms of 300,000 tons and above.

12. Chemical products, fertilizers and pulp are bulk exports which Russia may wish to sell on world markets, and the export of these products would indicate a future need for very large bulk carriers, specialized tankers, and possibly specialized pulp carriers.

13. However, it is noticeable that the present programme is deficient in orders for these ships. For example; a recent comparison of ships on order for the Japanese Norwegian and Russian merchant fleets showed the Japanese and Norwegians respectively to have 21 and 33 dry cargo ships, 303 and 68 tankers: and 42 and 92 bulk carriers on order whereas the Russians had 298 dry cargo ships, 111 tankers, none of which were very large and only 7 bulk carriers of about 20,000 tons each. While it is acknowledged that the Russians still have a very heavy requirement for cargo ships and tankers, the relatively small order for large bulk carriers is surprising.

14. Soviet dry cargo ships operate liner services on 32 international lines, although these services in many cases do not offer full liner service by western standards. These lines operate on routes where Soviet seaborne trade is already substantial or is developing. Ten of these lines are operated jointly by Soviet and foreign steamship companies on the basis of shipping agreements which specify that cargoes moving on the routes in question will be shared on a 50-50 basis. The remainder involve only Soviet vessels. The USSR has announced its intention to increase its liner services, but has not specified the areas into which the services will be extended. So far the USSR has not shown any sign of building fast modern container cargo liners, this is a coming trend in the free world liner trade and in future years the USSR may be at a disadvantage in attempting to enter some of the more remunerative and competitive liner routes. An example of Russian opportunism in the liner trade is the weekly winter liner service out of Montreal and Quebec for European ports using the modern icebreaking cargo ships of the Ob and Amguema classes. These ships designed for use on the Northern Sea Route are well adapted to winter conditions

/on the St. Lawrence

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on the St. Lawrence and represent gainful employment for a specialized type of ship during the off season. This however, is a special situation tailor made for Russian capabilities.

15. Because of the imbalance of export-import tonnage (90% export) many Soviet ships usually make one leg of the voyage in ballast, as a result Soviet ships notably on the West African run have made competitive and successful attempts to get interport cargo for the return voyage at the expense of free world shipping companies. This trend is expected to continue and on certain routes will be an unsettling factor in the tramp trade. Additionally the Russians may increasingly enter the tramp trade on a seasonal basis when northern ports are closed during the winter months giving rise to a temporary surplus of shipping.

16. Since the first wheat sales to Russia in 1963 an increasing number of Soviet ships have been entering Canadian ports. In spite of the current high level of this traffic it is difficult to forecast any further expansion beyond 1970 since very little reciprocal trade has developed. On the other hand should Soviet dependence on foreign grain imports substantially decline, a considerable reduction in the level of activity would result and traffic might be reduced to the point when it would be difficult to justify cargo liner service between Russian and Canadian ports and when the bulk of the traffic would be Russian ships in the tramp trade competing for Canadian cargoes destined for European ports.

17. It is noteworthy that the Russians have chosen this time to enter the North Atlantic passenger service using moderate sized ships of the Alexander Pushkin class. The experience of western passenger lines seems to indicate that this is an increasingly unremunerative field. However the opportunity to inaugurate a Soviet controlled passenger service with North American ports may seem attractive enough to outweigh the disadvantages.

18. While it is anticipated that the Russians will increasingly compete in the liner and tramp trade and rate cutting may become evident in the tramp trade, it is in the charter market that the greatest impact will be felt. By 1970 the percentage of trade carried in chartered ships may have declined from 56% in 1963 to 36%, and on the other hand the Russians may themselves become competitive in certain sections of the charter market offering fast dry cargo ships and medium size tankers.

19. It may be that although for the foreseeable future there will be profitable employment for a fleet of good modern medium sized general cargo ships, the trend during the next decade will be towards specialization in ship design and employment. If this is the case, most of

/Russia's modern

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Russia's modern merchant fleet existing and presently projected is a fleet designed for the fifties, and early sixties and towards 1970 there is likely to be a growing requirement for modern specialized types of ships, i.e. fully automated container cargo liners, large bulk carriers and very large tankers, specialized chemical tankers, pulp carriers and so forth.

20. To sustain the rate of growth necessary to meet the planned objective of carrying 75% of their cargoes in their own ships by 1980, orders for the required tonnage will probably be placed mainly in Russian, European Satellite, Finnish, and Yugoslav yards and a few specialized types in free world shipyards. However, unless additional unexpected demands are placed upon the merchant fleet, it does not seem likely that further large orders will be placed in free world shipyards. It seems probable that additional ships will be built or acquired at a rate of about 1,200,000 DWT annually.

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July/August 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.

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| 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

SHIPPING - Boarding Reports  
Dairen, 5-19 July 1966

Port Information

1. On arrival, draft of Source's vessel was in excess of 32 ft. However, Source stated that he experienced no difficulty as he is of the opinion that depth in the harbour was in excess of 35 ft. He observed that ships now lighten to a draft of 20 ft. on the east side of pier #2 and are shifted to the west side of pier #1 to complete discharge. Discharging was effected into open railway cars. Discharging was delayed because of the shortage of railway cars. Source also noted that dumping of these cars was in the immediate vicinity because he observed some cars returning empty the following day, after being filled.

2. Source also stated that on this occasion he was advised that a new foreign seamen's entrance to the dockyard had been established and this was now more westward than the previous entrance/exit. It is possible that the previous entrance/exit was the one used by the passenger terminal personnel. Source observed that the dredging in the harbour and the harbour vicinity was in continued operation.

3. Source advised that one of the crew members broke some glass on the quay. The vessel was boarded by five uniformed frontier guardsmen, one of whom was armed. They requested permission to take the man ashore and try him. They convened a court at midnight and advised him that, if he signed a letter of apology for this misdemeanour, he would be allowed to return to his ship. On signing the confession he was returned to the ship but source stated that he was advised that the crew members confession was placed on the public notice board.

4. Source observed several Soviet personnel in harbour and questioned their presence. The ship's agent advised him there are a few remaining Soviet technicians left in port. However, due to the disagreement China is having with the Soviet Union, they probably will be leaving shortly. Source was also advised that there are "quite a few" Japanese technicians in Dairen. Source also stated that it was interesting to note that the agent advised him that quite a "large number" of White Russians still live in Dairen, but these lived in Dairen prior to the Bolshevik Revolution.

Report & Date: WC DBR 27/66 dated  
11 August, 1966.  
Source: DGI(Ottawa)

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II.

CZECHOSLOVAKIA

INDUSTRY - Factories

East Bohemia and North Moravia  
4 August 1966

1. The Canadian Air and Military Attache, accompanied by the US Military Attache, made a tour through East Bohemia and North Moravia, 4 August 1966.

HRADEC KRALOVE - C.B. Q-38

2. They tried to find the ELEKTROKERAMIKA N.P. Factory but were unsuccessful. It is definitely not at coordinates stated (WR5763). A search will be attempted for the factory at a later date.

JABLONNE N. ORLICE - C.B. Q-40

3. They search for the TESLA LANSKROUN N.P. Factory around the town and about 3 kilometres out on all roads leading from the town but could not locate it. In the area there is just not a 3-meter high red brick fence which is supposed to surround this factory.

Evaluation: A2  
Report & Date: IR 30/66 of 8 Aug 66  
Source: CA&MA/PRAGUE

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III.

CZECHOSLOVAKIA

TOPOGRAPHICAL INTELLIGENCE

Central Southern Czechoslovakia

5/7 July 1966

1. The Canadian Air & Military Attache accompanied the US and British military attaches on a tour of Central Southern Czechoslovakia through KOLIN-JIHLAVA-BRNO-HODONIN-KONOVICE-UHERSKY BROD-TRENCIN-NOVAKY-PRIEVIDZA-ZVOLEN-KRUPINA-LEVICE-ZELIEZOVCE-STUROVO-KORMARNO-NOVE ZAMKY-SALA-GALANTA-TRNAVA-SERED-NITRA-SERED-HLCHOVEC-PIESTANY-SENICA-HODONIN-BRNO-JIHLAVA-KOLIN, during 5, 6, 7 July 1966.
2. A full report has been made and circulated to interested persons (see British report DA 2/211/38 dated 19 July 1966).

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IV.

CZECHOSLOVAKIA

TOPOGRAPHICAL INTELLIGENCE

Tour, 11 Aug 66

1. The Canadian Assistant Air and Military Attache accompanied the British Attaches on a tour, 11 August 1966, through PRAGUE-BEROUN-ZDICE-HOROVICE-PRIBRAM-PISEK-VODHANY-NETOLICE-STRAKONICE-HORAZDEVIC-BREZNICE-MILIN-DOBRIŠ-PRAGUE, on a routine check of air, SAM and military sites.
2. A full report has been made and circulated to interested persons (see British report AA/171/66 dated 12 August 1966).

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V.

INDIA

GUIDED MISSILES

Chandigarh Airfield, 1966

1. Though no details can be provided at this time, the provision of surface-to-air (SA2) missiles by Russia appears to be accepted fact. A sighting in the vicinity of the Chandigarh airfield where the Russian AN 12s, Mi4s, and Migs are based confirms not only the provision but also the apparent operational state of the missiles. It is believed that there may be additional sites in the Delhi/Agra area.

Report Date: 7 July 1966  
Source: CFA/India

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VI.

INDIA

AIRCRAFT

August 21, 1966

1. The supply of Mig 21's is considered to number 105 aircraft of which approximately 60 are flying. All of these aircraft were shipped from Russia for assembly in India. In the most recent shipment, it was considered that 4 trainers were included and that no trainers had been available in India prior to March at the earliest. No details on performance of the aircraft in India have been obtained though it is understood that modifications are being included to extend its range and endurance.

2. It is also understood that the Russians have doubts as to the Indian capacity to cope with the production of the electronic components of the Mig 21 and that they anticipate a call for Russian technical assistance.

Report Date: 7 July 1966  
Source: CFA/Inida

SECRET

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JIB(CAN) 16/66

VII.

INDIA

SHIPS - Naval  
Ordered from Russia 1966

1. The equipment which has been ordered for the Indian Navy from Russia is believed to be:

- a. Submarines - four conventional, first expected to be delivered in 1967;
- b. Destroyer Escorts - Three Petya class;
- c. Depot Ship - one submarine depot ship;
- d. LSTs - Two, one possibly delivered;
- e. Patrol Boats - possibly, an unknown number.

Report Date: 7 July 1966  
Source: CFA/India

SECRET

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JIB(CAN) 16/66

VIII.

PAKISTAN

TOPOGRAPHICAL INTELLIGENCE

Pakistani Visit to Moscow,  
July 1966

1. The USSR Services Attache, Rawalpindi, preceded the visit to Moscow of A/M Nur Khan and team in July 1966. He was there during the visit and returned to Karachi two days after the team returned there. He said that the visit was a familiarization visit only, that there was no expectation of an agreement being signed and that none had been signed. He met both A/M Nur Khan and the CGS, Maj Gen Yaqub, in Moscow and both seemed very pleased with their visit and with the treatment they were receiving.

2. Source asked him whether he expected that Pakistan would receive equipment from the USSR in the future and he said this was a good possibility particularly as the type of equipment would "have similar characteristics" to the equipment that Pakistan was receiving from China. He told me that General Yaqub was very pleased with the T59 and thought that it was an excellent tank for Pakistan. I didn't give any indication as to the number of these tanks I thought might be in Pakistan and he said that he had only seen the ones on the Pakistan Day parade but thought there were quite a large number here now.

3. Source asked whether the provision of military equipment to Pakistan might not make his country unpopular in India. Col Sazhin said that this was a possibility but if an agreement were signed he thought that any storm would quickly blow over and that the USA had sold to both sides and became unpopular only when the flow was cut off.

Evaluation: A-2  
Report & Date: IR 27/66 of 22 Jul 66  
Source: CFA/Pakistan

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JIB(CAN) 16/66

IX.

PAKISTAN

TRANSPORTATION - Trucks  
Rawalpindi, July 1966

1. For the past month (July 1966) or so approximately 50 brand new trucks of USSR origin, probably from China (believed called "Liberator" and the source said they are similar to the "Zis 151" which he knew when stationed in Moscow) have been parked in a compound near Chaklala (Rawalpindi) airfield. As far as source could see none of them had moved since their arrival.

Evaluation: A-2  
Report & Date: IR 24/66 of 21 Jul 66  
Source: CFA/Pakistan

SECRET

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JIB(CAN) 16/66

X.

POLAND

RADAR  
Southeast of Warsaw  
11 August 1966

1. West of STOCZEK LUKOWSKI, South of trig point 197 at approximately 640576 is an unidentified radar installation. It consists of four large circular mesh type disc radars estimated to be 30 to 36 feet in diameter, two single pole type antennae and seven plus large box body type vehicles. The circular radar discs appeared to be sighted in pairs back to back and in an EAST-WEST alignment. The discs were stationary and appeared to be fixed in their alignment.

Date & Report: IR 26/66 of 15 Aug 66  
Source: CFA/WARSAW

SECRET



11.

SECRET  
JIB(CAN) 16/66

XI.

POLAND

TRANSPORTATION - Railways  
Gora Kalwaria/Lukow, 11 Aug 66

1. The railway line between GORA KALWARIA and LUKOW was under observation at various points, from approximately 1015 hrs to 1500 hrs. During that period the following were noted:

EAST BOUND - Three freight trains with assorted wagons varying between 30 and 45 cars. One two car diesel passenger train.

WEST BOUND - Four 50 car plus freight trains.

2. Trains were loaded with various materials and equipment such as coal, ore, new motor cars and boxed equipment. No military equipment or personnel seen.

Date of Report: IR 26/66 of 15 Aug 66  
Source: CFA/WARSAW

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12.

CONFIDENTIAL  
JIB(CAN) 16/66

XII.

U.S.S.R.

AIRFIELDS

Lyubertsy Airfield,  
15 June 1966

1. The Canadian Assistant Air Attache accompanied the US Air Attache on a visit to LYUBERTSY Airfield (Helicopter area), on 15 June 1966. A complete report has been circulated to interested persons (SICR A-FSC-11907, IR 1 901 0119 66).

CONFIDENTIAL

000753

SECRET  
JIB(CAN) 16/66

XIII.

U.S.S.R.

MARKINGS - Aircraft  
Moscow Area, April and  
June 1966

1. The Canadian Naval Attache, on 30 April 1966 in Moscow (Vnukovo) observed markings

IL-18      75504 (183006402)

Report & Date: N71/66 of  
4 May 66  
Source: CNA/Moscow

2. On 26 June 66, observers drove to Moscow (Vnukovo) 2 terminal for the departure of the Russian parliamentary delegation headed by Polyansky and accompanied by the Canadian ambassador. The following observation was made of markings on the delegation's aircraft:

IL-18      75595 (186008901)

Report & Date: A65/66 of  
28 June 66  
Source: CAA/Moscow

SECRET

SECRET  
JIB(CAN) 16/66

XIV.

U.S.S.R.

TOPOGRAPHICAL INTELLIGENCE

Viborg-Leningrad-Moscow

7-8 June 1966

1. The Canadian Naval Attache made a trip Viborg-Leningrad-Moscow, 7-8 June 1966.

Viborg

2. The rail and highway overpasses on the Saimo canal are progressing and would appear able for completion in 1967. It would appear shipping with a mast height of at least 75 feet can pass through. It was again noted that roadside telephone (and other communications ?) were buried underground emerging at K 15 as 16 wires on newly erected poles (by army construction troops) and increasing to 24 wires at K 20, from the Finnish border.

Road Trip to Moscow

3. At K 599 from Moscow no change was seen in the radar site. At K 229 from Leningrad at the heliport were seen 12 plus Hounds and 5 plus Hooks, when these places were seen. At Kallinen a small army detachment with one tank were under canvas near the bridge over the Volga. The usual cocooned T54 ? tanks were seen. However in the field  $\frac{1}{2}$  Kilo on, between road and workshops were 32 T54 ? tanks in close formation of eight rows of four. Some had new wooden ribbing extending around the turret and forward along the gun barrel as if a preliminary to the cocooning process. At Kallinen airfield 19 plus Badgers were seen. Klin airport was hidden in a thunder shower. Work is progressing on the domes (E33).
4. Flooding conditions around Novgorod are still acute and will be most detrimental to crop prospects. However the Volga at Kallinen appears at normal levels. The passenger ships or accommodation ships that wintered on the Volga near Kallinen have been removed.
5. Frequent foot and mouth disease prophylactic stations on the main road and side roads were noted.

Evaluation:	A-2
Report & Date:	IR N-84/66 of 15 Jun 66
Source:	CNA/Moscow

SECRET

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JIB(CAN)16/66

XV.

U.S.S.R.

TOPOGRAPHICAL INTELLIGENCE  
Aircraft and Communications  
Facilities, Moscow/Leningrad  
Trip 14-18 June 1966

1. The Canadian Air Attache, accompanied by the French Assistant Air Attache, made an air trip MOSCOW/LENINGRAD from 14-18 June 1966.

MOSCOW to LENINGRAD 14 June

(a) Flight - varying amounts of broken cloud.

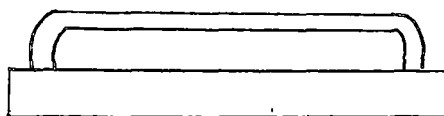
1235 hrs - Airborne SHEREMETYEVO

1255 hrs - Runway several miles to port, near and northwest of a city; no aircraft or activity seen.



Air/c Hdg  
approx

1321 hrs - Runway similar to above about 2 miles to port; no aircraft or associated buildings seen.



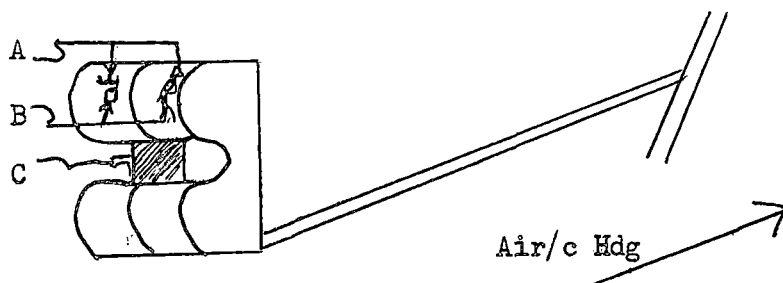
Air/c Hdg

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(Moscow/Leningrad trip  
14-18 June 66, cont'd)

SECRET  
JIB(CAN) 16/66

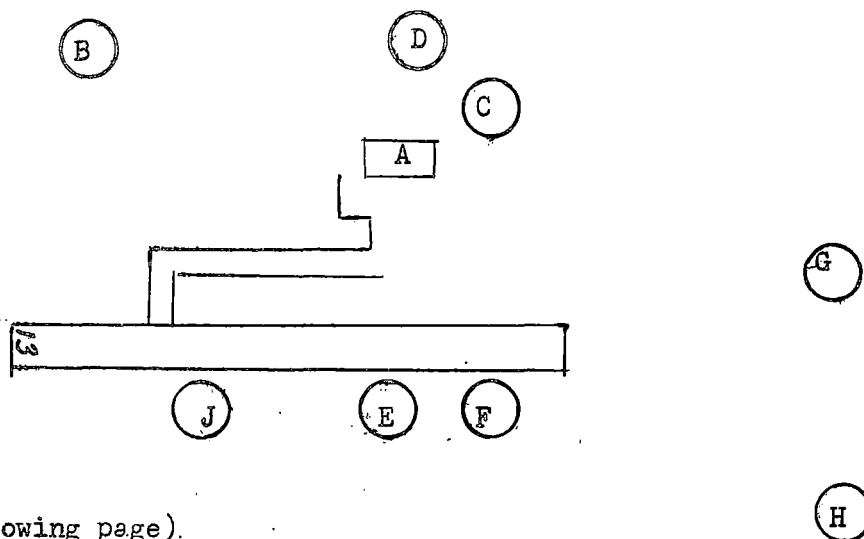
1325 hrs - Unidentified site on port side



- A - Horizontal white objects
- B - Small hut-like objects
- C - Dark cleared area containing dark huts and/or equipments with what appeared to be vehicle tracks in dirt

1331 hrs - Landed LENINGRAD/KAMENKA

- (b) LENINGRAD/KAMENKA - Electronics facilities observed are shown below.



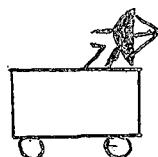
(Legend on following page).

(Moscow/Leningrad trip  
14-18 June 1966, cont'd)

SECRET  
JIB(CAN)16/66

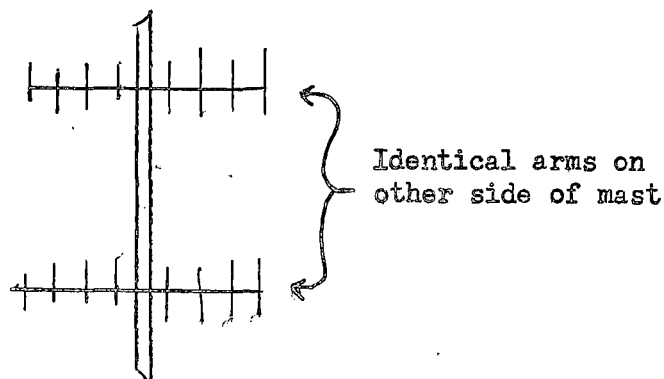
- A - Terminal (2 dry rack, MG, FN, discones, caged dipoles)
- B - 2 FR
- C - Trailer with solid dish on mound (see Note 1 below)
- D - FR with 2 "unique" 50 ft antennas (see Note 2 below)
- E - 3 One-Eye (2 with End Box)
- F - Probable Long Eye
- G - 2 FR
- H - 3 BL on ridge (lowest, centre on working)
- J - 2 Hay Rick with approximately 6 Hay Poles

Note 1: Solid dish about 5 ft diameter scanned vertically from what appeared to be dish vertical to dish horizontal, completing cycle in 32 seconds approximately. After nodding several times, with dish near vertical it rotated several times at approximately 4 rpm.



Note 2: The 2 "unique" antennas were reported by another observer. The following comments refer to the sketches shown in these reports.

- (i) Mast with "Rebecca-type aerials" estimated to be 50 ft;
- (ii) Mast with "Yagi-type arrays". Source's impression of the side view was as shown below:



SECRET

(Moscow/Leningrad Trip  
14-18 June 66)

SECRET  
JIB(CAN)16/66

Source got the impression that the vertical reflectors on the mast of this type decreased in length towards the West or Northwest end of the array.

LENINGRAD AREA, 14-17 June

2. The following items were noted in Leningrad:

- (a) Jeep 67-98 AA was parked in front of the Naval Engineering College "Dzerzhinsk" (TFP 27/62 JIB Serial 86A)
- (b) An abortive attempt was made to observe LENINGRAD/KOLOMYAGI airfield from the east. Observers left Karla Marxa at 66°55.6N and trekked through a quite-heavily wooded and occasionally-populated park land until an uninteresting complex of old brick and masonry factory buildings were encountered which observers did not have time to skirt. No air activity was seen and no aircraft engine noises heard.
- (c) A group of 12 sailors were waiting to be let into a gate on Bolshoi Prospekt near Kozhevenaya - the probable submarine school (JIB Serial 100).
- (d) 3 Madge including one with a MAD-type tail extension and bearing number 34 on its fuselage were seen at the seaplane base (JIB Serial 99).
- (e) A taxi driver during a short tour of points of interest pointed out
  - (i) the TV tower which he stated was 316 metres high;
  - (ii) the "Military Air Force Academy" (presumably JIB Serial 50C) at which no activity was noted and on which only a small cluster of communications-type antennas were seen on the roof, at the right-hand end of the building;
  - (iii) a para-jump tower in one of the parks with several workmen or sportsmen possibly checking its ropes and pulleys.

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(Moscow/Leningrad trip  
14-18 June 66, cont'd)

SECRET  
JTB(CAN)16/66

PUSHKINO, 16 June

3. The following observations were made during a trip to PUSHKINO:
- (a) Two masts, similar to the ones seen with a FR reported in 1(b) of this report, were observed quite close to the road on the LHS at approximately 59°45N 30°21E.
  - (b) Observers exited Ekaterina Park by the Orlovskiya Vorota and walked left along the main road (473 bus route). A block or two along caught a glimpse down a side street on the left, of portions of MIG-type aircraft not more than a few hundred feet away and believed them to be MIG 15/17.
  - (c) Source then proceeded on foot in a westerly direction along the north side of Pushkin airfield and saw through the trees one IL-18, six to eight Badgers, several Cubs, and at a distance the tails of a line of five or six fighter-type aircraft (with Fresco/Firebar-type tails). While source was in vicinity, from 1115-1235 hrs, two SAF Hounds (one bearing No. 14 on the rear of the fuselage), and several Aeroflot aircraft flew over nearby. Although engine run-ups were heard on several occasions, no activity was viewed on or from the field itself.
  - (d) Source waited (for a ride back to the park) at a bus stop with a hoe-equipped Russian woman who said buses ran every 40 minutes. Although source had not seen one pass him going in the direction of town during his walk down the highway, he waited more than an hour before one (No. 473) came by.
  - (e) At approximately 1250 hours, while he was walking back through Ekaterina Park a probable Firebar flew past.

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(Moscow/Leningrad trip  
14-18 June 66, cont'd)

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JIB(CAN)16/66

LENINGRAD to MOSCOW, 17 June

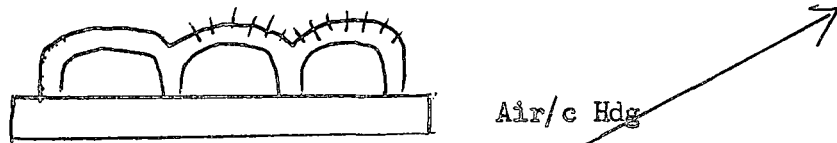
4. The following observations were made during the journey Leningrad to Moscow:

(a) Flight - Varying amounts of broken cloud

1307 hrs - Airborne on runway 13

1311 hrs - Unidentified site on port side (see sketch at 1425 hrs (sic) Moscow to Leningrad flight)

1342 hrs - Airfield a few miles to port - 12 possible aircraft in position indicated.



1353 hrs - Moscow SAM site E 01-1/3 seen briefly through broken cloud. SA-1 pattern not initially clearly visible because of heavy growth of trees on site. No missiles or activity noted.

1400 hrs - Landed Sheremetyevo

(b) At Sheremetyevo - Observed AN 2M landing

Report & Date: A61/66 of  
28 June 1966  
Source: CAA/Moscow

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JIB(CAN) 16/66

XVI.

U.S.S.R.

TOPOGRAPHICAL INTELLIGENCE

Moscow-Brest and Return

25-28 June 1966

1 The Canadian Air Attache made a rail trip from Moscow to Brest 25 June 66 and returned by car, 28 June 1966. The following observations were made:

TRAIN, MOSCOW-BREST

<u>TFP</u> <u>154/62</u>	<u>KM (from Moscow)</u>	<u>OBSERVATIONS</u>
-	417	Train in RR yards consisting of one passenger wagon, 5-10 M wagons on box cars. A group of people (believed to be military prisoners) in civilian dress stood about one M wagon.
-	424	<u>Rail-Smolensk.</u> Military train observed carrying 5 truck Vans, 2 generators, 3 GAZ 51's and 1 Van.

OBSERVATION IN BREST

<u>TFP</u> <u>32/63</u>	<u>OBSERVATIONS</u>
AL-1 5	BRDM 503 passed the hotel (BOOG) coming from the direction of this installation. See sketch #1 for additional details. UL. BRESTSKIK DIVISII passes SW side of this installation, not UL. AVIATIONNAYA. Observers were stopped twice while on foot, going NW along UL. BRESTSKIK DIVISII towards the airfield. Bus #8 goes past the installation towards the airfield.
AL-6 86	<u>MILITARY BARRACKS AREA.</u> This is an extensive area located approximately 8-9 KM from BREST. Observers reached this area by Bus #1 from its starting point in Brest - destination at the time unknown. Observers found the bus half-filled. Unexplainably all passengers were required to leave the bus without any reason being given. Observers left the bus and began walking down the street. At the first bus

/bus stop our

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(Moscow-Brest and Return Cont'd)

SECRET  
JIB(CAN) 16/66

TFP  
32/63

OBSERVATIONS

stop the "not working" bus made an appearance and observers again boarded it - with the "nasties" close behind. This bus goes directly through this military area. (See SKETCH "2 for details.) At all the bus stops in this area there were patrols of two or three enlisted men. At the village of VUL'KA one patrol came out to meet the bus and left when the bus departed. TK/BLK was the predominant branch in this area with GUARDS BADGES in considerable profusion. It was interesting to note that not all TK/BLK wore GUARDS BADGES. Heavy foliage and rain precluded a thorough reconnaissance of the area.

In the military housing area numerous women, soldiers, and officers were seen entering and leaving.

(Sketches 1 and 2 follow)

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JTIB(CAN) 16/66

(Moscow-Brest and Return Cont'd)

VOLYNKA

SKETCH #2 (Not to Scale)

To Brest

Vul'ka

800-1000'

10

2

1

Pond

Various Buildings  
undetermined capacity

2500'

Legend

- (1) Guard tower
- (2) Bus stops w patrols
- (3) Sheds
- (4) T-62 tank and 3 soldiers
- (5) Sheds
- (6) 30 troops bathing
- (7) 40-50 troops engaged in volleyball
- (8) Stacks of Ammo boxes w/armed guard.
- (9) Possibly tank ammo
- (10) 4 stacks totalling approx 1000 boxes
- (11) 2-3 truck vans
- (12) Van and a BTR 152
- (13) command vehicle
- (14) Patrol outside fence
- (15) ARTY/BIK with weapons.
- (16) One armed guard inside.

3

5

Recreation Area

Stadium

10-20 soldier

Monument

Military

Housing

Area

(Moscow-Brest and Return Cont'd)

SECRET  
JIB(CAN) 16/66

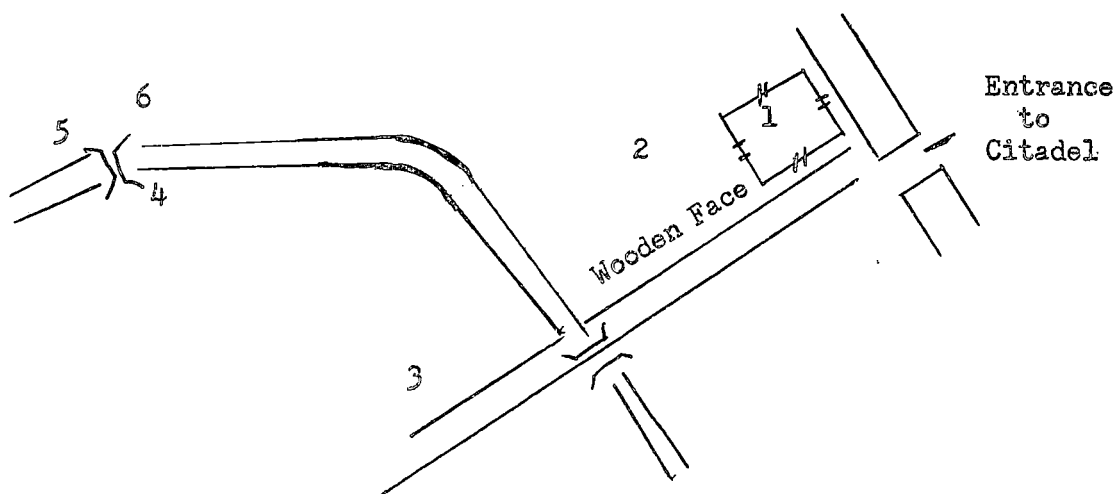
TFP  
32-63

66

OBSERVATIONS

MILITARY BARRACKS AND DEPOT IN CITADEL. Military barracks were not seen, however, on entering citadel; there is a fence which goes along the west side of the road, and prevents entry into that area.

SKETCH #3 (Not to Scale)



LEGEND

- (1) Barbed wire surrounding a brick bldg.
- (2) Possible TUB BRICK
- (3) Four soldiers in work uniform looking over fence
- (4) Bridge with a "Forbidden to Cross" sign
- (5) Guard tower with 2 guards
- (6) 20-30 tents approx 4-man size with troops

RR STATION

At 1045 hrs, 26 Jun, a trip was made to RR Station. Observers observed approximately 100 soldiers and officers apparently going on leave. RR station was very active.

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(Moscow-Brest and Return Cont'd)

SECRET  
JIB(CAN) 16/66

BREST - MOSCOW

2 The following observations were made during the road trip from Brest to Moscow.

<u>TFP</u> <u>203</u>	<u>KM (from Moscow)</u>	<u>OBSERVATIONS</u>
52	1042, RHS	Military barracks, nothing observed
-	1030, LHS	Vesna tower - one horn facing east.
49	1001/2	Barracks area. Nothing seen at this locations except a cotton or bread factory.
48	1001, RHS	<u>Kobrin Airfield</u> . No aircraft seen during the brief glimpse of this field. There was a HAY series and 2 caged dipoles near the road.
45	945-947	<u>Barracks Area</u> . This should read 948.5.
-	941, RHS	Vesna tower, 2 horns, one E, one W.
-	928.3, LHS	Radar site. 1 STRIKEOUT
-	900	VRN 55-23 EA exited a side road (LHS) and turned toward Moscow.
-	862, LHS	Small POL storage, 6 horizontal tanks.
-	848	<u>Baranovichi Military Barracks</u> . The main street in Baranovichi is Ulitsa Brestskaya. The garrison is located behind the DOM OFFITSEROV (which is at 279 Ulitsa Brestskaya).
-	791, LHS	Vesna tower - two horns mounted parallel to the highway.
-	748, RHS	Possible barracks.
-	724, RHS	<u>PTICH</u> . New spillway and reservoir is being constructed with a new road being built over the dam.
AL-1	694, LHS	<u>Military Barracks active</u> . At the north end of the installation there were an estimated 50 vehicles including several canvas-covered objects, about the size of a van.

(SKETCH #4 to follow)

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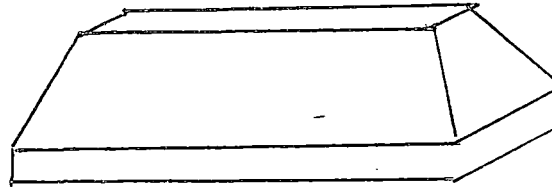
000767



(Moscow-Brest and Return Cont'd)

SECRET  
JIB(CAN) 16/66

SKETCH #4



<u>TFP</u> <u>203</u>	<u>KM (from Moscow)</u>	<u>OBSERVATIONS</u>
-	650, LHS	Zhdanovo Auto Works.
-	587, RHS	Fourteen horizontal POL tanks.
-	551, RHS	Radar site.
-	547, RHS	"Goalposts" were not seen despite ideal weather conditions.
-	501, LHS	Radar site
-	398, LHS	Smolensk Radar site
-	386, LHS	Radar site
-	304, LHS	Safonovo Radar site
-	172.5	Power lines crossing road - 4 sheds.
-	70, LHS	Kubinka Structure.

MISCELLANEOUS OBSERVATIONS

3. Hereunder are presented miscellaneous observations made throughout the trip.

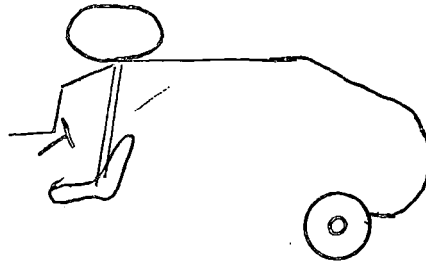
- (s) A Military GAZ-69 was seen in Brest with a canvas-covered "bundle" on the roof (above the windshield) sitting on a metal post within the vehicles. The post extended up between the seats.  
(Sketch follows)

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000768

(Moscow-Brest and Return continued)

SECRET  
JIB(CAN) 16/66



(b) Vehicle Chassis Numbers

- (i) GAZ-53 - N 93786
  - left front tire XII 6518 <sup>A</sup> 190
- (ii) ZIL-130 - 106850
  - mounted with a model K37A crane.
  - Crane had 777 stamped on the back below the cap.

Report & Date: A-68/66 of 4 Jul 66  
Source: CAA/ Moscow

SECRET

000769

SECRET  
JIB(CAN)16/66

XVII.

U.S.S.R.

VETERINARY ITEMS  
Foot & Mouth Disease

1. The Canadian Naval Attache, while on tour in Leningrad 1 August 1966, observed that foot and mouth disease appears most serious around Kallinen, where every side road had a barrier, prophylactic pad and police on duty.
2. Prophylactic stations across the main highway were noticed at Pushkin and on the Leningrad Highway at K.103 (liquid trap as well), K.577, K.610, K.614.

Report & Date: IR N-105/66 of  
10 August 1966  
Source: CNA/Moscow

SECRET

SECRET  
JIB(CAN) 16/66

XVIII.

U.S.S.R.

SHIPPING - Naval Construction  
Leningrad, March 1966

1. The Canadian Naval Attache accompanied the US Assistant Naval Attache in Leningrad and Tallinn. Principle sighting was a probable new class of surface ship under construction at ZHDANOV Yard in Leningrad.
2. A report has been made and circulated to interested parties (US Report 5 901 0855 66 of 11 April 1966).

SECRET  
JIB(CAN) 16/66

XIX

U.S.S.R.

SHIPPING - Port Report  
Archangel 8-10 July 1966

1. The Canadian Naval Attache, accompanied by the British Naval Attache, made a trip to Archangel 8-10 July 1966.
2. In the basin of the Krasnaya Kuznitsa shipyard were seen a collection of small naval auxilliary including a Poluchat. The masts of the Riga's alongside the Naval yard were visible from Levacheva.
3. There were two 3000-ton passenger liners along the wall at the sea station and the large tug/icebreaker Pronchechev. In the strait between Museyev Ostrov and the shipyard were seen: three 4000-ton merships, one quite new, the Vostok 5. One was in a floating dock. The island itself has no visible marine connotation. Once can look right through the windows of the largest building which seems to use a pile of yellow sandlike product in its markings.

Report & Date: IR N-97/66 of 12 Jul 66  
Source: CNA/Moscow

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000772

SECRET  
JIB(CAN)16/66

XX.

U.S.S.R.

SHIPPING--Merships  
Cameras, Soviet vessel  
KOMMUNARSK, Montreal,  
9 July 1966

1. The Soviet mer ship KOMMUNARSK (callsign UNVF) visited Montreal 9 July 66.
2. Crew members were noted as carrying cameras with the following identification numbers:

FED n.688231

Zorky 2 n.556192

Zorky S n.57019433

Zorky Z n.6031704

Zorky 4 n.6437165

FED n.629495

Rolleiflex n.1919307

Zaria n.9003729

Cinema camera "Admira - 16 Electro"  
n.01-611132

Date of Report: 5 August 1966

Source: Reliable Canadian

SECRET

SECRET  
JIB(CAN) 16/66

XXI.

U.S.S.R.

(A)

SHIPPING - Fishing Fleets

Visit, Supply Tanker "DARNITSA"

Halifax, 1-2 August 1966

1. The Soviet tanker DARNITSA (callsign UJJA) was in Halifax 1-2 Aug 66.

Personalities

2. Captain: Kapitan NOKHRIN  
Height: 5'7"  
Weight: 150 lbs  
Complexion: dark  
Hair: brown  
Eyes: blue  
English: nil

3. A picture of a swan was tattooed on the back of left hand. The man himself was a very amiable type.

Available Data

4. Gross Tonnage - 3359.56 tons  
Net Tonnage - 1150 "  
Official No. - M 17144

Date of Report: 19 August 1966  
Source: DGI/INT S

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SECRET

34

JIB(CAN) 16/66

XXI  
(B)

POLAND

SHIPPING - Fishing Fleets

Visit, Trawler HOMAR

Halifax, 2 August, 1966

1. The Polish trawler HOMAR (SWI 199) was in Halifax 2-3 August, 1966.

Personalities

2. Captain: ANDRZEJ WOJTOWIEZ  
Height: 5'7"  
Weight: 175 lbs  
Complexion: Fair  
Hair: Brown and wavy  
Eyes: grey  
English: fair  
Age: 36

Date of Report: 19 August 1966  
Source: DGI/INT S

SECRET

000775



SECRET  
JIB(CAN) 16/66

XXI  
(C)

U.S.S.R.

SHIPPING - Fishing Fleets  
Visit, Tug KAPITAN NOKHRIN  
Halifax, 1-2 August 1966

1. The Soviet Tug KAPITAN NOKHRIN was in Halifax 1-2 August 1966.

Personalities

2. Captain: .....  
Height: 5'10"  
Weight: 200 lbs  
Complexion: fair but somewhat flushed  
Hair: brown  
Eyes: blue  
English: fair

3. A one-inch vertical scar over his left eye. This Captain appeared to be precise and efficient. The crew seemed slightly fearful of him as indicated by the way they jumped when orders were given. He was not antagonistic but appeared to have a good idea of the port requirements and offered only as much help as was demanded of him.

Date of Report: 19 August 1966  
Source: DGI/INT S

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JIB(CAN)16/66

XXI  
(D)

U.S.S.R.

SHIPPING - Fishing Fleets  
Visit, Fuel Tanker, KONKAND  
Halifax, 14-20 July 1966

1. The Soviet ship KONKAND (callsign UIWV) was in Halifax 14-20 July 66.

Personalities

2. Captain: VALENTIN LAVROV  
Height: 6 ft.  
Weight: 190 lbs  
Complexion: dark  
Hair: brown  
Eyes: blue  
English: excellent  
Three gold teeth, upper left front.

3. The KOKAND is a clean, well-kept ship. The Captain claimed this to be his first visit to Halifax but had all the necessary papers neatly arranged for the authorities. He appeared to be a very astute man and knew exactly what was required of him.

Date of Report: 19 August, 1966  
Source: DNI/INT S

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JIB(CAN) 16/66

XXI  
(E)

U.S.S.R.

SHIPPING - Fishing Fleets

Visit, Trawler MAHACH KALA (RT 305)  
Halifax, 31 July 1966

1. The Soviet trawler MAHACH KALA (callsign UEEE) was in Halifax 31 July 66.

Personalities

2. Captain: VICTOR KOTLJROV  
Height: 5'7"  
Weight: 150 lbs  
Complexion: fair  
Eyes: brown  
Hair: dark blond  
English: nil  
Age: about 35  
No visible marks or scars

Available Data

3. Gross tonnage: 646.76 tons  
Net tonnage: 219.52 tons  
Call Sign: UEEE  
Official No: M 10112

Date of Report: 19 August 1966  
Source: DGI/INT S

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JIB(CAN) 16/66

XXI  
(F)

USSR

SHIPPING - Fishing Fleet  
Soviet MICHAIL PARAGHIN, SRT 3170  
Halifax 10-12 August, 1966

1. The Soviet beam trawler MICHAIL PARAGHIN (callsign UDTO) visited Halifax 10-12 August 1966, to have a fishing trawl net removed from propeller.

Narrative

2. MICHAIL PARAGHIN was towed into Halifax by the Soviet tug KAPITAN NOKHRIN. On arrival the tug anchored in the commercial anchorage south of Georges Island and the trawler secured along-side the tug. The task of clearing the net from the trawler propeller was carried out by divers from the tugs ships company. It is not known if the task of removing the offending net from the propeller actually took the full 27½ hrs that the trawler was in port or not.

3. Since the particulars of MICHAIL PARAGHIN are not advertised in any publication held, the following are forwarded for information.

- (i) Net tonnage - 88 tons
- (ii) Gross tonnage - 334 tons
- (iii) Call Sign - UDTO
- (iv) Number of Crew - 24
- (v) Ships official number - M-24193

4. The trawler appeared to be in a very poor state of maintenance and repair and according to three separate sources the ship and all who sailed in her were very dirty.

Date of Report: 2 September 1966

Source: DGI/INT S

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JIB(CAN) 16/66

XXI  
(G)

U.S.S.R.

SHIPPING - Fishing Fleets  
Visit, Trawler "PERSEY" (RTM 7038)  
Halifax, 20 July 1966

1. The Soviet trawler PERSEY (callsign UVSW) was in Halifax 20 July 1966.

Data Available

2. Gross Tonnage: 2435  
Net Tonnage: 1070  
Registry: Kaliningrad  
Crew: 80  
Built: 1964  
Place: Stralsund, Germany  
Engines: 2 Diesel  
Horse Power: 1650

Personalities

3. Captain: BEZUS TAVEL  
Height: 5'2"  
Weight: 160 lbs  
Hair: dark, short, slightly receded  
Eyes: hazel  
Complexion: light  
English: good  
Anchor tattooed on right hand between thumb and forefinger.

4. EMIL PAK - Probably Korean. This man has been in and out of Halifax on Soviet trawlers for the last year or so. He is always well dressed and is thought to be the political officer.

Date of Report: 19 August 1966  
Source: DGI/INT S

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XXII.

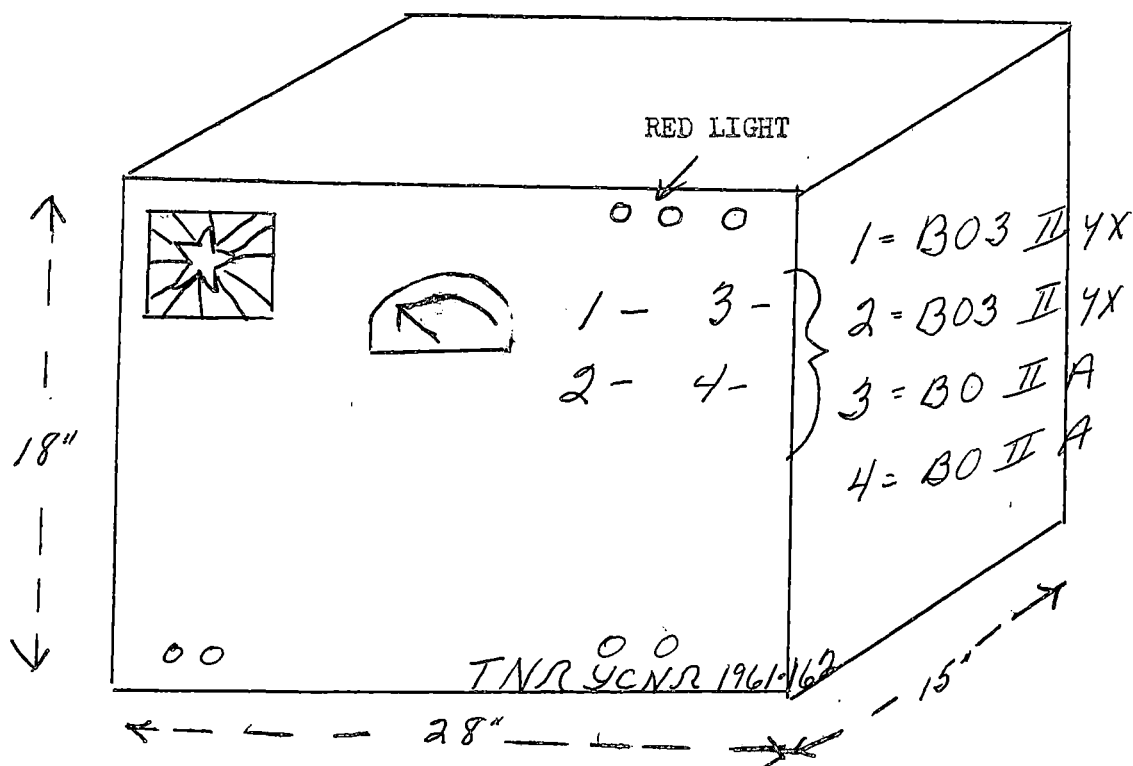
U.S.S.R.

SHIPPING - Electronic Reports

Mer ship BALTISK, Montreal

22 April 1966

1. The Soviet mer ship BALTISK (callsign UVHY) was inspected late in the evening of 22 April 1966, after the longshoreman strike had abated, and just after Seaway R/T voice VHF equipment had been installed, in Montreal.
2. BALTISK is a cargo vessel of 5,584 tons, registered at Leningrad. Her voyage was Leningrad-Antwerp, Toronto-Hamilton. She carries two radio operators - the Chief Radio Officer was TAROVOY STANISLAV, a first class certificate holder NL616/O-4/I-1961 Odessa, and the assistant was SHLYK MICHAEL, a second class certificate holder N31636 27/VII-1965 Leningrad.
3. The layout of bridge, chartroom and electronic equipment is as shown on the following page. The radar was a DONETS II, there were two centre fed FLAT TOP MF/HF wire antennas between the two masts. One VHF dipole affixed to the masthead. MF/DF loops were also installed.
4. There was a radiation measuring unit located in the wheelhouse in conspicuous position



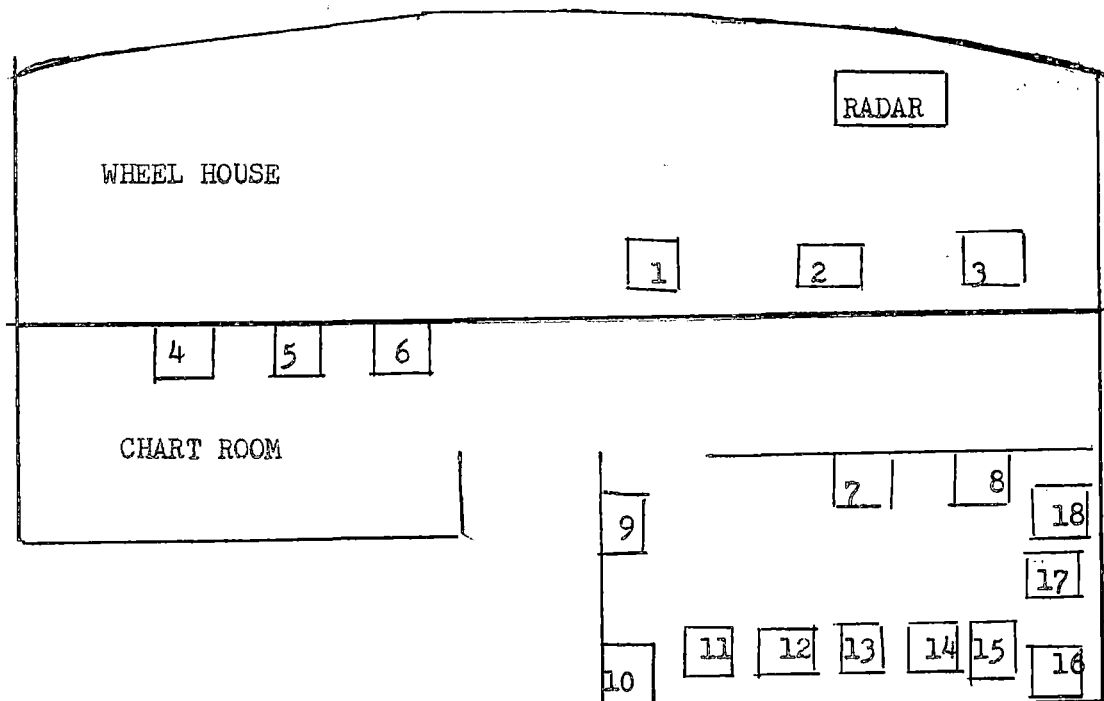
Sketch of unit.

SECRET

(BALTISK electronic  
report, 22 Apr 66)

SECRET  
JIB(CAN)16/66

Layout of Bridge, chartroom and electronic equipment rooms:



- (1) Radiation Measuring Unit
- (2) VHF Remote Control
- (3) Canadian Marconi CN86MF/RT
- (4) VHF Transmitter
- (5) MF/DF
- (6) DF Power Supply
- (7) MF/RT
- (8) Auto Alarm
- (9) VHF Control

- (10) VHF TX/RX
- (11) Tape recorder
- (12) Lifeboat TX
- (13) Main transmitter
- (14) Emergency Receiver
- (15) Main Receiver
- (16) HF Receiver
- (17) HF Transmitter
- (18) Auto Keying Unit

SECRET

(BALTISK Electronic  
Report, 22 April 66)

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	Make	Model	Frequencies	Power KW
Main transmitter	BLESNA 115V, 1958 427 P.C.	0276	365-550 Kc/s	.250
HF Transmitter	BLESNA 1958, 115V 427 RU	0109	2840-22720 Kc/s	.250
Emergency Transmitter	ACP-2-0.06 (1958)	N1050	410-512	.060
RT Transmitter	ERSH (1964)	N04954	1500-2400 Kc/s 360-550 Kc/s	.100
VHF - R/T Transmitter	AKACIA (1959, ser. 590892)		100-140 Mc/s	.006
VHF - R/T Transmitter	KORABL 2 (1965)	000165	156-025- 162.025 Mc/s	.010
Main Receiver	WOLNA (1959)	0127	12 Kc/s-23 Mc/s	
HF Receiver	WOLNA (1959)	0135	12 Kc/s-23 Mc/s	
Emergency Receiver	PASS-2 (1959)	795	380 Kc/s-600 Kc/s	
Automatic Alarm	APM-54 (1959)	N846	488-512 Kc/s	
DF (M/F)	SRP 5 (1958)	5875	186-376 Kc/s 375-750 Kc/s	
DON Radar	DON (1965)	31114		.05
Automatic Keying	ASPSTB-2 (1959)	N373	Fuz=9.375,000 Kc/s Keys, Mains & Emgcy	
Lifeboat Apparatus	ELEKTROMEKANO A/S (ser. 1464)	SM-108 KH-2	500 & 8364 Kc/s	3W
Transmitter Frequencies	512-500-480-468-464- 465-410-3180-4164- 6294-8392-12,588-16,784			

Date of Report: 18 July 66  
Source: DGI/INT S

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XXIII.

YUGOSLAVIA

OIL - Drilling

ZAGREB Area, May/June 66

1. The Canadian Military Attache, on a road trip from Belgrade 25 May 1966, to SEZANA and return 17 June 66, observed what appeared to be oil well operations. (Ref. Map GS GS No. 4396 JUGOSLAVIA 1:100,000 Sheet 30)
2. Four structures that resembled oil-well towers were seen. Drilling operations were also seen in the same general area.

Locations

3. The area of these presumed oil-wells is WEST of the Autoput, beginning approximately 20 Kms SOUTH of ZAGREB, and continuing SOUTH another 50 Kms approximately in the SAVA River valley, ending approximately 300 Kms NORTH of BELGRADE.

Report & Date: IR 6/66 of 28 June 1966  
Source: CMA Belgrade

CONFIDENTIAL

851 B/CAN FOLDER

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DATE 25 June, 1966

# JOINT INTELLIGENCE BUREAU Ottawa

Communist Economic and Military Aid Activities

in the Underdeveloped Areas

June 1966



JOINT INTELLIGENCE BUREAU  
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OTTAWA, CANADA

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Communist Economic and Military Aid Activities  
in the Underdeveloped Areas

June 1966

PART I - ECONOMIC ACTIVITY

GENERAL

US Economic Aid to African Countries 1964/1965 and  
Cumulative US Aid since 1946

1. According to the Agency for International Development (AID) African countries received a total of \$328.7 million in economic assistance in fiscal year 1965 (July 1964/June 1965). Main recipient countries are listed below. (UNCLASSIFIED)

AFRICA	AID	FOOD FOR PEACE	EXIMBANK	OTHER	TOTAL (Mill US\$)	CUMULATIVE TOTAL AID SINCE 1946
ALGERIA	.6	13.9	-	-	14.5	161.9
CAMEROUN	5.1	-	-	.8	5.9	28.4
CONGO (LEOPOLDVILLE)	15.8	9.0	-	-	24.8	298.8
ETHIOPIA	7.9	.3	8.0	3.9	20.1	150.9
GHANA	-	-	-	-	-	165.5
GUINEA	12.8	8.2	-	1.0	22.0	69.4
KENYA	4.0	4.4	-	1.1	9.5	9.5
LIBERIA	15.2	.2	23.1	2.8	41.3	231.0
LIBYA	-	-	-	-	-	206.4
MOROCCO	10.8	22.4	-	.9	34.1	484.2
NIGERIA	25.7	.8	3.4	4.3	34.2	159.7
SOMALIA	4.4	2.9	-	.5	7.8	47.4
SOUTH AFRICA	-	-	-	-	-	154.1
SUDAN	-	-	-	-	-	89.4
TANZANIA	-	-	-	-	-	44.0
TUNISIA	17.8	34.2	-	1.2	53.2	449.3
OTHER	19.5	20.4	-	10.7	50.6	255.5
REGIONAL	10.1	.6	-	-	10.7	55.1
	149.7	117.3	34.5	27.2	328.7	3,051.0 MILLION

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SECRET  
CANUKUS EYES ONLY

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CANUKUS EYES ONLY

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- 2 -

AFRICA

Algeria

2. Algeria and Czechoslovakia have concluded a protocol which will govern trade and development co-operation during the next few years. The agreement is expected to speed up utilization of a Czech credit for \$15 million extended to Algeria in 1964. Plans were also made for a substantial expansion of trade between the two countries in the early nineteen seventies. The commodity exchange will involve Algerian natural gas worth \$700 million to be sold over a period after 1972 in exchange for Czech industrial goods. (CONFIDENTIAL)

3. Transportation of the natural gas to Czechoslovakia will be costly and it is not known yet how this will be accomplished. However, it is believed that Yugoslavia and Austria are also interested in Algerian natural gas and a consortium, including Czechoslovakia, may be formed to establish the necessary trading links. (CONFIDENTIAL)

Ghana

4. In previous years Communist China purchased all of its cocoa requirements from Ghana and last year purchased about 8,000 tons. This year, however Communist China paid cash for about the same amount of cocoa from Brazil and is unlikely to purchase Ghanaian cocoa this year. (CONFIDENTIAL)

Rwanda

5. Rwanda has concluded a cultural agreement with the Soviet Union, its first agreement of any kind with a communist country. (UNCLASSIFIED)

Somalia

6. The Soviet Union has agreed to extend Somalia a second commodity credit, valued at \$4.2 million, to finance the local costs of Soviet aid projects. Under a previous commodity credit for \$7.8 million, local costs were to be covered by the proceeds from sales of Soviet goods. However, the Soviet goods did not sell well and much of the revenue from the goods that were sold did not reach the government but remained in the hands of private merchants. (CONFIDENTIAL)

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SECRET  
CANUKUS EYES ONLY

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CANUKUS EYES ONLY

JIB(CAN) 17/66

- 3 -

7. The Somalia government is believed to be interested in importing Soviet petroleum products under the new commodity credit in the belief that petroleum sales can be controlled more easily and thus prevent a draining off to private merchants. (SECRET)

8. Previous Soviet economic aid to Somalia includes a \$44 million credit for industrial and agricultural development and a \$5 million grant extended in 1961. (CONFIDENTIAL)

#### Tanzania

9. Communist China and Tanzania have concluded an agreement to establish a joint shipping company. Under the agreement the company's initial capitalization will be about \$4.2 million and the line will operate two 10,000 ton vessels between Tanzania and the Far East, principally Communist China. According to Tanzanian government sources the initial capital will be supplied entirely by Communist China. Tanzania's half of the initial capital will be in the form of a Chinese interest-free loan repayable from Tanzania's share of the profits over a ten-year period starting in 1977. (UNCLASSIFIED)

10. Tanzania's Minister of Economic Affairs announced on 17 June, 1966 that Communist China had extended Tanzania an interest-free loan valued at \$5.6 million repayable in ten years beginning in 1971. China has also agreed to provide Tanzania with grant aid valued at \$2.8 million. The loan is reported to be utilized for agricultural and road projects which were to be financed through a UK loan, cancelled when Tanzania broke with the UK over the Rhodesian crisis. The Chinese apparently have agreed to provide cash to cover the local costs of the projects undertaken. Previous Chinese aid to Tanzania is estimated at \$42 million. (CONFIDENTIAL)

11. Tanzania and the Soviet Union concluded an economic aid agreement at the end of May, 1966 valued at \$19.6 million. The terms of the loan provide for interest at 2.5 per cent with repayment over 12 years starting after the completion of each project. \$3.4 million dollars of the credit will be provided by the Soviet Union in the form of commodities to be sold in Tanzania to generate funds for the local costs involved in the Soviet-sponsored projects. Projects to be financed under the Soviet credit include two small hydroelectric plants, a cement plant, a geological survey and veterinary centres.

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SECRET  
CANUKUS EYES ONLY

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CANUKUS EYES ONLY

JIB(CAN) 17/66

- 4 -

12. The new Soviet credit is almost identical in value and terms to the Soviet credit offered to Tanzania in 1964 but which was not officially accepted by Tanzania because the agreement did not provide for the complete financing of local costs by the Soviet Union, and an extended repayment period.

13. Since its break with the UK and the suspension of the UK aid programme Tanzania has been more receptive to Soviet aid.  
(CONFIDENTIAL)

Zambia

14. During a tour of East Africa, a Chinese Communist trade delegation visited Lusaka for a few days and reportedly received a warm welcome. However, there has been no confirmation of a New China News Agency report that a Chinese delegation had discussed the Tan-Zam railway project.  
(SECRET)

15. Zambia has not concluded any agreements with the Communist Countries although its contacts with them have increased considerably over the past eighteen months.  
(UNCLASSIFIED)

ASIA

Cambodia

16. Cambodia and Communist China are reported to have concluded an economic aid agreement during the visit of the Chinese Vice-Premier to Cambodia in April, 1966. The aid agreement finalizes Chinese aid offers made in 1964 and 1965 which have been under study since that time. The agreement is reported to provide for a credit valued at \$42.9 million which is to be repaid in commodities over a ten-year period starting in 1971. A third of the loan is to be used for the purchase of equipment from Communist China. The remainder is to be obligated for the purchase of raw materials in Cambodia and from third countries and to cover the local costs of projects implemented under the agreement. This is the first time that Cambodia. This is the first time that Communist China has included repayment terms in its aid agreements with Cambodia. All previous Chinese aid, valued at about \$50 million was extended as grant aid.  
(CONFIDENTIAL)

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SECRET  
CANUKUS EYES ONLY

SECRET  
CANUKUS EYES ONLY

JIB(CAN) 17/66

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India

17. According to a statement made by India's Minister for Planning, India hopes to receive additional aid ranging in value from \$750 million to \$1 billion for its fourth five-year plan from the Soviet Union and the East European communist countries. The Minister for Planning visited Moscow in June, 1966 and is reported to have discussed the pattern of Soviet aid for India's development plan. Similar discussions are scheduled to be held in five other communist countries, including Poland, Hungary, Czechoslovakia, Roumania, and Yugoslavia, during October 1966. India has already received an estimated \$1.3 billion in economic aid from the Soviet Union and the East European communist countries. (CONFIDENTIAL)

MIDDLE EAST

UAR

18. According to a press report dated 12 June Soviet Premier Kosygin is reported to have "confirmed to President Nasser" the extension of a Soviet loan valued at \$165 million for the UAR's second development plan. The news report stated that this credit was discussed during Kosygin's recent visit to the UAR, although the communique issued at the end of the visit made no reference to additional Soviet economic aid for the UAR. It may well be that Kosygin was not empowered to agree personally to a loan of this magnitude and that the final decision was made in Moscow. Khrushchov is known to have been criticized for his off-hand extension of \$280 million to the UAR prior to his ouster in 1964. Recent developments in the Soviet economic aid programme suggest that many of the recent aid extensions are the result of more careful deliberation. Including the new loan the value of Soviet aid to the UAR is now estimated at \$1,175 million. (CONFIDENTIAL)

19. It has now been disclosed that the largest of the new projects included in a revised protocol to the 1964 Soviet economic cooperation agreement, which was signed in February, 1966, is a new oil exploration programme. It is estimated that about fifty per cent of the \$100 million made available by project cancellations will be utilized for this purpose. The Soviet Union previously supplied the UAR with drilling rigs and oil exploration equipment. (CONFIDENTIAL)

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SECRET  
CANUKUS EYES ONLY

SECRET  
CANUKUS EYES ONLY

JTB(CAN) 17/66

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Turkey

20. After about 20 months of negotiations the Soviet Union is reported to have given Turkey until August, 1966 to decide whether it will proceed with development projects which the Soviet Union has offered to finance under a loan to Turkey valued at \$200 million. The projects sponsored by the Soviet Union include an aluminum plant, a fiber-board plant, a sulphuric acid plant, a glass factory and a steel plant. Turkey, reportedly, has emphasized that it proposes to ensure, before taking any decision, that all the Soviet plants offered are competitive in techniques, prices and delivery with these available from other countries. (UNCLASSIFIED)

Syria

20. The Syrian Minister of Industry has announced that Communist China has offered to re-extend a loan for \$5.8 million first negotiated in 1962 but not utilized by Syria. The current Chinese proposal provides for the construction of 50,000 spindle yarn spinning factory. (UNCLASSIFIED)

LATIN AMERICA

Uruguay

21. According to a recent news report from Montevideo the Soviet Union is reported to be willing to provide financial and technical aid for the Salto Grande hydroelectric power plant. The report pointed out that the Soviet offer of aid was not limited to the Salto Grande project and included the opportunity for increased Uruguayan exports to the Soviet Union in return for Soviet petroleum products. (UNCLASSIFIED)

Chile

22. A Soviet economic mission which is now in Chile has offered technical aid and credit up to \$60 million to establish private as well as public industrial enterprises. (UNCLASSIFIED)

...../7

SECRET  
CANUKUS EYES ONLY



SECRET  
CANUKUS EYES ONLY

JIB(CAN) 17/66

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PART II

MILITARY AID

MIDDLE EAST

Cyprus

Missile Training in UAR

23. In para. 1 of JAWG Brief 6/66 it was reported that, according to U.S. information, an additional 226 Greek Cypriots had gone to the UAR for missile training. It has now been reported by the Canadian Forces Adviser, Nicosia, that in fact 216 Cypriot National Guard reservists, all either university graduates or having technical backgrounds, were flown to the UAR on 20 and 22 May 1966 for suspected missile training, probably on the Soviet-supplied SA-2 surface-to-air missiles which were provided to Cyprus in 1964 but are still stored in the UAR. According to the report the 133 Cypriot technicians, who were reported to have gone to the UAR late in 1965, are still undergoing missile training and are now expected to complete their training in August. This brings the total of Greek Cypriots who are probably receiving SA-2 training to 349. An earlier Canadian report, dated January 1966, suggested the likelihood that the 150 SA-2's stored in Alexandria were to be brought to Cyprus in June and that three missile sites were to be established in the summer of 1966; there has been no indication yet of the movement of these weapons to Cyprus and the Canadian Forces Adviser thinks it likely that they will arrive by August 1966. (SECRET)

Iraq

Soviet - Iraqi Arms Agreement

24. Information is now available on the arms agreement signed between Iraq and the USSR early in May, the fifth major agreement between the two countries. Under the new agreement Iraq is reportedly to receive 34 SU-7/FITTER tactical fighters (including two trainers), 16 more all-weather MIG/21/FISHBED fighters (Iraq now has over 30 MIG-21's, including 18 of the all-weather variant) and one MIG-21 trainer, search radar, and twenty 130 mm anti-aircraft guns. 105 T-55 tanks are also to be acquired and the navy is to receive eight probable KOMAR-class guided-missile motor gunboats, eight minesweepers and one sub-chaser. (SECRET)

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SECRET  
CANUKUS EYES ONLY

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SECRET  
CANUKUS EYES ONLY

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Syria

Visit of Defence Delegation to USSR

25. According to a British report only recently available, during the visit of a high level Syrian delegation to Moscow in April the Syrian Minister of Defence discussed Syrian arms requirements at length with Marshal Malinovsky. He is reported to have received assurances from the Soviet Defence Minister concerning the supply of MIG-21/FISHBED's, tanks and heavy artillery, said to be the items in greatest need. Relatively small scale and routine deliveries of Soviet arms have been occurring in recent months, probably under the 70 million dollar (US) general agreement of October 1964 and a supplementary agreement of unknown value of March 1965. No new arms agreement is known to have been signed as a result of the April visit. (SECRET - CANUKUS EYES ONLY)

AFRICA

Somalia

Further Sizeable Arms Shipments

26. A further sizeable shipment of arms arrived from the USSR in mid-June, aboard the freighter FAYZABAD. The cargo included 15 BTR-152 armoured personnel carriers, seven electronic vans and 15 to 20 truckloads of ammunition. This is believed to be at least the seventh Soviet arms cargo to arrive in Somalia since mid-December 1965 and these deliveries are probably still being made under the 1963 military aid agreement. (SECRET - CANUKUS EYES ONLY)

ASIA

Pakistan

Military Mission to USSR

27. A senior Pakistani military delegation, led by the Chief of the Air Staff, left for the USSR on 25 June and was still there at the end of the month. There have been various press and diplomatic reports that the mission was to discuss arms procurement from the USSR

/and that the

...../9

SECRET  
CANUKUS EYES ONLY

SECRET  
CANUKUS EYES ONLY

JIB(CAN) 17/66

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and that the Soviet Union was willing to supply arms to Pakistan, but as of the time of writing no firm evidence has been received as to whether or not an arms agreement was discussed. It is possible that the USSR would offer arms aid to Pakistan, despite some risk of jeopardizing their relations with India, in order to maintain some balance in its relations with both Pakistan and India and not to leave the field clear for the Chinese.

(CONFIDENTIAL)

Indonesia

28. Indonesia is the Soviet Union's leading debtor among all the recipients of Soviet aid to the less developed countries, mainly because of the military aid received, and, according to a U.S. estimate, as of mid-1965 accounted for nearly half of the total outstanding indebtedness of all the less developed countries for Soviet military aid. Arms debt repayments were rescheduled in 1963 but Indonesia has still not been able to keep up with the revised schedule of payments.

(SECRET - CANUKUS EYES ONLY)

SECRET  
CANUKUS EYES ONLY

SECRET  
CANUKUS EYES ONLY

JIB(CAN) 17/66

TABLE I  
Communist Economic Aid Extensions  
1 January - 30 June 1966

By	To	(Million \$US)		Total
		Project Aid	Other Loans	
Soviet Union	Cameroun	7.7		7.7
	Iran	290.0		290.0
	Pakistan	20.0		20.0
	Syria	140.0		140.0
	Somalia		4.2	4.2
	* Turkey	33.0		33.0
	UAR	165.0		169.2
		<u>655.7</u>	<u>4.2</u>	<u>659.9</u>
Czechoslovakia	Pakistan	70.0		70.0
		70.0		70.0
Hungary	India	52.5		52.5
		52.5		52.5
Bulgaria	Syria	15.0		15.0
		15.0		15.0
	TOTAL	<u>793.2</u>	<u>4.2</u>	<u>797.4</u>

\* The value of the Soviet loan to Turkey in 1965 has been revised upward to \$200 million, an increase of \$33 million.

SECRET  
CANUKUS EYES ONLY

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April, May 1966  
DATE                     

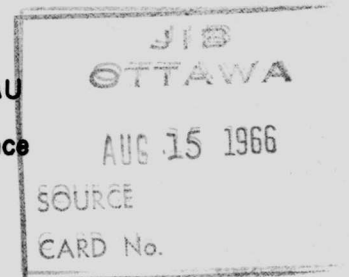
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(ii)

GLOSSARY

ASSR	Autonomous Soviet Socialist Republic
CPSU	Communist Party of the Soviet Union
Gosplan	State Plan
Kray	Administrative Region
Lespromkhoz	Timber Industrial Complex
NP	North Pole
Oblast'	Administrative Region
Okrug	Administrative Region
PINRO	Polar Scientific Research Institute of Fisheries and Oceanography named after N.M. Knipovich.
Rayon	Administrative Territorial Subdivision
RSFSR	Russian Soviet Federated Socialist Republic
Sovnarkhoz	Regional Economic Board

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## AGRICULTURE & FISHERIES

### Murmansk

The photo shows a pair of PINRO laboratory workers putting the finishing touches on preparations for scientific work on board the expeditionary ship Tunets in the Barents Sea. They are completing installation of underwater cameras and equipment which will be used to study fish at depths down to 300 meters.

Vodnyy Transport  
24 May 1966  
Page 4  
(Summary)

### According to the Five Year Plan

Tyumen. Meadow improvement has been started on the lower reaches of the Irtysh river. Fifteen mechanized-amelioration stations are working on the project. More than 700 tractors, stubbers, brushers, bulldozers, excavators and other machines are in use.

Agreement was reached this year between the stations and nearly all the economies in the Oblast'. Specialists say that the entire swampy area on the lower Irtysh river will be drained by the end of the current Five-Year Plan and will yield millions of tons of hay annually. Later on these lands will be suitable for cropping.

Izvestiya  
25 May 1966  
Page 1  
(Full text)

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ARCTIC

Expedition "North-18"

This expedition has set up a new ice floe station "North Pole-15" and is transferring materials to it from NP-14, which will soon be closed down. The station transmitted a weather report from position 78°-49' n. lat. 168°-13' e. long.

Unmanned weather-reporting stations of improved design will be left at the site of the former NP-14. Similar stations have operated for over a year from ice floe NP-12.

NP-13, which is now located in the vicinity of 82°-26' n lat. 133°-07' e long is being handed over to a new commander.

Vodnyy Transport  
26 April 1966  
Page 4  
(Extract)

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copy  
pp 3-16

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## ECONOMIC DEVELOPMENT

### THE GREAT OILFIELDS OF THE TYUMEN'

Extremely rich deposits of oil and gas lie buried beneath the Soviet Union. According to prognoses, the USSR leads the world in reserves of these very valuable minerals. At the present time about 12 million square kilometers of our country (including the seas) are worth exploring for oil and gas deposits.

Geological exploration operations, particularly those carried out in the post-war period, have resulted in the discovery of huge deposits and entire oil and gas provinces. This has made it possible to develop our oil and gas industry at a high rate.

Whereas ten years ago we extracted a little more than 70 million tons of oil and 9 billion cubic meters of gas, in 1965 the national economy received 243 million tons of oil and 129.2 billion cubic meters of gas. Thus, during that period oil production was more than tripled in the Soviet Union, and that of gas rose by 14 times. This has made it possible to more fully meet the growing need for fuel by the national economy and significantly expanded the volume of oil and petroleum product exports.

The course of accelerated development of the oil and gas industry, embarked upon by our Party, is being successfully put into practice. The ratio of oil and gas in the fuel balance of the country has been raised from 23.5% in 1955 to 52.1% in 1965, and this has made it possible to save the national economy many billions of roubles.

It is planned to raise the extraction of oil to 264 million tons during the first year of the five year plan, and to raise gas production to 148 billion cubic meters; this will raise their ratio to 53.5% of the total fuel production.

The Soviet Union has had a firm hold on first place in the world in rate of development of the oil and gas industry for a long time. This has made it possible to greatly reduce the gap between the USSR and the USA in oil and gas production.

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If we continue to develop the oil industry at least at the same rate, not to mention further growth (and measures will be taken during the current five year plan for this purpose), then by the end of 1970 we will have raised oil production to 345 or 355 million tons and will have nearly reached to-day's production levels in the USA (while in gas production we will have reduced the gap to less than half of what it is).

The entire course of development of the oil and gas industry in the USSR shows that the rapid growth of production volume is inseparably bound to the timely prospecting and development of new large oil and gas fields, increasing the volume of drilling operations and improvement of equipment and techniques.

Prior to the great Fatherland War, oil and gas production were mainly concentrated in Azerbaydzhan and in the Northern Caucasus. During the post-war years, new large oil producing centers were established between the Volga and the Urals; in Tartary, Bashkir, and the Kuybyshev and Perm' Oblasts. Right now, more than 2/3 of all the oil production in the country is concentrated in that enormous territory which is called the Second Baku.

A considerable role has also been played by the development of a number of large deposits discovered in the Turkmen, the Eastern Ukraine, Checheno-Ingushetiya, Stavropol'skiy Kray and Azerbaydzhan (Caspian Sea).

A great geological achievement was the discovery, in 1961, of a great oil and gas district on the Mangyshlak peninsula (Western Kazhakhstan).

The first gas-well in Siberia was brought-in during 1953 in the lowlands along the Ob' river near the village of Berezovo, while in 1960 the first Tyumen' oil flowed from a well drilled in the silent taiga on the banks of the Konda river at the village of Shaim.

In 1961, oil was discovered in the central part of the West Siberian Plain (near the settlement of Megion).

The discovery of oil deposits in the vicinity of the Verkhne-Chusovskiye Gorodki in 1929 aroused interest in the mineral wealth of the West Siberian Plain.

Academician I.M. Gubkin, while addressing a session of the Urals branch of the Academy of Sciences in 1932, expressed the opinion that there were great reserves of oil and gas beneath the West Siberian Plain. This suggestion did not get much support. Although a search was begun for Siberian oil then (or on a small scale), until just recently the entire territory from the Urals mountains to the Yenisey river and the shores of the Pacific Ocean remained an enormous white spot on the map of oil deposits.

Now the oil map for only the Tyumen' Oblast shows more than 52 oil and gas deposits.

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Geologists, geophysicists and drillers played an important role in the discovery of this oil and gas province, and a number of the people involved were decorated.

The West Siberian Plain is one of the most promising oil and gas regions of the earth, it occupies a territory of over 3 million square kilometers.

A geological section of the plain shows a two-stage structure. It stands on a foundation of thick ancient pre-Palaeozoic and Palaeozoic metamorphosed rocks overlain by a complex of Meso-Cenozoic sedimentary deposits, mainly arenosargillaceous (terrigenous) rocks. The thickness of this rock section within the West Siberian Plain increases from the margin towards the central part where it is more than 4 thousand meters.

The discovery of oil and gas deposits in the West Siberian Plain has both practical and theoretical value, since it permits clarification and development of the accumulated ideas concerning the conditions under which oil and gas deposits were formed.

The main producing horizons are confined to deposits of various age at different places in Western Siberia; also, sediments of the same age in some regions contain only oil, in other regions they contain only gas, and in yet other regions they produce both oil and gas. There are essential differences in the conditions under which the minerals occur in various regions. An individual approach is therefore necessary for prospecting, exploration and development of deposits lying within the confines of each of the regions.

Right now it is necessary to quickly determine the possibilities of this large basin in order to be able to correctly outline the method of exploitation, and to solve all the problems associated with its development. To this end it is necessary to drill, throughout the whole territory of Western Siberia and mainly in the most promising regions, a network of test holes in order to quickly determine the "face" of Western Siberia.

The regions in which oil and gas deposits are being exploited extend north of the 60th parallel. The climate here is continental, a long harsh winter and a short, comparatively warm summer. The mean annual temperature is  $+0.6^{\circ}\text{C}$ . The mean daily air temperature from January through March is  $-22$  to  $-25^{\circ}$ , but there are days when the temperature drops to  $-50$ . The mean temperature of the warmest month, July, is  $+18^{\circ}$ , and on individual days the thermometer frequently indicates  $+35^{\circ}$ . The snow falls at the end of October and goes at the end of April.

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I have been there twice with a group of specialists: in January and in August of 1964. We saw the conditions under which the oilfields were being developed both during the winter and the summer. Many of the deposits occur in difficult accessible, swampy localities, which are covered with a thick layer of peat, and some of them are situated in the permafrost zone. There are considerable difficulties associated with the development of such deposits.

However, the development of oil and gas fields in the Tyumen' and other Oblasts of Western Siberia is economically feasible and, with present day technical means, the difficulties are surmountable. In this sense the gathering of experience and expending our knowledge concerning the features of the West Siberian Plain are of primary importance.

The Western Siberian oil and gas district is an enormous storehouse of fuel: obviously, there are billions of tons of oil and trillions of cubic meters of gas here which can be brought to the surface. This provides the necessary realistic conditions on which to organize one of the country's main oil and gas sources in Siberia. In the next few years, West Siberian oil will fully meet the needs of Siberia and the Far East, while the gas will significantly improve the fuel situation in the Urals and in the European part of the country.

One important problem, which arises at the beginning of exploitation of any oil (or gas) field, is that of transporting the fuel.

The construction of trunk oil pipelines was begun in Western Siberia in 1964. In 1965, the first stage of the oil pipeline from Shaim to Tyumen' was opened, it is 436 kilometers long. Oil is transported along it to Tyumen', and from there it goes by railroad. Later on the oil pipeline will be extended and connected to the trans-Siberian trunk pipeline.

The largest trunk pipelines for moving oil to the refineries of Western Siberia, the Far East, and the European part of the USSR and for export will start at the Surgut group of oilfields.

Construction is proceeding rapidly on the one thousand kilometer long oil pipeline from Ust'-Balyk to Omsk. It will go to the southwest, across the recently opened Pravdinskoye (Salymskoye) deposit, and will then emerge at the Irtysh river and will run along it to the Omsk oil refinery where it will join the trans-Siberian oil pipeline. Planning has begun on a pipeline from Ust'-Balyk to Bogotol, a considerable part of this line will follow the middle course of the Ob' river.

All the groups of oil deposits discovered in the Tyumen' and Tomsk Oblast's will be connected with these large oil pipelines.

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Oil pipelines will be built in the future to the north and northwest towards Omsk and Bogotol as the volume of oil production increases.

As you know, the USSR has built an oil pipeline to Irkutsk. Its terminal part, from Krasnoyarsk to Irkutsk, went into operation in 1964 and oil from Bashkir and Tataria now flows along it to both the Omsk and the Angara oil refineries.

It is intended to meet all the oil requirements of Western and Eastern Siberia from the Tyumen' deposits in the next seven to ten years, and deliver Bashkir and Tataria oil to the west. Tyumen' oil will soon flow along the trans-Siberian pipeline to Angarsk. The time will come when Siberian oil will flow to the refineries in the Bashkir, at Kuybyshev and beyond along the "Druzhba" oil pipeline to socialist countries.

A few words will now be said concerning gas pipelines.

The first industrial gas from Siberia went to the Urals along the gas pipeline from Igrim to Serov, more than 500 kilometers long, the construction of this pipeline was completed at the beginning of February 1966; this gas pipeline will next be connected to the trunk line from Gazli to Ural. A new large trunk line will feed Ural with low cost fuel from Uzbekistan and Tyumen'; its total length will come to more than 3 thousand kilometers.

The gas pipeline from Igrim to Serov will have a daily capacity of 10 billion cubic meters of cheap natural gas, which is equivalent to approximately 15 million tons of Urals coal. Siberian gas will make it possible to save considerable resources and to raise the productivity of labor at many enterprises. The Nizhne-Tagil' metallurgical combine alone will increase the smelting of cast iron by hundreds of thousands of tons per year; steel production will also increase at other metallurgical plants in the Urals. Cement plants will show a significant increase in production.

The cost of building the Igrim to Serov gas pipeline will be quickly recovered: according to preliminary estimates, its operation during the Five-Year Plan will give the country a saving of 4 billion roubles, which is equal to all the capital investment in the gas industry of the country during the Seven-Year Plan.

Still another large gas trunk line will be built: this one from Tazovo to Center. Tyumen' gas will be delivered to many areas of the Soviet Union and the Western Siberian deposits will become a dependable stockhold of the country.

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A pressing and very important matter is the construction of railroad lines from the main arteries to the oil and gas fields of the Tyumen'. Otherwise, it will be impossible to rapidly exploit the riches of the region. It is impossible to rely on the delivery of an enormous amount of freight by water routes, particularly in the comparatively short navigation season. For this reason railroads are being built from Ivdel' to Ob', Tavda to Sotnik and a main railroad from Tyumen' to Tobol'sk to Surgut which will pass through large oil deposits (Pravdinskoye, Yuzhno-Balykskoye, Mamontovskoye, Ust'-Balykskoye and farther on to the village of Aleksandrovskeye).

Vehicular road construction has quite a few problems also, mainly on local roads that will connect neighboring deposits. The construction of roads under swampy conditions requires complicated techniques. Until highways are built, freight will continue to be moved by winter roads which operate successfully from December through March inclusively. More than 7 thousand tons of freight was moved by such roads last winter.

The development of the oil and gas industry in the Tyumen', particularly during the present period when railroads and highways are not completed, depends to a great extent on the operations of the air fleet, it is the decisive factor in communications and shipments during the winter period. It is therefore necessary to build airdromes for aircraft and helicopters at a number of remote places.

There is obviously no need to point out the importance of creating a powerful energy system in the oil and gas regions. The existing electric power stations in Western Siberia are small, they are at a considerable distance from the oil and gas regions and cannot be used for supply of electric power to these regions. It is therefore vitally important that a large thermal electric power station be built in the vicinity of Surgut, which would operate on natural and waste gas. It will also certainly be necessary to build a large electric power station operating on natural gas in the vicinity of the Berezovo gas wells. Until these stations are built it is intended to give life to the oil regions by increasing the capacity of the electric power station at Tyumen' and transmit energy from there to Surgut.

I will mention still another problem in creating an energy base.

The oil-men have different views from those of the hydro-men concerning the construction of the lower Ob' hydroelectric power station in the vicinity of Salekhard. The station dam will raise the water level to the 30 meter mark. As a result a considerable part of the oil-bearing region will be inundated. At the moment there is no data from an accurate topographical survey and it is impossible to say how large an area and to what level it would be inundated in the event the power station is built. It will not be possible to answer all these questions until exploratory operations

/have been completed

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have been completed over the entire territory intended for inundation (this will evidently be in mid-1966). If a very large area goes under water, then the expenses associated with developing the oil and gas deposits will be very high and the construction of the power station will not be profitable.

Exploration and development of the Tyumen' oil and gas deposits requires maximum utilization of the foremost experience available at home and abroad. This will make it possible to overcome great difficulties with the least amount of effort and means. These difficulties have already been encountered in the exploitation of the resources of Western Siberia, and it is desirable to extract the maximum amount of oil from beneath the Tyumen' at the lowest possible cost.

Large-scale application of methods for maintaining the pressure in the oil-bearing beds must be introduced right at the beginning of operations, i.e., simultaneous separation while drawing oil from several horizons and simultaneous separate charging of water through a single bore-hole, power regulated centrifugal pumps, a single pipe system for taking oil and gas and a number of other advanced methods.

Sinking of wells in swamp-covered deposits requires a solution to the problem of building communication lines to them, application of inclined drilling techniques, creation of special, quickly assembled and dismantled drilling rigs that are equipped with light-weight pipes and highly efficient bits.

A few words first of all about the method of maintaining bed pressure. It consists of injecting water (or gas) into the free space outside the limits of the oil-bed while the deposit is being exploited. At large oil deposits, where addition of water beyond the limits of the bed does not produce the required effect, intra-bed addition of water is also used. This makes it possible to artificially maintain pressure in the bed, to increase the period the well is gushing and, during that time, to obtain cheaper oil. In addition, there is rapid and complete extraction of the oil from the bed.

It is known that the application of this highly effective method has played a decisive role in increasing oil production in our country.

In 1965, the deposits exploited by means of maintaining bed pressure produced 166 million tons, or about 70% of all the oil production.

A clear example of the effect of this method on the improvement of quantitative indices of oil production may be seen, one of the largest oil deposits in the world at Romashkinskoye (Tatarskaya ASSR). Here, for the first time in world practice, extra-contour and intra-contour addition of water was used in combination with a sparse network of wells.

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Estimates show that application of only extra-contour addition of water at the Romashkinskoye deposit would limit the maximum level of oil production to 7 million tons and exploitation of the field would take hundreds of years. The introduction of intra-contour addition of water in combination with extra-contour addition made it possible to raise the level of oil production to approximately 60 million tons.

It must be taken into consideration that, if the bed pressure is permitted to decrease, this would cause the wells to stop gushing and would make it necessary to operate them by mechanical means, which results in unnecessary increase in capital construction and approximately doubles the cost of oil. Consequently, the on-site construction of pumping stations, water reservoirs and pressure pipelines must be undertaken simultaneously with the construction of oil and gas networks and other structures.

An important engineering method which greatly reduces the expenditure of materials and finances during drilling and operation of wells is the simultaneous separate drawing of oil (or gas) from several beds through one well, along with the simultaneous, separate addition of water to several oil-beds through the same well.

So far, this method has not been sufficiently widely exploited in this country.

In Mexico, which we visited recently, we found that out of 500 wells drilled into a multi-layer deposit, more than 330 were operated in this manner. This practice is also widely followed in Venezuela and other countries.

A number of large oil deposits in the Tyumen' are multi-layered. Consequently, it is necessary to introduce this advanced method as quickly as possible in order to avoid unnecessary expenses.

The saving in finances and metal by drilling wells equipped to simultaneously draw oil from two beds amounts to 30 to 45%, and the greater number of beds exploited through one well the greater the saving.

Another example is the Ust'-Balik deposit. By universally applying the above-described method of drawing oil from all three beds, the number of producing and charging wells should amount to 235 instead of the 450 required to exploit the bed by independent wells. As a result, at this one oilfield alone there would be a saving of about 500 thousand meters of wells costing approximately 38 million roubles, there would be a saving of 16 thousand tons of various piping and a large decrease in the cost of oil per ton.

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Experience has shown that after the wells have stopped gushing the most efficient way of bringing oil to the surface is by the use of electro-powered centrifugal pumps which have a wide range of operation and do not require special foundations for installation.

Electro-powered pumps will be practically the only type of equipment in use for mechanized operation of oil wells in the Tyumen'.

Wells will be slant-drilled in clusters at oil and gas deposits in swampy localities in order to make development easier. This will greatly reduce the number of drilling areas if combined with simultaneous separate drawing of oil from several beds through one well.

The advantages of this method (it is widely used in the development of oil deposits in the Caspian Sea) have been demonstrated in the Ust'-Balyk deposit. To achieve the given volume of oil production it would be necessary to drill 700 wells. If these wells were drilled vertically it would be necessary to move the drilling equipment from each of the 700 points. In the event that the clustered slant-drilled method is used (with simultaneous separate drawing of oil from two beds through one well) it is necessary to drill only 490 wells from 35 to 45 points instead of 700.

In order to prevent the yearly flooding of wells during high water, it will evidently be necessary to construct metallic or reinforced concrete pedestals for the mouths of the wells.

In swampy areas it is possible to construct artificial alluvial (or dumped or using controlled blasting) islands from which to drill vertical and slant-wells.

According to preliminary estimates, the building of such structures can be economically feasible where the depth of thawing is not greater than 3 or 5 meters (experience has shown that most of the swamp territory in the Tyumen' Oblast is up to two meters and sometimes three meters deep.)

The construction of such bases is very simple, particularly when the bottom of the swampy territory is composed of sandy soil (as is the case at the Tyumen' deposits), since it is then not necessary to carry on any special quarrying of sand.

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I think it would be worth-while testing the method developed in Mexico for developing swampy deposits to see if it could be applied to the Tyumen'; in this method a system of canals is dug by means of dredges. Shallow draft boats transport the drilling and operating equipment along these canals. The rate of digging the canals to a width of 20 meters and a depth of 2.5 meters can be as high as 50 meters in a 24 hours period (using two shift operation). Drilling is carried out from special barges in the canals. Before the start of drilling the barge is sunk. Drilling a well to a depth of 23 hundred meters from such a base usually takes two months. After a cluster of wells has been drilled the ballast is off-loaded from the barge when it again floats and is moved to a new location.

Sinking the wells, i.e., drilling, is the most important stage in developing the productive capacity of the oil and gas producing industry. The cost of drilling exploratory and operational wells amounts to approximately 40% of the total capital investment.

In the Tyumen', drilling takes on particular significance, if we take into account the enormous volume of these operations and the specific conditions under which they are carried out. It will be necessary to drill more than 6.5 million meters of exploratory and operational wells in this area during the Five-Year Plan.

The success of the venture will be decided by the high rate of drilling the wells and high productivity of the drilling equipment.

In order to achieve a very high rate of drilling it is very important to select the most efficient types of equipment and instruments. Evidently, the most suitable drilling rig for Siberian conditions is the BU-75 BrM with a three-diesel drive. Prototypes of these rigs have been tested under Tyumen' Oblast' conditions and have shown satisfactory results. Drilling rigs, derricks and instruments should be made of strong aluminum alloys in order to reduce their weight.

Drilling pipes of aluminum should also be widely used. Due to the reduction in pipe weight by nearly 3 times (in comparison with steel) the time for completion work on a site will be reduced by 30 or 40%. In addition, the use of such pipes will greatly reduce labor, significantly reduce the expenditure of energy and fuel and lubricants, brake shoes and tackle, and will reduce transportation costs. In the final analysis all this results in a reduction of the cost of drilling per meter.

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As is well known, turbine drilling has brought about a revolution in the development of our oil and gas industries. More than 80% of all the wells in the country have been sunk by this method. Turbo-drills have given a good account of themselves under drilling conditions in the Tyumen' Oblast as well. All that remains is to supply the drillers with powerful and good quality equipment.

The growth of oil production in the Tyumen' Oblast requires an enormous amount of work for equipping wells, equipment for collecting and intra-industry transport of oil and the accompanying gas, water and heat supply, construction of intra-industry and trunk roads, productive and repair bases, towns, settlements etc.

The construction method used in Tartary, Bashkir and other regions cannot be applied to the deposits in the Tyumen' Oblast. These methods would be costly and would not provide a rapid rate of growth in oil production. Lightweight shell structures are required which could be used to provide gas compression, oil pumping, water pumping stations, drilling bases and all the other structures which make up a complete oil industry complex.

A much labour and material consuming operation in the oil and gas industries is the construction of the various pipelines. In roadless conditions and large areas of swampy terrain the work is even more complicated, and in permafrost conditions it is necessary to take a completely different approach and to use other engineering methods.

To ensure maximum economy of finances and metal, as well as to overcome losses in accompanying gas it is necessary, when erecting the structures at the oilfield, to install the proven single-pipe pressure system for collecting gas and oil, which excludes separation of gas and oil immediately at the wells. This process must be carried out in groups which include up to 50 wells. After the first separation has been carried out the gas-saturated oil is transported to the refinery.

It is necessary to achieve maximum simplification of the system for preparing oil at the sites. For example, it is not worth installing stabilization apparatus here, and the preparation of the oil should be confined to the process of separating it from water by thermo-chemical means. The apparatus we are speaking of could expediently be set up at the trunk oil pipeline pipehead.

The oil and gas deposits that have been discovered are situated in and sparsely populated areas. A large number of people will be asked to come here from other parts of the country to work.

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It will evidently be expedient to construct large communities and towns for their settlement, these would be designed to serve a group of oil deposits and would be connected by excellent roads. This will make it possible to avoid building small settlements at each oilfield, where living conditions are worse.

The plans for towns and settlements also include the provision that the workers at individual fields which are situated in difficultly accessible regions would have their permanent dwellings in the main population points and would go out to the oilfields on special details as is done in the Baku at the marine oil sites. Small settlements of the hostel type will be built immediately at the oil well sites for accommodation of the workers during their stay on the site.

This has been a far from complete coverage of all the problems arising in connection with the development of the huge Tyumen' oilfields.

In conclusion, it will be stated that, in 1965, the plan was to deliver 700 thousand tons of Tyumen' oil to the oil refineries, but in actuality about 1 million tons were produced. This was a wonderful present from the young Siberian-oilmen collectives to the XXIII Congress of the CPSU.

Without doubt, all the difficulties in developing the "oil and gas virgin lands", the development of the Tyumen' riches, will be successfully overcome. The guarantee of this success is the heroic labor and creative energy of the glorious army of oilmen and the enormous assistance given them by the country. The author of this article was: N.K. Baybakov, Chairman of the Gosplan, USSR.

Nauka i Zhizn'  
Vol 3, 1966  
(Full text)

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# INDUSTRIAL RESOURCES USSR





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Thermal power stations

Hydro-power stations

Gaslines

Canals

Oil refining

Chemical industry



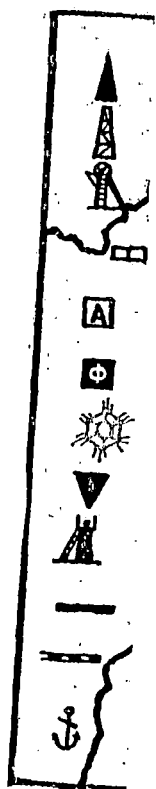
Non ferrous metallurgy

Timber-industrial complexes & combines

Textile and light industries

Food industry

Rail ferries



Oil

Natural gas

Coal

Shale

Aluminum

Phosphor products

Diamonds

Ore deposits and concentrating mining combines

Ferrous metallurgy

Oil pipelines

Railroads under construction

Building and reconstruction of ports

Ekonomicheskaya Gazeta  
No. 16, April 1966  
Page 24

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### In the Taymyr

The discovery of natural gas deposits in the Taymyr is resulting in great economic advantages when the Norilsk, Dudinka and Igarka industries are converted to gas fuel.

But the wealth of the Taymyr does not lie solely in its depths. The reindeer is the mainstay of the indigenous population. Estimates show that the Taymyr could support about 300 thousand reindeer, or triple the present number.

Unfortunately, reindeer meat has not caught on as staple fare in the cities and towns of the Krasnoyarsk Kray and, consequently, there is very little demand for this meat product outside the native settlements.

The main reason for this lack of popularity is the high cost of transporting reindeer meat from the artels to the industrial cities. Distributors who have handled this product in the cities did so at a loss.

Ekonomicheskaya Gazeta  
April, 1966  
Page 36  
(Extracts)

### Votkinsk Hydroelectric Power Station

The Votkinsk Hydroelectric Power Station has been commissioned. This station supplies power to the Perm' and Sverdlovsk Oblast's, Bashkiriya, Tartary and Udmurtiya. The one million kolowatt station was completed a year ahead of schedule.

Izvestiya  
29 April 1966  
Page 4  
(Summary)

.../18..

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### 90 Sunny Days

The Port of Tiksi is open to navigation for a limited time each year. This port is busier than any other in the north during the summer.

Tiksi is the polar city of the future. It now has a population of nearly 10,000. It has one of the Arctic's best hospitals and a large laundry. Three-storey buildings rise above the permafrost.

A four-storey building will be started this summer, the first on the Arctic coast. By the end of the Five-Year Plan, nearly all the residents will have well-built apartments.

A modern air terminal will be opened here this year, as well as a department store and restaurant.

Trud  
4 May 1966  
Page 4  
(Extract)

### Fluffy Walls

The Kil'ginstroy (Near Murmansk) building materials plant is turning out polystyrene foam articles of high thermal and acoustic insulating properties for use in the construction industry and other branches of the economy.

The material is now being shipped to Kandalaksha and will be delivered to Norilsk when the shipping season opens.

Sovetskaya Rossiya  
7 May 1966  
Page 2  
(Summary)

### Polar Record Set

Vorkuta: the crew bossed by Vasilii Koptelov in pit No. 27 dug 68,240 tons of coal in 31 work days using a Tula-4 combine. The All-Union record was beaten by 14 thousand tons. The cost per ton came to 62 kopeks.

Sovetskaya Rossiya  
11 May 1966  
Page 1  
(Extract)

.../19..

000818

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### Pylons over the Taiga

Work is proceeding ahead of schedule on the high-voltage transmission line from Zelenyy Mys to Bilibino, Magadan Oblast'. The hundredth pylon was raised today.

Izvestiya  
14 May 1966  
Page 4  
(Summary)

### The Kolyma Needs its own Timber Industry

Appropriations for capital construction (mainly dwellings and cultural-welfare facilities) for the Verkhnekolymskiy rayon have been increased over last year's by  $1\frac{1}{2}$  times.

At the present time, timber to meet this growing demand is shipped to the Kolyma from the Lena river at a cost of 123-163 roubles per cubic meter. The high cost of housing is evident from these figures.

In addition, losses in route amounted to 238 thousand roubles last year.

It is hardly necessary to ship lumber over such great distances when the Verkhnekolymskiy rayon has its own abundant supply of timber.

The Central Lespromkhoz is being organized at Ust'-Omchyga, in the Magadan Oblast', more than 1,200 km. away. It is possible this year, using available data, to solve the problems associated with building a lespromkhoz on the Kolyma river.

Economicheskaya Gazeta  
No. 18, May 1966  
Page 28  
(Summary)

.../20..

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### Arctic Giant

A tin-ore dressing combine will be built at Deputatskiy, on the 70th parallel of latitude.

This new project on the Arctic Coast will include a large power station, an enrichment plant, an artificial sea holding several million cubic meters of water, and a settlement housing 10 thousand residents.

Wall materials consisting of durable, frost-resistant, thermal-insulating assembly panels will be airlifted into the site. These panels, which have 1/20th the weight of similar ferroconcrete panels, feature thin aluminum alloy facings over polystyrene foam filler.

Prospecting for deposits of clay, sand and gravel has begun.

Trud  
20 May 1966  
Page 4  
(Abridged)

### Siberian Oil

Commercial exploitation of the Mortym'insko-Teterevskiy field has started. This is the fifth field to be opened in the Tyumen' and the second to put oil into the Shaim-Tyumen' pipeline. Still another river of Siberian oil now flows into the country's oil reservoirs.

Sovetskaya Rossiya  
21 May 1966  
Page 2  
(Abridged)

### Mirnyy Diamonds

The leading diamond-industry town of Mirnyy has begotten an entire rayon in Western Yakutiya. Other fast-growing settlements are Chernyshevskiy, site of the Vilyusk Hydroelectric Power Station, Almaznyy and Aykhal.

The Mirnyy diamond industry will be developed still further. Work will soon begin on another dressing plant at Aykhal. Next in line is development of the world's largest diamond deposit at Udachnaya.

Stroitel'naya Gazeta  
25 May 1966  
Page 4  
(Full Text)

.../21..

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## PIPELINES

### Vilyuy Prologue

The pipeline crews in Siberia lead such a nomadic existence their children know no home other than a trailer.

The Taas-Tumus - Yakutsk - Pokrovsk - Bestyakh gas pipeline is being laid under almost unbelievably difficult conditions. The Yakutiya pipeline is an experiment in many respects. New methods and materials are being employed to overcome the terrain and effects of temperature changes.

The Ust'-Vilyuy natural gas field has a reserve of about 30 billion cu. m.

Other explored gas fields are the Sobo-Khainskoe, Badaranskoye, Nedzhelinskoye, and Sredne-Vilyuyskoe. The reserves of these fields are estimated in the trillions of cu. m. and comprise 12% of all gas reserves in the Soviet Union.

Izvestiya  
20 April 1966  
Page 1  
(Summary)

### Through Quagmire, Swamp and Forest

The oil pipeline from Ust'-Balyk to Omsk is being laid through quagmire, swamp and forest. A 438 meter long 1,020 millimeter diameter section under the Irtysh river on the outskirts of Omsk is the second underwater section on this thousand-kilometer long pipeline.

Trud  
21 April 1966  
Page 1 (Extract)

.../22..

- 22 -

### Gas Trunk Lines of the North

Western Siberian gas will become the main industrial fuel of the Urals.

The second stage of the world's northermost pipeline, from Igrim to Serov, is being designed. Its 500 km length will include 6 compressor stations. The planned capacity of the pipeline is 10 billion cu.m. per year.

Plans are nearing completion for the 350 km pipeline from Nizhnaya Tura to Perm'. This line will cross the Urals Range and run along the bottoms of the Kamsk and Votkinsk water reservoirs. Its yearly capacity will be 9 billion cu.m.

The blue fuel will be piped to Nizhnaya Tura, Gornozavodsk, Chusovoy, Lys'va, Perm' and Krasnokamsk. Future plans include supplying gas to Izhevsk, Nytva, Vereshagin, and the new construction community of Chaykovskiy at the site of the Votkinsk Hydroelectric Power Station.

Izvestiya  
21 May 1966  
Page 1  
(Full text)

.../23..

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TRANSPORT AIR

Helicopters to the Islands

Ten helicopters will be used to carry voters to the polls on election day in the Yamalo-Nenetskiy National Okrug.

As a rule, roads are impassable during June in this area and helicopters are the only means of transport.

Izvestiya  
24 June 1966  
Page 1  
(Summary)

.../24...



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## TRANSPORT RAIL

### Seven Thousand New Kilometers

In an interview yesterday, V.T. Shvets, Deputy Minister for Transport Construction, stated that a 700 km railroad will be opened this year on the Mangyshlak peninsula. Work was being completed this week on the northern sector from Makat to Beyneu.

The 900 km line Makat-Aktau-Zhetybay-Uzen' is of great economic importance, since it will open the way to much oil. Its construction will be completed during the Five-Year Plan. The lines from Kungrad to Makat and Gur'ev to Astrakhan' will also be opened, and the nation will get its second route out of Central Asia to Center.

As soon as the sectors Kustanay-Uritskoye and Volodarskoye-Kokchetav are opened, the Central Siberian Trunk line will have been completed. In all, railroads will be extended by 7,000 km. during the Five-Year Plan.

Future plans call for a rail line on Sakhalin from Pobedino to Nysh. Rails will be laid from Termez through Kurgan-Tyube into the Yavan valley, where a chemical industry will be established and the waters of the Vakhsha diverted to permit cotton growing. A rail line is being driven through the Taiga toward the Yenisey river, to the site of the future Sayansk Hydroelectric Power Station.

The railroad network in the Ukraine will be expanded. Lines are being built from Pavlograd to Novomoskovsk with a branch to Dneprodzerzhinsk, and from Gorlovka to Ochertino.

The completed line from Bataysk to Starominsk combined with the Krasnodar-Tuapse line under construction will shorten the route from Center to the Caucasus coast by 300 km.

The following new highways will be opened: Bryansk-Sevsk; Moscow-Tambov; Moscow-Kuybyshev-Ufa, and a number of sections on the future highways from Leningrad to Murmansk, Moscow to Riga, Poltava to Kishinev, etc.

Trud  
22 May 1966  
Page 4  
(Full text)

.../25..

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TRANSPORT ROAD

Winter Road in Spring

Winter roads are still open on the Arctic coast of Chukotka. The 500 kilometer stretch between Zaliv Kresta and the placer at Polyarnyy is being used for delivery of freight.

Trud  
12 May 1966  
Page 1  
(Extract)

.../26..

## TRANSPORT WATER

### Shore Construction in 1966

The directives of the XXIII Congress of the CPSU for the Five-Year Plan of development of the national economy clearly define the main task in the area of capital construction. The statement reads to make the most efficient use of capital investment, guarantee the commissioning of new facilities, living quarters and other objectives in a short time and at the lowest cost, and to raise the quality of construction work".

During the first year of the Five-Year Plan, river transport will implement an important program for construction of ports, shipping structures, ship repair enterprises, and projects for living, cultural-welfare and other types of construction. It is first of all necessary to achieve a reduction in the cost of construction and to improve the quality of the work, to effect a proper distribution of construction projects in river-basins, reduce the construction time, achieve the most rapid assimilation of newly-commissioned production capacity, and to use, as a basis for the solution of these problems, the requirement that there be universal improvement in the efficacy of capital investment.

Before considering the problems in shore construction for river transport in 1966, it is worth reviewing last year's achievements.

In 1965, the river transport economy was augmented by new projects. The following have been put into operation: a mechanized coal wharf equipped with car dumpers at the Ust'-Donetsk port, docks at Leningrad and Yakutsk, construction has been completed on docks at Bratsk and Svirsk, mooring wharves at Aristovo, Toporna, Ivanov Bor, Goritsiye, Lipin Bor and Belozersk on the Volga-Baltic waterway, as well as a number of docks and wharves on the water-reservoir of the Votkinsk hydroelectric power station.

Passenger terminals have been commissioned in the cities of Ul'yanovsk and Volzhsk; the horizontal parts of the slips at the Votkinsk ship repair shops, the Kuybyshev operational repair base and the Gorodetsk ship repair shops have been opened, and the first experimental through-slip has been built at the Khlebnikovo ship repair shops.

The computer center building in Moscow has been completed and is equipped with modern computers.

.../27..

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During 1965, the rivermen got an additional 131 thousand square meters of living space, childrens' pre-school establishments for 1300 pupils and a 520-pupil school at the Zhatay ship repair shops.

A palace of culture has been built at the plant named after the 40th Anniversary of the October Revolution and clubs have been built at the Kuybyshev plant and the Tobol'sk operational repair base.

The plan for capital investment in construction repair operations has been exceeded a little.

As a result of delays on a number of construction projects which are being carried out by both the contract and state method i.e., by the organizational forces and facilities of the ministry for the river-fleet, the construction plan has only been 98% fulfilled.

The Ministry for Construction RSFSR did not commission the dock at the port of Gorkiy and the Ministry for Transportation Construction USSR did not complete the dock at the port of Osetrovo and the shops for training boat crews at the Omsk ship repair shops. In addition, the Ministry for construction RSFSR did not commission a lecture building at the Petrozavodsk river training establishment. The Ministry for Transportation Construction USSR did not complete the plan for construction of the Osetrovo ship yard, the Omsk port, the Bratsk operational repair base, port facilities, bunkers and docks at Abakan, and the railhead at the Medvezh'egorsk port. The former Northeastern Sovnarkhoz did not succeed in achieving normal progress in construction at the Yakutsk port. Work stoppages occurred, in addition to causes attributable only to the contractors; due to the fact that some of the shipping organizations had not ensured that there was adequate control over construction being done under contract the functions of client were not adequately carried out and suitable business relationships were not established with the contractors. The plan for state method construction was not fulfilled either.

The Lena Steamship Line poorly organized construction work at the Krasnoarmeysk and Zhatay plants. The North Western Steamship Line did not commission the shop for manufacture of internal combustion engines at the Nevskiy ship repair shops. The Glavflot is also to blame in this, since it changed its plan for operation of the motor plant in mid-year.

The Irtysh, Yenisey, Kolyma-Indigirka, Volga-Don and Belaya Steamship Lines did not fully utilize the resources assigned to them for construction of living accommodation.

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In spite of the pressing requirement for childrens' pre-school establishments, and although they were planned on far too small a scale in 1965, the resources assigned for this purpose were only 96.0% utilized. This resulted from the incompleteness of plans by the Irtysh, Pechora and Volga-Don Steamship Lines.

Greater attention by Directors to the problems of scheduled application of construction funds made available as a result of capital construction made it possible for some steamship lines to exceed their plans; these lines included the Volga United, the Kama, North Western, along with the factory "Teplokhod".

Construction proceeded unsatisfactorily at the following steamship lines: Lena, Yenisey, North Western and Belomorsk-Onega; they did not complete the tasks in either the application of construction funds or in the volume of capital investment. The Irtysh Steamship Line did not fulfill its plan for capital investment.

These steamship lines had certain difficulties, but their leaders were not capable of finding their own resources and other means of preventing interruptions to plans.

These shortcomings in the planning of construction and in design-experimental work continued into 1965. The plans contained inconsistencies in the volume of capital investment and implementation of basic construction funds; as well as between the period for completion of paper work and for construction of facilities. Capital investments, which had been fixed in the plan for the ministry, had increased by several-fold in the course of a year. Permission was received during the last quarter to begin construction on the Leningrad passenger terminal, the Syktyvkar and Perm' freight ports and the Saratov station. Additional funds were assigned for construction of living accommodation. The increase in capital investment corresponded to the interests of the river transport, but the frequent change in plans naturally was not helpful and to a certain degree it interfered with construction work and slowed the rate of these operations.

The Giprorechtrans<sup>1</sup> did not insure that the necessary paperwork was done for the Yakutsk port and for the construction of communal facilities at the plant named after the III<sup>rd</sup> International At Astrakhan'. The Lengiprorechtrans did not satisfactorily prepare the budgetary paperwork for the port of Leningrad, and they overlooked serious defects in the plan for the Osetrovo port. The author's surveillance has also been weak. By using the directives of the September Plenum of the Central Committee of the CPSU as a guide and taking into account the shortcomings of last year's work, the Ministry for River Fleets, Steamship lines and Enterprises must make a significant improvement in the organization of shore construction, and achieve greater efficiency in capital investments during 1966.

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<sup>1</sup> State Institute for Planning River Transport.

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The workers concerned with this construction must learn the new Rules for financing which were approved by the Soviet of Ministers USSR. These Rules are intended to improve the organization and reduce construction time, to lower the amount of uncompleted construction as well as to improve control in this matter from the point of view of the Stroybank USSR. It should be mentioned that, for the purpose of increasing control over the amount of uncompleted construction, a new form of internal accounting has been introduced in 1966.

Bold application of all that is new and progressive in the organization of construction, initiative, and a creative approach to the work will assist in the successful completion of the plan set for 1966. This plan is very ambitious. The ministry must put into operation 747 running meters of docks, more than 50 thousand square meters of storage area and 10 thousand square meters of shops, 132 thousand square meters of living area, and accommodation for 24 hundred pupils in general schools and childrens' pre-school establishments.

In its concern for the further development of river transport, particularly in the eastern basins of the country, the government has found it possible to increase the amount of investment capital for the Ministry of River Fleets in comparison with last year.

The plan includes preliminary work for the construction of still more ports, individual docks and container areas, hydro-technical, training and other facilities, mainly in the eastern basins.

It is planned to commission docks on the Volga, Lena and Irtysh rivers, continue construction on the Tomsk, Omsk, Syktyvkar, Yakutsk, Kuybyshev, Perm' and Leningrad freight and passenger ports, the Saratov station, the Krasnoarmeysk and Zhatay and Chistopol' plants, the Bratsk operational repair base and other projects.

The success of this plan depends mainly on constant business contact with contractors and on relaxed control over the application of not only capital funds, but also, and this is the main index of the plan, the implementation of construction funds, productive capacity, living area and cultural welfare facilities.

Steamship Lines and other subsidiaries of the Ministry, which are carrying on capital construction, must develop and implement measures for improving the quality and reducing the cost of construction, economizing on materials and increasing the utilization of mechanization and reducing the volume of uncompleted construction. The initiative of the Moscow and Leningrad enterprises in this matter should serve as an excellent example and must be fully utilized by the Steamship Lines and other enterprises in the area of capital construction.

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A great deal of work must be done with construction contractors in determining their responsibilities arising from the agreements and in accordance with internal accounting methods. It is necessary to implement concrete measures for each project in order to ensure that both the commissioning of productive capacity and the plan of construction are fulfilled and to give the contractors all possible assistance.

It must be emphasized that the directors of Steamship Lines and enterprises of the Ministry for River Fleets must consider themselves responsible for the construction plan regardless of whether it is under contract or under the state method of construction.

The Steamship Lines Voga United, Northern, Belomorsk-Onega, East, Siberian, Irtysh, Kama and North Western, the management of the canals named after Moscow and the Volga Baltic Canal named after Lenin should pay particular attention to the scheduled start-time for construction and erection operations on the already-started structures and launching facilities.

The Giprorrechtrans and Lengiprorrechtrans must carry out a fundamental overhaul of the operations of institutes, in the light of the decisions taken by the September Plenum of the CC CPSU, with a view to increasing the responsibility for the economic justification of the location of structures, reducing their budgetary costs, greatly improving the quality of design documentation as a whole and increasing the designer's surveillance over construction. Appropriate conclusions must be drawn from the party's directives by expert organizations in the Ministry for River Fleets and its organizations in relation to the evaluation of projects, while the Directorates and Steamship Lines of the Ministry are to assign planning tasks.

Important changes must be introduced in living accommodation construction practice. At the present time living accommodation is being built mainly in the large cities and in absolutely insufficient amounts and of lower quality at locations where the largest number of river workers are concentrated, i.e., at the operational repair bases, at the shops and in ports.

The directors of steamship lines, basin water controllers and canal authorities have a responsibility for correctly assessing this problem, taking into consideration that a proper direction of resources to the construction of adequate living accommodation in the areas where the fleets winter over, in ports and at the industrial enterprises and in regions of hydrological works will assist in strengthening the cadres, mainly of boat crews, in river transport. The supply of construction materials and equipment to the sites remains the most pressing problem.

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There cannot be toleration of such situations as developed in 1965, when cement and other materials were not delivered on schedule, as well as port cranes and other non-standard equipment. The Kuybyshev plant delayed manufacture of door equipment for factories at the ports of Leningrad and Osetrovo, and the Limenda plant neither produced nor delivered the port crane to the Cherepovetsk port.

It is fully possible to complete the Ministry for River Fleets plan of capital construction for 1966. It is only necessary to give more attention to this most important sector in our economic activity, relying on the help of party and trade organizations of whom, to a great degree, depends the mobilization of the labor force and overcoming difficulties.

The socialistic competition developed in honour of the XXIII Congress of the CPSU will undoubtedly make it easier to fulfill the tasks set before river transport for the first year of the Five-Year Plan in the area of further development of its material-technical base, in particular, for shore capital construction. The author of this article was: B. Yegorov, Chief of the Main Directorate for Capital Construction, Ministry for River Fleets, RSFSR.

River Transport  
#3 1966  
pp 1-2  
(Full Text)

Navigation and Communications  
Qualitative Ice Prognosis; the Guarantee  
of Successful Sailing in the Arctic

The volume of freight in the Eastern Arctic grows yearly. Ten of fifteen years ago freight was carried here by 30 or 40 out-dated ships, convoyed by 3 or 4 icebreakers which, in their own turn, were accompanied by 3 or 4 aircraft. Nowadays, whole convoys of freighters and modern powerful icebreakers sail the Arctic. But sailing through the icefields does limit the delivery of freight in the Eastern Arctic to a definite extent.

.../32..



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In connection with this, timely and qualitative prognosis of ice conditions along the route acquires great importance when transport ships arrive at the Arctic ports and points of call under the escort of icebreakers. Collection of freight at base ports and the time for loading of heavy and medium-tonnage ships largely depends on this prognosis. Many large ships are delayed considerably due to errors in the ice prognosis, and the plan for freight delivery to both the Arctic points and points of call and to other destinations is interrupted. An error in the prognosis of ice break-up (from 2 weeks to a month and a half) results in the pile-up of freighters in the ports and on the eastern fringe of the icefields, awaiting the start of sailing for more than a month. As a result, the icebreakers are not able to safeguard the passage of the majority of these ships along the route during the period when it is possible to sail through the ice. The icebreaker captains strive to provide escort through heavy ice at high speeds, as a result of which transport ships frequently receive damage to their hulls, propellers, and rudders.

The situation is different at many arctic points which have an open roadstead. Ships cannot reach them due to a lack of icebreakers. Alone, these ships move very slowly, since, in heavy ice conditions, it is necessary to change air reconnaissance tactics, which we shall discuss below. This situation cannot be tolerated.

How can the periods of icebreaking be more accurately determined, in order that in the future similar sailing conditions will not be repeated? These conditions bring a considerable loss to the State. What must be added and improved in the complex of measures taken for the purpose of insuring navigation in the Eastern Arctic?

In our opinion, the main thing is to take into account the prognoses of ice conditions provided by the Arctic Institute.

Well organized air reconnaissance plays an important role in the timely and qualitative assessment of ice. In recent years, air reconnaissance has been carried out in the following manner. On request from a ship an aircraft carrying a hydrologist and a master-controller on board flies to the specified region. The results of the ice survey are plotted on tracing paper to a definite scale, which is normally very small. After that the trace is dropped on the ship. But in the majority of cases high winds in the sailing area change the ice conditions in a few hours. In such cases the trace is of no use and, to the contrary, deceives the captain of ships. Many captains use traces that are 2 or 3 days old and independently, without the help of icebreakers (in ice conditions) navigate their ships from port to port and spend from  $1\frac{1}{2}$  to 2 times as much time in the process.

Why is this so?

.../33..

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In our opinion, one of the reasons for this situation is the untimely preparation and delivery of traces to the ships. Another reason and, the main one, is that air reconnaissance does not provide sufficient guarantee for the passage of every ship through the icefields. The master-controllers and hydrologists do not have sufficient interest in their work. There is no suitable place for them in the aircraft from which they could conduct observations of the ice situation and ships passage etc.. The master-controller has the status of a semi-passenger on board the aircraft etc..

It is necessary to arrange matters so that the master-controller, hydrologists and scientific workers are both interested and responsible for the fastest escorting of ships.

A few words about the headquarters for escorting ships. Its composition should include, besides the master-controllers, scientific workers from the Arctic Institute, hydrologists, meteorologists and operations men. Scientific workers should see the ice conditions for themselves together with experienced specialists and be able to realistically evaluate the possibilities for breaking ice. This will make ice prognosis more reliable.

The escort headquarters decides when the ships should be loaded at the base port and when they should put out to sea. In order that these periods be determined more accurately, it is necessary to organize widespread and systematic aerial reconnaissance. We think it should begin in the vicinity of the Chukotka coast at the end of May and aircraft flights should be increased in June. It may also be necessary to use more aircraft and helicopters for this purpose.

Due to the peculiarities of the operations of supply ships which provision the ports and points lying on the Chukotka coast, the escort headquarters must strive to get these ships loaded during normal periods regardless of the results of aerial survey and despatch them under escort of icebreakers along the icefield edge. The presence of heavy ice and partially broken shore-ice at the off-loading points in the majority of cases makes it possible to off-load freight in a very short time. Later on the supply boat, keeping in mind the sequence of breaking of shore-ice, could off-load freight near the shoreline.

There is a whole series of shortages due to which the Arctic vessels are delayed at base ports: freight is not ready for loading through the fault of the shippers, freight is trans-shipped at the port without proper markings and off-loading at Arctic points causes confusion etc.

.../34..

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This was discussed during the production meeting on the diesel ship "Berezinales". A number of proposals were made at this meeting and we will briefly discuss them.

Since Arctic sailing during the conditions of fog, the dark period of the day (in August) and in storms significantly increases the risk of serious damage to the hull, propeller and rudder, is it necessary to investigate the problem of supplying arctic ships, including icebreakers, with infrared equipment (binoculars, projectors etc.). At the same time it is necessary to find a solution to the problem of supplying fresh-water.

Due to the fact that a great number of ships bring a large amount of freight yearly to Point Shmidt and spend a long time there off-loading, it is necessary to build a reinforced concrete pier equipped with 3 rail-mounted cranes at Vostochnaya Bukhta. This will greatly reduce the standing time of ships. It would be expedient to emplace 2 winches that could be used to haul up hulks, self propelled barges and cutters on to the beach at this point.

Considering the heavy work-load on the crews of all ships sailing the Arctic, it is suggested that the crews be augmented by 3 motor mechanics on the pattern used by the collective on board the steamer "Arktika" for the purpose of carrying out large scale repair work and extending the period between repairs.

It is advisable to organize a maintenance crew on icebreakers of the "Moskva" type which would have electro-welders, gas-cutters, ship-fitters, lathe operators and carpenters. If necessary, these icebreakers should be equipped with lathes. Each ship will then be able to make requests to the icebreaker for repair of mechanism and hull. This work could be performed by the icebreaker both during escorting and while at anchor.

It is also important to centralize mail and parcel delivery for sailors in the Arctic, ice reconnaissance aircraft could be used for this purpose.

We think it is time that a recommendation was made to the Ministry to have packages of fresh fruit and vegetables for sailors of the Arctic fleet sent to all Arctic ports and have them consigned to specific ships.

It would be advisable to send at least one permanent staff employee to the ports of Provideniye, Pevek and Tiksi during the Arctic navigation period for the purpose of organizing regular sports tournaments, concerts and interesting lectures on board ship.

It will also be desirable to propose to the Ministry for Maritime Fleets that the food supply to arctic crews be increased.

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We think that the problems concerning improvement of prognosis of ice conditions, organizing ship-convoys, aerial reconnaissance and other problems have a bearing on the Eastern and Western sectors of the Arctic. It is therefore desirable that these problems be widely and seriously discussed with interested persons and organizations (the Arctic Institute, the Ministry for Marine Fleets, Escort Headquarters, captains, hydrologists, meteorologists and polar flyers etc.). It is advisable to publish the results of such discussions in the "Morskoy Flot", and the main headquarters for maritime navigation at the ministry for maritime fleets should develop appropriate recommendations in response to all the proposals and suggestions. The author of this article was: V. Sakharov, Captain of the Diesel ship "Berezinales".

Morskoy Flot #4 1966  
pp 21-22  
(Full text)

#### Kama Depth will Equal the Volga

Work has begun on deepening the Kama river channel. Blasting has started at the Sokolinskiy shoal, which lies several score kilometers below the Votkinsk power station dam.

About 40 shoals on a 350 kilometer sector of the river will be lowered to a depth equalling that of the Volga during this season. A 10% increase in shipping tonnage is expected next year as a result of this work.

Trud  
21 April 1966  
Page 1 (Extract)

#### The Building on Moscow Ostrov

What had once been a tiny radio shack sheltering 4 men has grown into a complex navigational equipment repair shop. Its staff services navigational aids from domestic and foreign ships calling at Archangel. The work of its staff is known throughout the Northern Sea Route.

Vodnyy Transport  
26 April 1966  
Page 4  
(Summary)

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### Along the Northern Sea Route

A large fleet will soon set out on the Northern Sea Route. The convoy of more than one hundred ships includes tankers, freight and passenger diesels, tugs, refrigerator ships, floating cranes, and hydrofoil diesels of the "Raketa" and "Meteor" type.

The first diesels and refrigerator ships have already left Izmail. These ships were built at Czechoslovakian shipyards and will ply the Irtysh, Lena, Yenisey and Amur rivers.

Sovetskaya Rossiya  
27 April 1966  
Page 2  
(Extract)

### Renewed Assault on the Ice

Last January, the icebreaker "Moskva" was unable to clear a channel to icebound ships in the Sakhalinskiy Zaliv.

Now, three months later, the icebreaker "Leningrad", assisted by the auxiliary icebreakers "Erofey Khabarov" and "Khariton Laptev", will undertake the task.

The "Moskva" will leave Magadan to assist its sister ship for a short time before returning to the Arctic.

Sovetskaya Rossiya  
29 April 1966  
Page 4  
(Summary)

### Cracking the Ice Wall

The first convoy reached Archangel from Murmansk after difficult ten-day voyage. The 450-mile trip took only 1½ days last year.

The diesel-electric ship "Indigirka", which made the trip, was loaded in record time with 4,000 tons of cellulose at Archangel and set course for England.

Vodnyy Transport  
30 April 1966  
Page 4  
(Extract)

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### Main Transport Line

The river fleets must fully cope with the volume of timber freight being shipped down the water routes.

Timber shipment in the Ob' basin increased by 45% during the Seven-Year Plan, while its ratio in the total volume of freight shipments increased to 70%. A plan for mutual cooperation to meet the requirements of the Five-Year Plan is being worked out with the Tomles Combine. Special attention is being given to the application of new methods of operation.

The Tomles Combine system includes many collectives that have filled their quotas ahead of schedule. Last year, logging combines and shippers despatched 80% of their tonnage ahead of schedule and were paid a 45 thousand rouble bonus by the steamer line.

Unfortunately, this is not true of all the enterprises. The Tomsk Combine, for example, has been slow in unloading barges. In 1962, barges waited an average of 14 hours for unloading; in 1963, about 29 hours; in 1964, about 40 hours, while last year the average time of waiting was 28 hours.

Inefficient use of port facilities and reluctance on the part of workers are jeopardizing prospects of meeting the planned quotas.

Vodnyy Transport  
30 April 1966  
Page 2  
(Summary)

### Navigation Flag Up

Irtysk was completely free of ice by the end of April and a fleet of 6 tankers set out with benzine and diesel fuel for the field camps.

Vodnyy Transport  
5 May 1966  
Page 1  
(Summary)

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### In the Far North

Spring has come to the Far North and all is in readiness for the navigation season on the Pechora river.

The Pechora fleet operational-repair base has exceeded this year's quarterly output by 17 thousand roubles, reduced costs by 7.9%, and saved 745 kw-hrs of electrical energy.

Shipbuilders have also achieved good results. They have mastered the construction of thousand-ton metal barges, ten-ton floating cranes, and have laid the keel for a diesel freighter of the "P-40" design.

The village of Puteyets in tens of kilometers from Pechora. The dredges in its backwater await the navigation season, when they will move out to the shoals and clear the channel for shipping.

The dredge "Pechorskiy-610" is being outfitted with new automated equipment that will provide direct control of the main engine from the control cabin. This will permit a reduction in crew, an increase in productivity of labour and lighter work for the dredgemen. The crew will have to carry-out capital work on the Srednepeschanskiy Shoals this year.

Hydrographers of the Basin Waterway Administration will cover more than 400 kilometers of the Adz'va, Khoseday and Kos'-Yu rivers. They will spend about 4 months gathering navigation data.

The rivermen will navigate the Laya and Kolva rivers in 1966, using the excellent charts provided by the hydrographers.

Vodnyy Transport  
12 May 1966  
Page 1  
(Summary)

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### Develop a New Route

This matter was reported in the 3 Feb. 66 issue of our paper.

Following an exchange of opinions, it was decided that, during 1966, freight would be delivered to the Indigirka basin by through-trips with transshipment at Osetrovo. Metal lighters of "M" Division of the Lena Steamship Line would be towed by Port Tiksi tugs as far as the Indigirka river bar.

So far, the Ministry for River Fleets has authorized shipment of 7 thousand tons of petroleum products and 5 thousand tons of dry goods by this route.

Vodnyy Transport  
14 May 1966  
Page 2  
(Extract)

### First Voyages

The ice on the Yenisey retreats steadily farther to the north. The diesel tug "Dnepr" has set out to pick up barges which will later move up the tributaries. The "Oleg Koshevoy" and "General Vatutin" set out immediately afterwards. The diesel ship "Zaliv" is carrying flour, sugar and other foodstuffs to the residents of the river settlements of Galanino and Strelka.

The diesel ships "Archangel'sk", "Kerch'", "Novosibirsk", "Astrakhan'" and "GT-5" have received their first assignments. They will pick up saw timber on the wharves of the Kazachinskiy Lespromkhoz.

The Yenisey rivermen have promised to move more than 50 thousand tons of freight over the quota for the first year of the Five-Year Plan.

Vodnyy Transport  
14 May 1966  
Page 1  
(Full Text)

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### Tyumen' Oil Must Move

The river fleets will be required to carry  $1\frac{1}{2}$  million tons of Tyumen' oil this year, in comparison with 840 thousand tons last year. The Minister for River Fleet RSFSR, S.A. Kuchkin, stated this in an interview. He added that a variety of new facilities must be built an existing ones expanded to handle the increased volume of shipments on the deep and shallow water systems of the Tyumen' Oblast'.

Sovetskaya Rossiya  
24 May 1966  
Page 1  
(Extract)

### North of the Kama

A fleet of large and small craft set out from the Perm' region carrying supplies to the upper reaches of the Kama and its tributaries. In all, more than 90 thousand tons of freight, over 20 thousand tons more than last year, will be delivered to the north.

Millions of tons of timber are cut each winter on the headwaters of the Kama and the river fleet must tow out about 700 thousand cubic meters of this timber during the highwater period. One diesel craft towed a log raft of 18 thousand cubic meters of sound Urals timber from Ust'-Kosa to Tyul'kino.

Vodnyy Transport  
24 May 1966  
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(Summary)

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### MISCELLANEOUS

#### Housewarmings

A new department store has opened in the village of Yagodnyy and a wide-screen cinema opened in the fishing village of Tauysk. Both settlements are in the Kolyma.

Izvestiya  
21 April 1966  
Page 1 (Extract)

#### Blasts in Kislaya Gulf

A pit has been dug out at the Prityka promontory with its bottom seven metres below the level of water in the Kola bay. The bay's cold waves are splashing close-by. Pull down the dike, and the water will rush in, filling the pit in a moment.

Just what it is expected to do.

At the middle of the pit there is a strangely shaped structure: a kind of flat roof with irregular steps and jutting out walls... Once in, you find yourself in a concrete tube. At its side is another such tube. Both tubes lie in one huge concrete box. In one of the tubes the assemblymen from Boris Indrishe's team are busily assembling a hydro-turbine. The walls of the box are monolithic concrete.

"Only fifteen centimetres thick, though it has to meet exceptional strength requirements," says the chief engineer Yevgeny Makarov. "A house had to be built, therefore, to cover the dam body and keep the temperature at plus in concreting. It was, I remember, the night after the New Year, when the temperature sunk below forty degrees. That was a very trying experience. Electric heaters were being burnt to capacity to keep up the temperature. We were just afraid they would collapse. And they did, getting out of action one after another. It were the steel erectors Kolya Orlov and Sasha Smirnov and the electrician Nikolai Bayev who saved the day, quickly getting the heaters right..."

.../42..

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The construction of the country's first tidal electric power station is in full swing. It is to be erected at the Kislaya gulf many kilometres away from the Prityka promontory. It is not easy to get there, only by water. The designers have cleverly decided to build the dam near Murmansk in the form of a concrete box and later to tow this floating dock to the Kislaya gulf to be sunk there. A simple, convenient and cheap solution. At any rate much cheaper than carrying the materials, machines and manpower to Kislaya.

The bus is driving along a roadway winding about the hills. We are heading for the Kislaya gulf with a week's supply of food. The road breaks up in Vidyaevo, a small settlement on the shore of a bay with an inspiring name of Hurra-guba. The Vodolaz-8, a small ship serving as home, depot and command post for those engaged in preparing the pit for the tidal power station dam is standing by, ready to take us aboard.

The entrance to the Kislaya gulf is a narrow, sixty-metre wide gap between the rocks. The body of the power station will, in fact, close up this gap. Once the small space between the station and the shores is filled up with earth, the only path left to the water will be through the turbine blades.

"Tidal flow here is four metres a second. It is large enough for the stones to be rolled about. It's good for the station, but for us it's like that," the Vodolaz-8's senior mate Nikolai Yegorov makes a "slashing" gesture at his throat with the edge of his palm. "A dike had to be put up. Now it's easier for the divers to work."

There are three of them. Nikolai Shulichenko is the senior. Thirty years old, he has been a diver for twelve years. He is strong, swift and always calm. With the conviction of a man who is an expert in his trade, he is asserting that no situation is hopeless for a diver.

"Well, what about yourself, have you ever been in such circumstances?"

"Listen, as I say, no such situations exist! For instance, last year. A propeller was being dismantled from an icebreaker. The lifeline caught up around the rope and, on top of that, a steel fall wound about it. Sure, I couldn't get out by myself. The monitor went down. I took in as much air as I could, he cut off the lifeline and up I went."

Nikolai had many a chance to show his skill. One of those days Lenya Larchenko, the second diver, while under water, had a trouble with the valve letting out air from the diving suit. In a very calm, even deliberately monotonous voice, Lenya reported to the control post.

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"Pull in the lifeline!" was an immediate order, and the monitor started pulling the diver from the bottom. In a leap Nikolai was at the manometers: how's air pressure? The jerk of the pointer was followed by the pressure getting to normal. He pressed on the lever and said into the microphones:

"Lenya, come out, it'll do for today..." As if he had to come out solely because "it would do for today". All this took less time than our account of what happened...

Feyodor Pankratov is the third diver. Rather plump, witty and jack of all trades.

The sea bottom is being torn here with explosives. Lenya Larchenko is wading about the bottom, submerged, and gives instructions by phone where the charge is to be placed.

Polar regions have an April of their own: a stormy wind, blinding snow blasts tied the tug, which had to take away the barge, to the port. Someone was getting impatient.

"Let's blast off, Vasilich, eh? The barge will be o-key, won't it? After all, it stands off pretty far."

Nikolai Vasilievich Shestakov, the head of the blasting gang, is smiling.

"Well, what about putting yourself on this barge too?"

The impatient one would shut up. But five minutes later another enthusiast would speak up:

"We have 8,000 cubic metres of ground to take out and time doesn't wait!..."

At least seaman Misha Nechayev came down beaming with smiles.

"Wind's getting to starboard!"

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The warning rockets scare away the wild life. The charges are to go off in succession at intervals of some scores of milliseconds. Those on the Vodolaz having moved off for a good mile are tensely waiting. Nevertheless each time one feels a kind of wonder at the colossal water pillar rising upward, something black is being thrown on the rocks, and a short rumble thuds heavily in one's ears.

Two white rockets. All is in order - all of the charges have been set off and work can be safely resumed...

...Attempts to force the tide into the turbine runner to produce electric power have been made abroad many times. All in vain. To make the tide produce electric power "continuously" is an intricate and expensive undertaking. And the hours when it "voluntarily" operates in full strength mostly fail to coincide with the hours of peak consumption, i.e., about 9 a.m. and 6 p.m.

Soviet power engineers (among them L.B. Bernstein, one of the authors of the Kislogubskaya tidal power station's project) have arrived at the conclusion that tidal electric power stations may not operate efficiently, unless in power systems supplied from hydraulic and thermal power stations. Supplying cheap electric power in prolonged impulses to such power systems, the tidal power stations will contribute to saving up water in water reservoirs at river power stations exactly during the peak hours.

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Sovetskaya Rossiya  
April 29, 1966  
(In full)

### Northern Beauty

A new 5-storey school has been completed at Talnakh. It is believed to be the finest on the 69th parallel and out-classes even Norilsk. The exterior is unassuming, but the interior shows much imagination and good taste. The walls are covered with mosaic compositions and colorful tile. Colored plastic replaces the wooden floors. Facilities have not been overlooked. The school contains offices and classrooms, a gymnasium with showers and a pet's corner.

Stroitel'naya Gazeta  
6 May 1966  
Page 1  
(Summary)

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Energy from the Sea

The first tidal electric-power station is already under construction. Work has begun on the tidal power stations at Mys Prityk near Murmansk, and on Kislaya Guba. Unfortunately, the official attitude adopted recently towards these projects has resulted in work all but coming to a halt. Field tests and planning have been stopped on the Lumbov station.

All this in the face of press reports that France will commission the first stage of its tidal power station at Rans any day now.

Stroitel'naya Gazeta

6 May 1966

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(Summary)

FOR CANADIAN EYES ONLY

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DATE 10 August 1966

# JOINT INTELLIGENCE BUREAU Ottawa

WORKING NOTES NO. 1  
ON THE SITUATION  
IN RHODESIA AND ZAMBIA

JOINT INTELLIGENCE BUREAU  
Department of National Defence  
OTTAWA, CANADA

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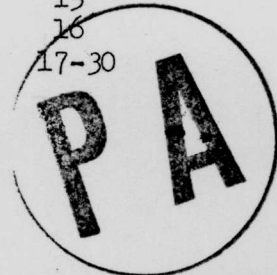
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WORKING NOTES NO. 1  
ON THE SITUATION  
IN RHODESIA AND ZAMBIA

NOTE TO READERS

1. The following material has been assembled as a working aid within JIB in following the developments in the Rhodesian/Zambian crisis. Such collated information may be of value to desk officers in other departments and is disseminated with that object in mind. It is the intention to issue further reports as occasion demands.
2. The overall classification of the document is SECRET, CANADIAN EYES ONLY, but the classification of individual paragraphs is as shown.
3. The material is drawn from a variety of sources available to JIB, including British and American intelligence authorities, British government departments, Canadian Missions abroad and the press and open literature.
4. It is not the intention to comment on all items, although this will be done as occasion permits, but rather an attempt to bring together in one document the latest information on a variety of economic matters related to the Rhodesian/Zambian situation which may be of concern to Canadian government departments. The most important information and judgements on this subject will continue to be disseminated through the JIC.
5. Enquiries or requests for further information on the subject matter should be directed to General Economics II Section, JIB (Ottawa) - Phone 99-2-6884.

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WORKING NOTES  
ON THE SITUATION IN  
RHODESIA AND ZAMBIA

I. RHODESIA

Trade

1. In his recent budget speech the Rhodesian Minister of Finance gives the undermentioned trade figures for the period January-June 1966. British intelligence estimates of these items are given for comparison. It will be noted that they are very similar:

	<u>Published Rhodesian Figures Jan-June 1966</u>	<u>Difference from Jan-June 1965 Claimed by Rhodesia</u>	<u>British Intelligence Estimate</u>
Exports	£46.4 m. (exclud- ing tobacco)	(17% drop)	£40 m.
Imports	<u>£40.1 m.</u>	(32% drop)	<u>£35 m.</u>
Visible Surplus	£ 6.3 m.		£ 5 m.

By excluding tobacco from the export statistics and by giving a figure for the whole 6 months, the Rhodesian Finance Minister has given the best interpretation of the trade figures. Including tobacco, January-June 1965 exports were worth £72 million, thus if little tobacco was sold in 1966, the actual fall in exports would have been substantially higher than 17%. (CONFIDENTIAL)

Rhodesian-US Trade

2. According to a British intelligence report, in April and May 1966 the USA started to import pig iron from Rhodesia at a rate of approaching £2 million a year. In 1965 RISCO's total exports of pig iron were only £2.5 million, the bulk of which went to Japan. (SECRET)

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3. British intelligence authorities report that Rhodesian chrome ore exports to the USA have been continuing normally so far and there appears to be no likelihood of chrome ore production in Rhodesia being reduced. (SECRET)

Various Views on the Effects of Sanctions

Indian Official

4. Thodlani, Head of African Division, Indian MFA, stated on 29 July that the Indian position (previously announced at the UN on 17 May) is that further continuation of the rebellion will make the use of force imperative. In view of further passage of  $2\frac{1}{2}$  months and general belief and evidence that sanctions are not succeeding, Britain, he argued, must now proceed to use force. He admitted that the Indian government would not contribute to a Commonwealth Force and that UN military force was impracticable. (CONFIDENTIAL)  
(CANADIAN EYES ONLY)

Canadian Embassy, Capetown

5. A report from the Canadian Embassy, Capetown, on 5 August made the following observations regarding the effect of sanctions on Rhodesia:

- (a) The Smith regime commands overwhelming support of whites;
- (b) Sanctions have had little effect on the Rhodesian white man in the street;
- (c) The Rhodesian economy is slowly running down but the government has successfully concealed extent of damage from public;
- (d) Damage may not have a serious effect on the economy for another six months or more;
- (e) Government and business leaders are counting on a settlement or a break in sanctions before then;
- (f) At present time any settlement would have to include independence.

(CONFIDENTIAL)

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CANADIAN EYES ONLY

II. ZAMBIA

Zambian Copper Exports

6. The two main copper companies in Zambia have each, since 28 July, been authorized by the government to ship 10,000 tons of copper by rail via Rhodesia, and press reports indicate that the first shipments are now moving.  
(UNCLASSIFIED)
7. According to press reports of 3 August a spokesman of the Roan Selection Trust, one of Zambia's two major copper producers, said that "arrangements have been made for customers to pay for the transshipment of copper via Rhodesia, through European sources outside the UK and that British customers could also pay freight charges through Europe."  
(UNCLASSIFIED)
8. The CRO have indicated that the problem over payment of copper freight charges to Rhodesia has been solved by effecting transactions in Swiss francs through Switzerland.  
(SECRET - CANADIAN EYES ONLY)
9. It is reported that up to 70,000 tons of copper have been stockpiled in Zambia since the flow via Rhodesia stopped on 8 June. This is said to be worth £35 - £40 million, badly needed to meet Zambian import bills. The freight costs of moving copper to Beira is reported to be £10 a ton, thus about £700,000 in hard currency, other than sterling, will be needed to move the backlog. Despite strenuous efforts to utilize alternative routes, only about 30% (20,000 tons) of Zambia's production did so in July. Thus to move the remainder, and so keep the mines working at full capacity, will cost about £400,000 a month (i.e., for 40,000 tons a month).  
(UNCLASSIFIED)

Zambia Announces 4-Year Development Project

10. In a speech on 31 July 1966, President Kaunda announced a \$1.12 billion 4-year development programme to reduce Zambia's dependence on Rhodesia. Half of the massive development plan, he said, will be financed by the government, the rest by private enterprise, mainly the two Zambian copper-mining companies, Roan Selection Trust and the Anglo-American Corporation.  
(UNCLASSIFIED)
11. Major projects to be undertaken include:
- (a) A railway link, of over 1000 miles, between Zambia and the East African coast in Tanzania. The cost is estimated at \$280 million and it is expected to take 5 years to complete;

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- (b) A new hydroelectric project at Kaufe, 30 miles south of Lusaka;
- (c) A new oil pipeline from Dar es Salaam to Zambia to be completed by 1968.

(UNCLASSIFIED)

Comment

12. The above-mentioned projects are all long-term ones and therefore not immediately relevant to the present crisis. However, they do illustrate Zambia's firm intention to re-orientate her economy and transportation routes away from dependence on Rhodesia. (UNCLASSIFIED)

13. The "Tanzam" railway has now been discussed for several years and a recently completed survey apparently indicated it is an economic proposition. However, at the same time the new oil pipeline will presumably take care of POL imports and the Zambian government is anxious to develop other transportation routes, e.g., via Salima to Beira, and to Mtwara. (UNCLASSIFIED)

14. The Kaufe dam is intended to provide an alternative source of power for Zambia's copper belt which at present relies essentially on power from the jointly owned (with Rhodesia) Kariba dam, where the power station is on the Rhodesian side of the river. (UNCLASSIFIED)

15. The new pipeline is apparently for oil products (although it is possible it might eventually be used for crude). The Italian company, ENI, has recently opened a 250,000 ton annual capacity refinery at Dar es Salaam and some of its spare capacity will be made available for Zambia. Originally Zambia had considered a crude oil pipeline to service a new refinery which it was hoped to build in Zambia. (UNCLASSIFIED)

Aid to Zambia

16. CRO informed the Canadian High Commission, London, on 4 August that Kaunda had informed their officials that he had refused the latest British offer of £7 million of aid, not because it was too small, but as a matter of principle. He did not believe that sanctions would work, consequently it would be "immoral" of Zambia to accept emergency aid which was not specifically and effectively directed towards the objective of overthrowing the Smith regime. The Counsellor in the Zambian High Commission, London reiterated the same view to the Canadian /High Commission

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CANADIAN EYES ONLY

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SECRET  
CANADIAN EYES ONLY

High Commission but added that Zambia would still be prepared to accept long term development aid from Commonwealth sources.

(SECRET - CANADIAN EYES ONLY)

17. CRO indicate that the British have decided to make another offer to Zambia in the near future:

- (a) they will repeat their original offer of £6.85 million to be spent as required by Zambia up to 31 December 1966;
- (b) in addition, they will give a firm promise of another £7 million to be allocated at a meeting early in December 1966. This will be available, if needed, before 31 December;
- (c) funds for 1966 may be carried over if they have not been spent by 31 December.

(SECRET - CANADIAN EYES ONLY)

18. In return Zambia will be asked to:

- (a) do its utmost to reduce imports from Rhodesia, especially those which will increase unemployment in Rhodesia;
- (b) not to obstruct the export of copper (the problem over payment of copper freight charges has been circumvented by effecting transactions in Swiss francs through Switzerland);
- (c) These offers will be reconsidered if Zambia leaves the Commonwealth or breaks diplomatic relations with Britain;
- (d) The British offer is valid during the continuance of the emergency. The "end of the emergency" is defined as "restoration of constitutional rule and/or normal communications." (This phrase is intended to cover situations in which there may be civil unrest or war.)

(SECRET - CANADIAN EYES ONLY)

19. According to CRO officials the reasons for the British doubling their offer\* are:

- (a) it will help the British at the Commonwealth PMs meeting to be able to say that they did not give up trying to meet the Zambian position;
- (b) a continuing British-Zambian quarrel would be bound to encourage the illegal regime in Rhodesia;
- (c) the denial of the Zambian market to Rhodesia would be discouraging for Rhodesia;
- (d) the British seek a settlement in Rhodesia that black Africa will accept, or at least not obstruct.

(SECRET - CANADIAN EYES ONLY)

\* Background notes on recent developments regarding Zambian requests for aid are at Annex.

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CANADIAN EYES ONLY

ANNEX "A"

BACKGROUND NOTES ON RECENT DEVELOPMENTS

REGARDING ZAMBIAN REQUESTS FOR AID

Zambian Aid Requirements

1. At a meeting of the Commonwealth Sanctions Committee on 13 July a plea was made by Zambia to all Commonwealth members for emergency aid as part of her struggle against Rhodesia. Britain had already offered about £7 million worth of aid to develop alternative transportation routes so that Zambia would not have to rely on Rhodesia, but Zambia considered this inadequate. (UNCLASSIFIED)
2. British Minister Hart indicated that she would like to see every Commonwealth country accept some specific responsibility in the crisis, e.g., participation in a Commonwealth airlift. The Sanctions Committee is still discussing Zambia's requirements and Zambia has tabled a report of her needs (now available in Ottawa). The Canadian government has indicated that the response to Zambia's needs should be co-operative and that there should be a co-ordinated approach to specific problems. (CONFIDENTIAL -

CANADIAN EYES ONLY)

British Aid

3. The British representative informed the Sanctions Sub-Committee on Zambian requirements on 22 July that Britain had already spent £10 million (double the amount spent by Zambia itself) in emergency aid to Zambia, plus money and effort expended on ancillary technical assistance, personnel, commissioning of expert studies, etc. (CONFIDENTIAL- CANADIAN EYES ONLY)
4. In June the British offered Zambia further emergency aid, so far not accepted by Zambia, of £6.85 million including

- |                |                                       |
|----------------|---------------------------------------|
| (a) £250,000   | - for Dar es Salaam harbour           |
| (b) £1,000,000 | - for Mtwara harbour                  |
| (c) £600,000   | - for maintenance of Great North Road |

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CANADIAN EYES ONLY

- \* (d) £1,000,000 loan - for tarring of Great North Road
- (e) £250,000 - for Mtwara airport
- (f) £500,000 - for vehicles on order
- \* g) £3,000,000 - for continuance of two airlifts after October
- (h) £150,000 - for crash development of Kandabwe coal

The British official assured the Zambians that British aid would continue until the Rhodesian crisis is ended. (CONFIDENTIAL - CANADIAN EYES ONLY)

An earlier GRO report gave the following cost figures, provided by consultants, of the various projects and they differ in some respect to those given above:

- (a) £400,000 for shore equipment, floating craft (lighters at Dar es Salaam)
- (b) £300,000 for depot for Zambian cargo at Dar es Salaam
- (c) £380,000 for improvements to Mtwara Airfield
- (d) £600,000 for lighter jetty at Mtwara
- (e) £325,000 for trucks for carriage of Kandabwe coal to railhead
- (f) £300,000 per month for extra cost of road transport from Mtwara
- (g) item for "additional help" which includes provision for contingency and meeting extra cost claimed by Zambia for development of project such as Kandabwe coal. (CONFIDENTIAL - CANADIAN EYES ONLY)

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- .....
- \* The Zambian Foreign Minister noted that Britain had offered not £7 million, but £2.6 million plus a £1 million loan, and another airlift if the need arose. (This seems correct, see above)

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CANADIAN EYES ONLY

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SECRET

CANADIAN EYES ONLY

Possible Canadian Aid to Zambia

6. On the 16 July, a CRO official commented to the Canadian High Commission, London on projects which might most usefully be considered by Canada:

- (a) Resumption of an RCAF airlift of POL from the Congo, on the ground that it would be a neat, self contained operation and be especially acceptable to the Zambians.

(N.B. The British understand that the Great North Road route is at present only handling about 13,000 tons per month of the total requirements of 17,000 tons a month).

- (b) The improvement of Mtwara airfield

- (c) The extra cost of road transport from Mtwara. This would be in the form of extra vehicles, as the Zambians are expected to buy from the Fiat Company, help would be in the form of a cash contribution. (CONFIDENTIAL-CANADIAN EYES ONLY)

7. The Canadian High Commission, London has suggested that of these, aid in the improvement of Mtwara airfield is a type of project suited to Canadian aid and would have immediate and long term value. (Several surveys have already been made including a recent one by British experts). On the other hand the Canadian High Commission, London observed that resumption of an airlift would be difficult to justify before Zambia actually makes a complete trade cut-off with Rhodesia. Furthermore, it is purely an emergency type of help which makes no permanent contribution to the Zambian economy. The Canadian High Commission, London has pointed out that while the Zambian rescue operation is a complex and highly political operation, fundamentally it is a political confrontation between Britain and Zambia, it cannot be treated as a straight forward aid problem, even of an emergency type. (CONFIDENTIAL - CANADIAN EYES ONLY)

8. On 19 July the Canadian Ambassador, Kinshasa, reported that on his visit to Lusaka in mid July, no requests for emergency aid were made to him by the Zambians although an official (presumably British) of the Zambian Contingency Planning Organization talked in general terms of the likely need for an airlift between Zambia and Mtwara and wondered if Canada would help.

(CONFIDENTIAL-CANADIAN EYES ONLY)

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CANADIAN EYES ONLY



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CANADIAN EYES ONLY

9. On 28 July the Canadian Ambassador, Kinshasa, received a note from the Zambian Minister of Foreign Affairs requesting Canadian assistance as a matter of utmost urgency to establish railway workshops at Broken Hill thus reducing dependence on the Rhodesian railway workshops at Bulawayo.\* The Canadian government was asked to:

- (a) nominate consultants and ask them to quote fees for the project;
- (b) indicate names of contributors who would undertake construction and others who could supply equipment and machinery;
- (c) be prepared to assist financing either by meeting consultants fees and/or financing any part of the project on a loan or joint basis. (RESTRICTED)

10. The Canadian government has already spent \$1.4 million on the oil airlift to Zambia from January - April, 1966 when Canadian aircraft carried some 5,000 tons of POL. (CONFIDENTIAL-CANADIAN EYES ONLY)

11. According to the Department of External Affairs on 21 July, the Canadian Cabinet approved some time ago a special UDI Contingency allocation, available in 1966, of \$500,000 out of general funds to meet modest Zambian requirements, of which \$150,000 has already been committed to finance the provision of air traffic center personnel. (CONFIDENTIAL-CANADIAN EYES ONLY)

12. The Canadian government to date has indicated to Zambia its concern over the situation and that her response will be one of co-operation, but has suggested there should be a co-ordinated (Commonwealth) approach to specific problems. (CONFIDENTIAL-CANADIAN EYES ONLY)

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- \* The British received an identical note on 26 July, they do not regard this as an emergency project, but consider it would have long term benefits. The British are not at present disposed to give Zambia aid for this project, but will give guidance in finding consultants and contractors.

(N.B. If Zambia breaks with the joint Rhodesian Railway System, this requirement could become urgent) (CONFIDENTIAL-CANADIAN EYES ONLY)

SECRET

CANADIAN EYES ONLY

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August, 1966

DATE \_\_\_\_\_

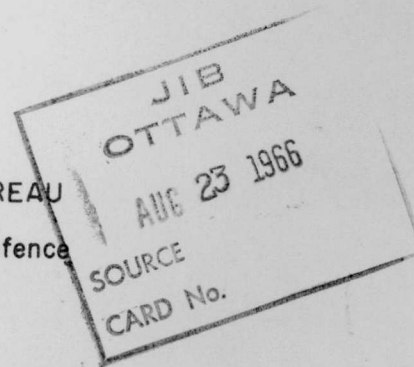
# JOINT INTELLIGENCE BUREAU Ottawa

The Economic Situation in North and South Vietnam and the Adjacent States

July, 1966

JIB/CAN 20/66

JOINT INTELLIGENCE BUREAU  
Department of National Defence  
OTTAWA, CANADA



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The Economic Situation in North and South Vietnam and the Adjacent States

July, 1966

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JTB(CAN) 20/66

The Economic Situation in North and South Vietnam and the Adjacent States

July 1966

Object:

1. To review the economic situation in North and South Vietnam, Laos, Thailand and Cambodia as of July 1966 including the involvement of the USSR and Communist China in the area.

Economic Situation

South Vietnam

2. The economy of South Vietnam is mainly agricultural; rice and rubber are the principal products under normal conditions. At present, the economy is not viable in itself and is supported by the United States at a level which exceeds one million dollars per day, not counting direct military assistance. In 1963 a net exporter of rice, South Vietnam must now import large quantities to feed the urban populations. The country has only a relatively small industrial sector and since 1964 the war has greatly discouraged further development. Inflation remains a serious problem.
3. Three years ago South Vietnam exported about 300,000 tons of rice and it now appears that in 1966 some 400,000 tons will have to be imported. This situation is partially a result of rice shipments from the Mekong Delta being intercepted by the Viet Cong, but it appears that this is only part of the problem. Vietnamese officials in some delta provinces estimate that as much as 20 per cent of the rice land has been abandoned as a result of the military situation. This, compounded by labour shortages and hoarding by farmers and merchants, further complicates the matter.
4. South Vietnam's only remaining export which normally accounts for one-half of its foreign exchange earnings is rubber. Production in 1964 was 73,253 tons, up 4.8 per cent over 1963. Production in 1965, however, was expected to decline as a result of the damage and destruction of many rubber estates. Furthermore, unless replanting can be carried out, output will continue to decline. This loss of vitally needed foreign exchange will almost complete South Vietnam's absolute dependence on American aid.
5. Inflation is apparently one of South Vietnam's most immediate and pressing problems. Although an attempt was made in mid-June 1966 to check it by a programme involving the devaluation of the piastre, the stabilization of the price of gold, tax incentives designed to encourage investment and plans for the importation of increased quantities of

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consumer goods, the situation is unlikely to change appreciably as long as general insecurity and scarcity prevails. The Viet Cong, in addition to causing high prices by reducing supplies, levy burdensome taxes on the distribution of rural produce from the areas they control and these taxes are passed on to the consumer. Furthermore, the **insecurity** caused by the Viet Cong is unfavourable to productive investment, and highly favourable to speculation and hoarding.

6. As for the future the economy will undoubtedly continue to be under considerable strain to support the war which in turn will prevent much if any basic growth. South Vietnam can be expected to remain heavily dependent on foreign assistance. However, it is doubtful whether much of this aid will be from private foreign capital in view of the continued atmosphere of **insecurity** and political instability.

#### North Vietnam

7. The economy of North Vietnam is based primarily on agriculture which furnishes the bulk of the food consumed, supplies most of the raw materials for light industry, and provides the major exports of the country. Normally, about 80 per cent of the population is engaged in agriculture which produces over 60 per cent of the national income. The industrial sector, while small in comparison to agriculture, continues to hold its own.

8. The maintenance of food supplies is presently one of North Vietnam's most pressing problems. The rice harvest in 1965 is estimated to have been slightly better than the 4.5 million tons produced in 1964, but on a per capita basis rice production has been on the decline since 1959. Air strikes have aggravated the tight food situation by: (a) disrupting normal distribution channels, and (b) forcing the leaders to divert farm manpower to repair bomb damage at times when it is critically needed in the fields. A spokesman for the Ministry of Agriculture admitted early in 1966, that a significant amount of acreage devoted to spring rice had not been planted this year due mainly to manpower shortages and that agricultural workers would have to increase their workdays 25-50 per cent to make up for the loss. The land not planted could normally yield about 8 per cent of the total rice produced. Although such a decline in rice production increases the food-supply problem, any resulting shortage could presumably be overcome by substituting other foods or by increasing imports.

9. Industry in North Vietnam is dependent on aid from the Communist nations - principally the USSR and China. Hanoi relies heavily on these

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sources for machinery and for the greater part of its industrial raw materials. It also depends on aid to help finance these goods. The most important heavy industry is the mining of anthracite coal. Not only is coal the major source of energy, but under normal conditions it also is the most important export commodity. All of North Vietnam's POL requirements are imported as no oil deposits have as yet been discovered. Except for an iron and steel works capable of producing about 100,000 tons of pig iron annually and a shipyard capable of building vessels of up to 1,500 tons, most of North Vietnam's industry is small and in most cases primitive. Industrial production in 1965 increased 8.4 per cent, according to official North Vietnamese estimates.

10. The Second Five-Year Plan (1966-70) due to begin in January has been officially shelved and replaced by a Two-Year Plan (1966-67). The objectives of this latter plan indicate a priority for agriculture and an increased emphasis on the production of fertilizers. Capital investment in 1966 will reportedly increase by a third over 1965 and priority will be given to transport (which is subject to U.S. air strikes) and the development of numerous small-scale industrial units all over the country. The idea behind this major switch from the earlier plan to build large modern plants in the key industrial areas, is apparently to (a) help each province become a reasonably independent economic unit able to satisfy local needs for consumer goods; and (b) to reduce losses resulting from air strikes. It also demonstrates North Vietnam's apparent inability to proceed with an expensive programme of heavy industrial construction, even with the help of the USSR and Communist China.

11. North Vietnam suffers from a relatively underdeveloped, neglected, subsistence economy the growth of which has been further impeded by the severe burden resulting from the war. However, it is quite probable that the economy could withstand a prolonged conflict without any real danger of collapse, providing there is (a) no substantial escalation of the war, and (b) a continuation of massive foreign aid.

#### Laos

12. The Laotian economy is the least developed of all the countries in S.E. Asia. There is virtually no industry and although some 90 per cent of the population is engaged in agriculture, the country is still a net importer of rice. Most of the trade is barter trade and the small monetized sector of the economy is supported essentially by aid from the West. The economy is incapable of offering anything but minimal aid to the Viet Cong. However, Laotian territory will undoubtedly continue to be used as a supply route.

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### Thailand

13. Thailand, thanks to aid and loans from the U.S. and World Bank, has a relatively healthy economy for S.E. Asia, and has become one of the world's leading rice exporters. Now that South Vietnam has become a net importer of rice, Thailand provides a near-by supply. In 1965 Thailand sent 27,000 tons of rice to South Vietnam and expects to ship a further 75,000 tons in 1966.

### Cambodia

14. Cambodia has primarily an agrarian economy with rice the principal crop and foodstuff. Together with rubber, rice accounts for about two-thirds of Cambodia's total exports. Significant quantities of Cambodian rice are reportedly reaching the Viet Cong in South Vietnam and the DRV logistic organization along the rice-deficient routes of Southern Laos. Although the quantities involved are difficult to assess, an indication is offered by the fact that only 50,000 tons of rice were made available to the Cambodian State Trade Agency (Sonexim) early in 1966 instead of an estimated 300,000 to 400,000 tons. Government prices for rice are not high enough to be attractive and thus smuggling provides a profitable alternative to normal outlets.

### Involvement of the USSR and Communist China

#### North Vietnam

15. Both the Soviet Union and Communist China are heavily involved in North Vietnamese industry and transportation as well as in military aid to this country. Between them they account for more than 85 per cent of economic aid offered to North Vietnam, China to the extent of about \$500 million up to the end of 1965 and the USSR somewhat less than \$400 million in a similar period. While assistance from the former country has been heavily orientated towards basic materials and manpower, that from the latter has involved machinery and equipment, motor vehicles and technical assistance to industry. Similarly, most of the North Vietnam's trade is with the communist countries, in this case with the USSR predominating slightly over China. In the field of military aid, the USSR has provided equipment including AA guns, jet fighters and light bombers and surface-to-air missile systems. China's contribution to military aid includes the bulk of small arms and ammunition used by North Vietnam and jet fighters, transport aircraft and motor gunboats and torpedo boats. It is clear

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that without the continued assistance of both the USSR and Communist China, the North Vietnamese would be in desperate straits. This situation will continue; the level of aid will depend on the course of the war.

Laos, Thailand and Cambodia

16. Total USSR trade with these countries amounts to only some \$4 million annually and is mainly with Thailand and Cambodia. In the case of the latter, a substantial part is based on economic assistance. Cambodian imports are about half in the form of machinery and equipment and a major constituent of her exports is rice. Chinese trade with Cambodia in 1964, the latest year for which statistics are available, amounted to a turnover of about \$16 million. Thailand has little or no trade with China. Laotian trade with either the USSR or China is non-existent. There is unlikely to be any marked change in the existing trading patterns of these countries in the near future.

17. Economic and military aid from the communist countries is confined to Laos and Cambodia. In the case of the former, economic aid amounted to about \$8 million from the USSR and \$4 million from China up to the end of 1965 but little of this has been taken up. Cambodia had, up to the end of 1965, been the recipient of about \$30 million in aid from the USSR and some \$50 million from China, all of the latter and about one third of the former in the shape of grants. In the case of the Soviet Union, this aid has been used for the construction and equipment of a hospital, the provision of a technical college and the erection of a dam and power station. Chinese aid has largely been expended on building plants for the production of paper, textiles, plywood and cement. The Cambodians undoubtedly could make use of additional economic support but there are no signs of any current negotiations, though the Cambodian Deputy Prime Minister did visit Moscow in March of 1966. It seems probable that in the next few years, the present quantity of economic aid from the two major communist powers will be augmented and that there is likely to be a competitive element in such extensions, since Cambodia is less committed than other southeast Asian countries.

18. The precise amount of military aid agreements between Cambodia and the communist countries is unknown. However, up to the end of 1965, Cambodia is believed to have received about \$4 million worth of aid from the USSR, though deliveries were suspended throughout 1965. Then in March of 1966, the USSR made an outright grant of \$2.4 million for arms aid, including fighter and transport aircraft and an AA battery. Chinese military aid, which at January, 1966, amounted to somewhat more than \$8 million,

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has continued and includes a small number of jet fighters as well as vehicles, some artillery and small arms. Again, the element of competition between China and the USSR is likely to be significant in Cambodia and it is probable that the latest resumption of aid from the Soviet Union is a direct result of this. As far as is known, there have been no recent military aid agreements between Laos and either the USSR or China, although arms have reached the dissident forces within that country from North Vietnam.

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31 August 1966

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# JOINT INTELLIGENCE BUREAU

## Ottawa

Communist Economic and Military Aid  
Activities in the Underdeveloped Areas

June 1966

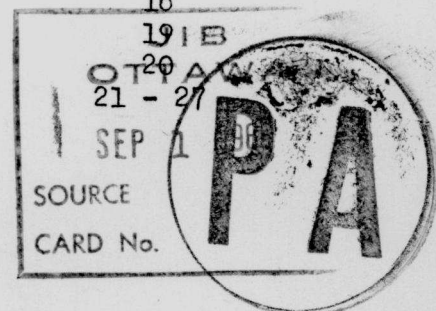
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OTTAWA, CANADA

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Communist Economic and Military Aid  
Activities in the Underdeveloped Areas

July 1966

PART I - ECONOMIC AID

LATIN AMERICA

Brazil

1. According to a report from Brazil the Soviet Union has extended a \$100 million commercial credit to Brazil to be used largely for the purchase of Soviet oil equipment for Brazil's expanding petroleum industry. The credit provides for payment in an eight year period with interest at 4 per cent. This is the first Soviet loan to Brazil and is similar in terms to the \$180 million in commercial - type loans extended to Brazil by Czechoslovakia, Roumania and Poland in 1961 of which an estimated \$28 million has been drawn. (CONFIDENTIAL)

Uruguay

2. According to a press report the Uruguayan authorities are studying a Soviet proposal for a USSR-Uruguayan commercial loan agreement. The Soviet Union reportedly has offered Uruguay a \$20 million loan to promote commercial exchanges between the two countries. If Uruguay agrees to the proposal, the agreement will be similar to the one recently concluded between Brazil and the Soviet Union. (UNCLASSIFIED)

3. Discussions concerning the formation of a Uruguayan - Soviet mixed trade commission have also been underway and some progress is believed to have been made. According to one report the Soviet Union appears to be agreeable to most Uruguayan proposals and is willing to pay a substantial price in order to maintain its presence in Uruguay. (SECRET)

Mexico

4. According to government statistics Mexico's trade with the communist countries in 1965 increased tenfold in the past four years.

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However, the total is only about 3 per cent of Mexico's world trade or \$80 million out of total trade valued at \$1.5 billion. The increased volume of trade with the communist countries is largely attributed to increased exports of Mexican corn and wheat to Poland and sales of Czechoslovak industrial machinery on the Mexican market.

(UNCLASSIFIED)

Peru

5. A Peruvian government minister stated recently that his country may start large-scale trading in agricultural products with Communist China and the Soviet Union, beginning with the sale of cotton. Peru has no agreements of any kind with the communist countries and its annual trade with them, mainly with the East European communist countries, is less than one per cent of Peru's total trade. Trade with the Soviet Union and Communist China is almost non-existent.

MIDDLE EAST

Turkey

6. Soviet Premier Kosygin is reported to have accepted an invitation to visit Turkey later this summer. It is certain that during his visit the main subject discussed will be the utilization of a Soviet credit for \$200 million extended in late 1965. A total of eight projects are reported to have been considered under the Soviet loan including a power station, a aluminum plant, a sulphuric acid plant, fibre-board plant and a glass factory, and possibly a steel plant. A Turkish delegation recently visited Moscow to discuss these projects and on their return to Turkey announced that agreement in principle had been reached.

(RESTRICTED)

7. The Soviet Union has been pressing the Turkish government for a decision on the utilization of the Soviet loan and reportedly has given Turkey until mid-August 1966 to decide whether or not to go ahead with the projects.

(UNCLASSIFIED)

UAR

8. A joint UAR/Soviet committee has approved plans to construct a new harbour at Damietta. The cost of the new port is estimated at \$14 million.

(UNCLASSIFIED)

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Iran

9. Iran and Czechoslovakia have concluded a trade agreement under which the two countries will exchange \$107 million worth of goods over the next three years. In a second agreement Czechoslovakia has extended Iran a \$15 million commercial credit repayable over 10 years with interest at 2.5 per cent. Iran will export cotton, dried fruit and minerals in exchange for machinery for an iron casting foundry, a machine tool plant and other heavy machinery. A \$20 million Czech development credit was extended to Iran in 1963. (UNCLASSIFIED)

AFRICA

Chad

10. Chad and the Soviet Union have concluded a cultural and scientific agreement. This is the first agreement of any kind signed between Chad and the communist countries. (RESTRICTED)

Zambia

11. Another report has been received that President Kaunda recently discussed the Tan-Zam rail link with a Chinese government delegation (see JIB(CAN) 17/66). This report, like the previous one, is attributed to a Chinese informant. There is no evidence that Kaunda is now prepared to have large numbers of Chinese working in Zambia. (SECRET)

Ghana

12. The Ghanaian government has halted all work on the Bui Dam project on the Black Volta River. Seven other projects, including a housing development, dredging the Tema harbour and road construction have also been abandoned. Actual construction work on the Bui Dam project would have involved the Soviet Union in a new credit extension to Ghana valued at about \$100 million. (UNCLASSIFIED)

Guinea

13. Four Soviet fishing vessels, the first of ten to be supplied to Guinea have arrived at Conakry in accordance with the terms of an agreement concluded with the Soviet Union in February 1966. (UNCLASSIFIED)

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14. According to a UK report some of the Soviet personnel currently employed on the UAR's Aswan Dam may soon be transferred to Guinea to help with the feasibility studies for Guinea's Konkoure Dam project. The Soviet Union has not yet committed itself to construct the dam, but if it does undertake to finance the project a substantial new credit is likely to be extended to Guinea. At the present time about \$25 million out of a total of \$75 million in Soviet aid has not been drawn. The cancellation of the Bui Dam in Ghana may induce the Soviet Union to make a decision. (SECRET)

Mali

15. Yugoslavia has extended a \$1.5 million credit to Mali of which Mali can use half during 1966 and the remainder in 1967. Repayment of Malian debts to Yugoslavia have also been postponed for two years and an earlier unused credit was extended to 1968. (UNCLASSIFIED)

16. Under an economic agreement concluded in June, 1966 Mali received new economic aid from Communist China. The value of the aid extended has not been disclosed but it is speculated that it may involve Chinese hard currency payments to Mali. Communist China is reported to have extended Mali about \$8 million in hard currency in 1965 most of which is believed to have been drawn. Previous Chinese aid to Mali is estimated at about \$38 million, including a \$10 million commodity credit. About 60 per cent of the aid extended has been utilized. A Malian delegation visited the Soviet Union in June and reportedly was seeking additional Soviet aid. Previous Soviet aid to Mali was extended in 1961 and 1962. (SECRET)

Mauretania

17. The Soviet Union and Mauretania have initialled a trade and payments agreement which will be signed at a later date in Moscow. This is Mauretania's first agreement with a communist country. (UNCLASSIFIED)

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Algeria

18. Early in August, 1966 Algeria and the Soviet Union reached agreement on the utilization of Soviet development credits. The most important project discussed was the Annabah (BONE) steel plant for which the Soviet Union provided a loan of \$128 million in 1964. Under the steel plant agreement the eventual capacity was expanded from 400,000 metric tons to about 1 million tons of rolled products annually and completion of the plant was set for 1969 instead of 1971. The Soviet Union has also agreed to build a training centre for Algerian steel workers.

19. Other Soviet aid projects agreed upon were a lead and zinc concentration plant, a power station, and the provision of Soviet personnel and equipment for petroleum exploration. These projects are likely being financed under a 1963 Soviet line of credit valued at \$100 million of which only a small amount has been drawn.

(CONFIDENTIAL)

Ethiopia

20. According to a UK report the Assab oil refinery is nearly completed and is expected to be operating at full capacity at the end of 1966. This project was constructed under a Soviet credit extended to Ethiopia in 1959 and is the only project of note completed under the credit. (UNCLASSIFIED)

ASIA

Nepal

21. During a recent visit to Peking by the Crown Prince of Nepal, Communist China reportedly offered Nepal new economic aid valued at \$20 million. The purpose of the credit was not disclosed but in 1965 the possibility of Chinese aid for a hydroelectric development was discussed between the two countries.

22. Previous Chinese economic aid to Nepal is estimated at about \$34 million, with all of it extended in the period 1956-1960. Up to the present time less than one third of the aid extended has been drawn.

(CONFIDENTIAL)

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India

24. During official discussions in Belgrade in June, Yugoslavia and India reached agreement on the assistance that Yugoslavia is extending for India's Fourth Five-Year Plan. Yugoslavia has agreed to provide a long-term credit for \$80 million(US) to be used for the purchase of Yugoslav machinery and equipment. In July Yugoslavia and India started negotiations on the effects of the devaluation of the rupee on their bilateral payments relations. Payments under the bilateral agreement are made in non-transferable rupees.  
(UNCLASSIFIED)

25. The Soviet news agency Tass announced recently that the Soviet Union has extended a \$630 million development credit to India for its Fourth Five Year Plan. In addition it is estimated about \$400 million is available from previous Soviet credits for the current development plan. We have no information concerning the utilization of the new loan but believe that a major portion will be obligated for construction projects and, according to US and UK reports, \$220 million will be for medium-term commercial credits. The new credit is the largest extended to a less developed country by the Soviet Union and raises the value communist economic aid to India to \$1,980 million of which the Soviet Union has extended \$1,650 million.  
(SECRET)

Pakistan

26. Communist China has announced that it will ship 100,000 tons of rice as emergency relief for East Pakistan. China, which exported more than 800,000 tons of rice in 1964, cut planned exports of 250,000 tons of rice to Cuba by about one-half earlier in 1966, pleading inability to meet Cuban requirements. Despite a domestic grain shortage Communist China also plans to provide 100,000 tons of grain as emergency relief to the UAR.  
(CONFIDENTIAL)

Burma

27. General Ne Win visited Czechoslovakia and Roumania recently and the communique issued following his visits implied that some form of economic aid from both countries is likely to be forthcoming.  
(UNCLASSIFIED)

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TABLE I  
Communist Economic Aid Extensions  
1 January - 31 July 1966

		(Million US\$)
<u>Extended By</u>	<u>Recipient</u>	<u>Value</u>
Soviet Union	Iran	290.0
	Pakistan	20.0
	Turkey	33.0 *
	Syria	148.0
	Cameroun	7.7
	UAR	165.0 **
	Burma	14.0
	Somalia	4.2
	India	<u>630.0</u> <u>1,311.9</u>
Czechoslovakia	Pakistan	<u>28.0 ***</u>
Hungary	India	<u>52.5</u>
Bulgaria	Syria	<u>15.0</u>
Communist China	Tanzania	8.5
	Cambodia	<u>42.9</u> <u>51.4</u>
	<u>TOTAL</u>	<u>1,458.8</u>

\* The value of the loan to Turkey in 1965 has been revised upward to \$200 million, an increase of \$33 million

\*\* Offer only, not confirmed

\*\*\* Credit originally reported to be valued at \$70 million

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DATE 1 October 1966

# JOINT INTELLIGENCE BUREAU

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THE SOVIET NORTH

(ECONOMIC ASPECTS)

JOINT INTELLIGENCE BUREAU  
Department of National Defence  
OTTAWA, CANADA



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THE SOVIET NORTH

Economic Aspects

Paper Prepared for the Advisory Committee  
on  
Northern Development

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## THE SOVIET NORTH

### Economic Aspects

#### CONCLUSIONS

1. A population of over five million is living in the Soviet North which contains seven cities with a population of 100,000 or over. The Soviet North is defined for the purposes of this paper to include those areas of the USSR north of 60°. The area produced virtually all of the national output of industrial diamonds, 95 per cent of the platinum, over 70 per cent of the refined nickel, 60 per cent of the cobalt, up to 50 per cent of the primary tin, nearly 50 per cent of the gold, 30 per cent of the fish catch, 20-25 per cent of the tungsten, 21 per cent of the commercial timber output, 15 per cent of the blister copper, and more than 80 per cent of the phosphate raw material produced in the Soviet Union. The second largest and most modern shipyard in the Soviet Union is located at Severodvinsk and is believed to be the lead yard for building nuclear powered submarines. An extensive transportation system has been developed in the European North. Water transport (seasonal in nature) and air transport have been extensively developed in the remainder of the area.

2. The most developed western (Kola-Karelia-White Sea) sector of the Soviet North is more accessible and is characterized by a less severe climate than any portion of the Canadian North, or than the Central and Eastern regions of Siberia.

3. While historically, economic activity in the North has often been carried on at a great loss according to Soviet calculations, there has in recent years been more emphasis on financial criteria. Despite the scale of development in the Soviet North, its main importance to the Soviet economy as a whole lies in the production of a few commodities. These must continue to be produced domestically if the Soviet Union is to maintain its policy of economic self sufficiency.

#### INTRODUCTION

4. The Soviet North, which we define as that part of the Soviet Union north of the 60th parallel has an area of about 3½ million square miles. This is roughly 40 per cent of the total area of the Soviet Union and approximately the same size as the mainland area of Canada. The present paper is concerned only with economic development in this vast area. There have of course been developments in the area in the defence field. These have centered around the use of the area as a forward base for possible air operations directed

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against North America, as a base for naval operations and for air defence facilities. The Northern Sea Route is used as a route for the transfer of naval vessels from the West to the Far East and the Novaya Zemlya area was used for the testing of nuclear weapons before the signing of the limited nuclear test ban treaty. With very few exceptions, the area has not been used for offensive missile deployment.

5. Physically, the mainland area may be subdivided into four major regions: (a) the European North, consisting from west to east of the Kola-Karelian Shield, the North European Plain and the Ural Mountains; (b) the West Siberian Lowland, a vast swampy tract between the Urals and the Yenisey River; (c) the Central Siberian Plateau between the Yenisey River and the Lena River; and (d) the East Siberian Highlands, the high mountainous region between the Lena River and the Pacific coast (Figure 1). The European North is linked to the southern, more populated regions of the country by a reasonably well-developed land transport net, but in the other three regions bulk transport is largely provided by the river systems and the Northern Sea Route. Air transport plays an essential role at all times of the year in the transport of passengers and priority cargo. The Arctic coast of the USSR extends for 4500 miles. This coastal area includes the islands and seas of the Arctic Ocean, a part of a broad gently sloping continental shelf 600-900 miles wide and 100-600 feet deep. Except in the extreme west the whole coastal area is covered with pack-ice for at least nine months of the year. A relatively narrow belt of tundra, or barrens, borders the coastal area. To the south of the tundra are the coniferous forests. North of the mainland are the five Soviet archipelagoes, island groups far less extensive than the Canadian Arctic Archipelago.

6. Although the climate of the Soviet North is analagous to that of the Canadian North, there are also major significant differences. The range in winter thermal conditions from east to west in the Soviet Arctic is far more pronounced than that observed on the North American side of the Pole. Winter temperatures in the central and eastern Soviet Arctic are very severe. The "cold pole" of the northern hemisphere is centered over eastern Siberia, where the average January temperature inland from the Arctic coast is -40° to -50°F as compared with an average January temperature of about -20°F in the Canadian Northwest Territories and -35°F at the North Pole. Winter temperatures in the extreme western sector of the Soviet Arctic, in the area of the Kola Peninsula and the White Sea, stand in sharp contrast to those of the central and eastern regions. In the west, the relatively warm current of the North Atlantic Drift penetrates northeastward into the Barents Sea. The

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Western portion of the north coast of the Kola Peninsula, including the port of Murmansk, remains ice-free all year, in comparison with an ice-free season of only two to three months along the coast of Central and Eastern Siberia. The average January temperature at Murmansk and Archangel is about 5 to 10°F, or roughly equivalent to that of Edmonton and somewhat milder than that of Sept Iles.

7. It is not surprising, therefore, that the extreme western section of the Soviet North, in the Kola-Karelia-White Sea area, has been developed far more intensively than other portions of the Soviet or North American Arctic. In addition to the climatic factor, the relative proximity of the Kola-Karelia-White Sea area to the markets and supply bases of the established centres of Russian economic life in the Leningrad-Moscow region has also facilitated the development of the area. Climate and accessibility, however, cannot alone account for a more intensive development of the Soviet North than that of the Canadian northlands. Even in the remote central Arctic, with its long cold winter, can be found a city such as Noril'sk which with its hinterland has a population over 150,000.

8. The Russians have been in their north for a very long time; they have lived around what is now Murmansk since the XI Century and had traversed most of Siberia by the end of the XVII Century. Nevertheless, it is only since the mid-1930's that intensive efforts have been made to develop and exploit the region. Soviet motives for this effort have probably undergone changes with the passing years. Original motives no doubt included the need to establish authority throughout the territory, the urge to conquer nature, the exploitation of exportable commodities such as timber and furs to finance domestic industrialization, the development of particularly high-grade mineral deposits, the desirability of finding useful, but distant, employment for political prisoners, and the requirement for a sea route to supplement the Trans-Siberian Railway. Finally, and superimposed on these reasons, are the strategic requirements - a sea transportation route to the Far East, air bases on the limits of Soviet territory, naval bases outside the Baltic Sea and to a very limited extent offensive missile bases.

9. Except for minor revisions of the Soviet-Finnish border after the Second World War in favour of the USSR, the latter has retained the same sub-Arctic territories which belonged to the Tsarist government. Further north in the Arctic, however, the Soviet Government has enlarged and defined its claims to sovereignty. In 1926 the Soviet Government published a decree claiming all land, including ice formations which are more or less

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immovable and all islands, in a triangle, the apex of which is the North Pole and which lies between the meridians of 32°4'34" East and 168°49'30" West Longitude. The eastern islands of the Svalbard Archipelago, which lie within this triangle, were accepted as belonging to Norway. In 1928 and again in 1950, the Soviet press, in authoritative articles, advanced a claim to the open polar seas, including drifting ice; and the entire triangle has long been shown on Soviet maps as defining Soviet territory. In addition, the Soviet Union claims a belt of 12 miles as territorial waters along all coasts of the USSR. While she has not made her position wholly clear as regards the Arctic high seas, it is to be presumed that she is always prepared to demonstrate a proprietary interest in the area defined by the decree of 1926.

#### Economic Administration

10. Initially, planned economic development of the Soviet North was controlled from Moscow under the auspices of two organizations, the Chief Directorate of the Northern Sea Route (GUSMP) subordinate to the Council of People's Commissars of the USSR (which later became known as the Council of Ministers) and the Chief Directorate of Construction of the Far North (Dal'stroy) subordinate to the Unified State Political Administration (which later became known as the Ministry of Internal Affairs). Dal'stroy was responsible for the development of Northeastern Siberia, while GUSMP was responsible for the development of the remaining areas in the North, although its primary task was the inauguration of a normally operating sea route. In 1963 GUSMP was abolished and its main responsibilities reallocated to various branches of the Ministry of the Merchant Fleet, including a new Chief Directorate of Sea Navigation (GUMP).

11. As the area was opened up, GUSMP's task was limited more and more to the operation of the Sea Route, and the Ministry of Internal Affairs (MVD) took over the development of the national resources throughout the North, in addition to the administration of Dal'stroy. In 1953, however, with the dissolution of the MVD empire, the responsibility for the administration of the economic enterprises was for the most part given to the appropriate Ministry; e.g., Dal'stroy became subordinate to the Ministry of Non-ferrous Metallurgy; the metallurgical combine at Noril'sk to the Chief Directorate of Nickel and Cobalt of the Ministry of Non-Ferrous Metallurgy; the Pechora Coal Mines to the Ministry of the Coal Industry, etc.

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12. Territorial administration of the northern area has always been in conformity with the rest of the Soviet Union as laid down in the constitution of 1963. The entire area north of the 60th parallel lay within the Russian Federated Socialist Republic (RSFSR). The main territorial administrative divisions within this area included two oblasts, (Murmansk and Archangel), and part of a third (the Tyumen Oblast); three Autonomous Republics (the Karelai ASSR, the Komi ASSR and Yakut ASSR); parts of two Krays (the Krasnoyarsk Kray and the Khabarovsk Kray); and seven National Okrugs (the Nentsi National Okrug, subordinate to the Archangel Oblast'; the Yamalo-Nentsi National Okrug and the Khanty-Mansi National Okrug, subordinate to the Tyumen Oblast'; the Taymyr National Okrug and Evenki National Okrug, subordinate to the Krasnoyarsk Kray; the Chukotsk National Okrug and the Koryak National Okrug subordinate to the Khabarovsk Kray) (Figure 2). The large number of Autonomous Republics, Krays and National Okrugs reflect the predominance of the native population in the North, and the low level of economic development at that time.

13. In 1940 the Karelian ASSR was raised in status to a Union Republic and at that time was given part of the territory ceded from Finland to the USSR. It was hoped that a strong Finnish ethnic group would develop, but this did not occur and in 1956 it reverted to an Autonomous Republic. In December 1953, the Magadan Oblast' was formed which incorporated most of the rayons where Dal'stroy was active, e.g., in the river basin of the Upper Kolyma, and in the Chukotsk Peninsula. Rayons where Dal'stroy was active in the Yakut ASSR, e.g., in the lower Kolyma, Indigirka, and Yana River Basins, came under the territorial administration of the Yakut ASSR. In January 1956, the Kamchatka Oblast' was separated from the Khabarovsk Kray and became an independent Oblast' of the RSFSR. When the administration of the Magadan and Kamchatka Oblasts became independent of the Khabarovsk Kray the administration of the Okrugs lying within their territory fell to the Oblast', i.e., the Chukotsk National Okrug to the Magadan Oblast' and the Koryak National Okrug to the Kamchatka Oblast'.

14. In July 1957, a general reorganization of economic administration occurred throughout the Soviet Union. Concurrently with this change the few remaining anomalies which had come into existence since 1932 were abolished, so that at the present time the economy of the Soviet North is administered in the same way as other regions in the Soviet Union. Regional Economic Councils (Sovnarkhoz) were established in the North as elsewhere in the Soviet Union, to administer specific economic regions the boundaries of which were made to conform with the existing territorial administrative regions. Each Sovnarkhoz was responsible for management of construction and industrial enterprises placed under their control, thus supplanting the central industrial ministries. The northern Sovnarkhozy included Murmansk, Karelia, Archangel, Komi, Yakut, Magadan and Kamchatka Sovnarkhozy, and the northern parts of the Krasnoyarsk and Tyumen Sovnarkhozy. Enterprises which formerly were subordinate to

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Dal'stroy in the Yakut ASSR were administered by the Yakut Sovnarkhoz, while those in the Magadan Oblast' were administered by the Magadan Sovnarkhoz.

15. In November 1959 the Kamchatka Economic Council was liquidated. At the same time, a Chief Directorate of the Far East Fishing Industry, RSFSR Council of Ministers, was established to administer all fishing enterprises formerly administered by the Kamchatka, Magadan, Sakhalin, Primorskiy and Kharbarovsk Regional Economic Councils. Fishing was by far the largest and most important industry which the Kamchatka Regional Economic Council had to administer, and with the loss of this industry, there was probably no real reason to justify the maintenance of the large administrative staff of an economic council. Also in November 1959 by a ukase of the Praesidium of the Supreme Soviet RSFSR, a change was made in the territorial boundary between the Archangel Oblast' and the Komi ASSR; the boundary of the Komi ASSR was extended to include the workers settlement Khal'mer-Yu and Tsementnozavodskiy, and the adjacent coal strata which are contiguous with the Pechora coal fields.

16. By decree of the Central Committee and the Council of Ministers dated 26 April 1961, 17 new economic districts were created throughout the Soviet Union for long term planning purposes. Co-ordinating and Planning Councils were formed to plan the work of the Regional Economic Councils lying within the larger Economic Districts. Four of the 17 new Economic Districts - the Northwest, the Urals, Eastern Siberia, and the Far East - are concerned with the future development of northern areas.

17. Another general reorganization of economic administration occurred at the close of 1962. As a result of this reorganization there was a change in the responsibility and size of the Sovnarkhoz. Hitherto these bodies administered construction and most of the industry lying within their territory. Under the new system, the responsibility for construction was transferred to the State Committee for Construction, while the Sovnarkhoz responsibility was extended to all industry including that formerly run by the Oblast' and City Soviets. At the same time Sovnarkhoz with similar industries were amalgamated and in the North this led to some combinations with Sovnarkhozy to the south, i.e., the Tyumen and Sverdlovsk Sovnarkhozy were united to form the Middle Urals Sovnarkhoz; the Kamchatka region was linked with the Sakhalin and Maritime Sovnarkhozy to form the Far Eastern Sovnarkhoz, and the administration of the paper and wood processing industries of the Vologda region was given to the North Western Sovnarkhoz which was formed by the amalgamation of the Archangel and Karelia Sovnarkhozy.

18. In October 1965, the plenum of the Central Committee of the Communist Party decided to abolish Khrushchev's regional economic

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councils and to revert to an extensive use of industrial ministries centralized in Moscow. Twenty-seven industrial ministries were established and made responsible for management of enterprises and development of their respective branches. In the Northeast, the Northeastern Economic Council was abolished and replaced by the Northeast Gold Association and the Yakut Gold Association. Transferred to the responsibilities of the Northeast Gold Association, was the administration for all heavy industry in the Magadan Oblast, which included the non ferrous industrial coal mining, electric power and machine building and in addition motor transport, roads, construction and construction materials; the light and food industries, on the other hand, as well as the State Farm's Trust was transferred to the execution committee of the Magadan Oblast'. A similar definition of the responsibilities of the Yakut Gold Association has not been noted, however, presumably it would have comparable responsibilities in the Yakut ASSR to those of the Northeastern Gold Association in the Magadan Oblast'.

#### Economic Activities

##### General

19. The Soviet North is not being developed as an independent economic region. The area has national economic importance with respect to certain key commodities, the main resources of which lie north of the 60th parallel. The rate at which the economy of the area is likely to grow depends to a large extent on how much the Soviet Government is willing to pay for self sufficiency in these products. It is estimated that the North contributes to the national economy virtually all the industrial diamonds, 95 per cent of the platinum, over 70 per cent of the refined nickel, 60 per cent of the cobalt, nearly 50 per cent of the gold (total Soviet production of gold is estimated to have been nearly 6 million oz. in 1965), up to 50 per cent of the primary tin, 30 per cent of the fish catch, 20-25 per cent of the tungsten, 21 per cent of the commercial timber, 15 per cent of the blister copper and 7.5 million tons of apatite concentrate (the source for over 80 per cent of the phosphate raw material for superphosphate fertilizer production). (See table 6). The shipyard at Severodvinsk, the second largest and most modern in the USSR, is believed to be the lead yard for building nuclear powered submarines.

20. In conjunction with the exploitation of natural resources particularly minerals and forests, the Russians set up supporting industries where possible to supply both the basic industry with building materials and the local population with food, clothing, building materials and services. Supply bases are thereby formed which facilitate the future development of other natural resources. However, the nature of industrial activity in the area will not generate growth on its own momentum.

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21. In the Yakut ASSR, a large administrative region in the Soviet North, over one third of the planned capital investment is allocated to the building of houses, cultural and public service and communal construction. A similar breakdown for all of the northern regions is not available but it is believed the Yakutsk ASSR is a representative region. In many of the larger centres of the North television stations have been erected.

### Industrial Production

22. Since 1958 there has been an increase in the gross output of all industry throughout the economic regions of the North (Table 1), but the rate of increase has been considerably higher in the eastern provinces, i.e., the Yakut ASSR, the Magadan and Kamchatka Oblast's. The higher growth rate in these areas can be attributed to the development of the diamond industry in the Yakut ASSR, the expansion of gold and tin mining in both the Yakut ASSR and the Magadan Oblast, and the rapid expansion of the fishing industry in the Kamchatka Oblast. While the greatest increase in growth rate occurred in the Eastern regions it is to be remembered that most of the industrial development in the North is located in the western regions.

23. Economic activity in the northern regions of Western Siberia and the Noril'sk area of the Krasnoyarsk Kray has steadily increased since 1958, but Soviet statistics on the gross output of industry in these areas are not available. In Western Siberia the activity has been associated with the exploration and development of oil and gas deposits, and the opening up of large timber reserves. In the Noril'sk area there has been a large expansion of mining and metallurgical operations based on the production of nickel, copper, cobalt, and precious metals.

Table 1

### Rate of Growth of Gross Output of all Industry

1958 = 100

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>
Archangel Oblast <sup>1</sup>	113	125	125	137
Murmansk Oblast <sup>1</sup>	108	114	116	133
Karelia ASSR	110	116	118	127
Komi ASSR	108	114	119	123
Yakut ASSR	113	130	156	175
Kamchatka Oblast <sup>1</sup>	106	125	155	167
Magadan Oblast <sup>1</sup>	109	118	137	155

Source: Naradnoye Khozyaystvo RSFSR 1962 (National Economy RSFSR in 1962) Moscow, 1963.

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Investment

24. It is estimated that the Seven Year Plan called for a total investment of about 10.5 billion roubles in the North. Table 2 on this page gives a very rough estimate of the investment in the individual northern administrative regions. Annual investment in building and civil engineering construction in the North is estimated to be about 1 billion roubles which is less than 5 per cent of the total Soviet investment in building and civil engineering and construction work in the USSR.

Table 2

Capital Investment in the Northern Administrative Regions in the  
Seven Year Plan (Estimated in Millions of Roubles)

<u>Administrative Region</u>	<u>Total</u>
Magadan Oblast <sup>1</sup>	900
Kamchatka Oblast <sup>1</sup>	531
Yakut ASSR	1,400
Krasnoyarsk Kray*	710
Tyumen Oblast <sup>1</sup> *	300
Komi ASSR	1,600
Archangel Oblast <sup>1</sup>	1,700
Karelia ASSR	1,535
Murmansk Oblast <sup>1</sup>	<u>1,770</u>
	10,516

\* In regions north of 60°.

Costs

25. Northern development is a high cost operation. According to Russian statistics it is reported that, on the average, operations in the North are from three to four times more costly than in developed areas and one and a half times more costly than in Eastern areas under development but without rail service. Two thirds of all capital invested in the development of a natural resource in the North is expended on the construction of roads and other transportation facilities, power stations, auxiliary enterprises and housing. Much of the higher costs can be attributed to labour costs. Wages including special benefits and area allowances are about 1.5 to 2.5 times as high as in the developed areas. It is estimated that each production worker requires three additional workers for service and maintenance.

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Increased mechanization is stressed, however, machines of special design are required for operation at low temperatures and such equipment is expensive. It is reported by the Russians that expenditure on local major overhauls exceeds the initial cost of a new machine.

#### Population

26. The Soviet North had a total civilian population estimated at 5,437,000 on 1 January, 1965. A breakdown of urban and rural population in the various administrative regions of the North for the years 1959 and 1963 is given in Table 3 together with an estimate for total population by region at the beginning of 1965. It will be noted that in the first six years of the Seven Year Plan the total civilian population in the North increased by 17 per cent. This is somewhat higher than the average natural increase in the Soviet Union which during the same period increased by 10 per cent. Fifty-four per cent of the increase occurred in the region to the West of the Urals which in 1959 contained 70 per cent of the population. Thus the European north continues to be more heavily populated and industrialized than the remainder of the north but the latter is growing at a faster rate. There has been a marked increase in the urban population throughout the North some of which has been at the expense of the rural population. There are two northern regions, the Karelia ASSR and the Archangel Oblast', where the rate of the population increase is below the average for the Soviet Union. In both regions forestry and associated industries are the basic activities.

27. Cities with a population of 50,000 or over include Archangel 303,000, Murmansk 272,000, Noril'sk 124,000 or over 150,000 if surrounding settlements are included, Vorkuta 68,000 or 188,000 if surrounding settlements are included, Petrozavodsk 157,000, Petropavlovsk-Kamchatka 134,000, Severodvinsk over 113,000, Yakutsk 89,000, Syktyvkar 94,000, Magadan 79,000, Monchegorsk over 54,000, Ukhta over 50,000.

28. Based on population statistics for the various native cultures in the Soviet Union as established in the Soviet census of 1959 the native population of the Soviet North is estimated to be about 800,000. The native cultures, their population and an estimate of the numbers living in the administrative regions in which they are primarily located are outlined in Tables 4 and 5 on pages 32 and 33, and the distribution is shown in Figure 3.

29. The total labour force in the North is estimated at over 2.5 million of which 85 per cent are classified as workers and employees and the remainder as Kolkhoz (collective farm) workers.

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In the initial stages of development large numbers of forced labourers were used to open up the area. Since 1953, however, there have been a number of amnesties and it would appear that most of the prisoners were released. Although many of them left the area, still larger numbers were induced to remain and settle locally. Large numbers of Komsomols (members of the Communist Youth Movement) were sent to the northern areas to replace some of the released prisoners. These changes entailed considerable adjustments in the patterns of development; more attention had to be given to the construction of houses, schools, clubs and other buildings for social welfare. Further, a training programme was established by most of the industrial enterprises both for the released prisoners and the Komsomols. As a consequence of these changes the number of labourers may be smaller particularly in the Northeast, but the labour force as a whole is more highly skilled. Over the past year there have been various references to a shortage of labour in the North, particularly at Noril'sk and the gold mining centres in the Northeast.

30. A decree on special privileges to northern workers was issued by the Praesidium of the Supreme Soviet USSR in February 1960. In areas designated as regions of the extreme north and including the Chukotsk National Okrug, the Koryak National Okrug and the islands of the Arctic Ocean (including the islands of the White Sea) there was little change from benefits previously offered. However, in other regions of the north described as areas of equal status with the Extreme North, special privileges were greatly reduced. Furthermore, workers in these areas are required to contract for a period of five instead of three years before they are entitled to any additional benefits.

#### Mining

31. Nickel, copper and cobalt are mined in the Murmansk Oblast' and in the Krasnoyarsk Kray (Figure 4). The main nickel copper deposits in the Murmansk Oblast' are located in the Pechenga area in the vicinity of Nikel and Zapolyarnyy. The ore is concentrated locally and shipped either to Nikel for smelting or directly to Monchegorsk for smelting and refining. Refineries for nickel and cobalt are located at Monchegorsk, but to date there is no evidence of a refinery for copper in the area. The first section of a new ore concentrating combine named Zhdanov, capable of handling 2,000,000 tons of copper nickel ore annually was opened at Zapolyarnyy in October 1965, and an even larger section was under construction which may have been opened in January 1966. Production of nickel and copper in the Murmansk Oblast' is estimated to have doubled in the past seven year period.

32. The largest nickel plant in the Soviet Union as well as the largest cobalt plant are located at Noril'sk in the Krasnoyarsk Kray.

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In addition the Noril'sk Metallurgical Combine operates an electrolytic copper refinery. By the end of 1963 the conversion to electric smelting of nickel concentrates was completed and the Combine has reached its 1965 production targets in respect to nickel, copper and cobalt. In 1962 exceptionally rich nickel ores were discovered at Talnakh about 12.5 miles northwest of Noril'sk. According to Soviet statements the Talnakh ores average 11 per cent copper and 4 per cent nickel while in some instances the copper content reaches a maximum of 24 per cent. This may be compared with the disseminated ores at Noril'sk which, again according to Soviet statements, before the discovery of the Talnakh ores, accounted for over 90 per cent of the reserves in the area and averaged 0.4 per cent copper and 0.3 per cent nickel. In June 1965 members of a Canadian delegation visiting Noril'sk were told that the Combine was processing 45,000 tons of ore per day. Assuming a 90 per cent recovery for copper and a 70 per cent recovery for nickel, the Noril'sk combine has an annual production of over 30,000 tons of nickel and nearly 60,000 tons of copper. A large expansion seems to be planned for the metallurgical operations at Noril'sk in conjunction with the development of the Talnakh deposits. On the 28th of December it was announced that a new ore dressing installation had been opened at Noril'sk and smelting operations could be operating at full capacity by the end of March 1966, which is the time scheduled for the Mayak mine at Talnakh to come into operation. Another large mine named Komsomol'skey is under construction to be ready for operation by the end of 1970. If Soviet plans are met it is estimated that by the end of 1970 the Noril'sk Combine may be producing over 60,000 tons of nickel and 170,000 tons of copper. The Soviet Union is currently exporting about 11,000 tons of nickel a year to the West and by 1970, it is estimated that they will have the capability to increase exports substantially.

33. The main gold mining regions in the Soviet Union are located in Northeastern Siberia in the upper regions of the Kolyma and Indigirka rivers, in the Aldan River Basin and in the Chukotsk peninsula, Figure 5. In the seven year period 1958-1965 gold production in the Magadan Oblast' showed an increase of about 86 per cent and in the Yakut ASSR nearly 40 per cent. Eight new placer mines were brought into production in the Chukotsk Okrug of the Magadan Oblast'. One new placer mine was brought into operation in the Yakut ASSR, located at Kular north of the arctic circle. Also in the Yakut ASSR a new gold concentrating plant was brought into operation at Nizhniy Kuranakh in the Aldan area. It is estimated that this will be one of the largest gold concentrating plants in the USSR, with a planned capacity of up to 2000 tons. To date 90 per cent of gold mining operations in the Northeast have been from placer operations - 1965 was the first full year of gold mining at the Kamenistyy Placer mine in the Kamchatka Oblast'. New gold mines were discovered in the Oblast' in 1965 so that in the near future production should show an interesting increase.

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34. It is estimated that up to twenty-five per cent of the national output of tin is mined in the Yana River Basin near Ege Khaya and Deputatskiy in the Yakut ASSR. Intensive survey work was carried out in 1963 between the Yana and Indigirka rivers in preparation for the construction of a large tin mining and concentrating plant. Included in the plans is a construction for river port, power station, airport and extensive housing. Construction is to start in 1966, but it is not likely that the plant will be in operation before 1970. It is estimated that the Magadan Oblast' is producing another 25 per cent of Soviet tin. Since 1958 tin production from the Oblast' has more than doubled, much of the increase coming from the expansion of activities in the Chukotsk Okrug at Pevek and Iul'tin. One of the largest tungsten plants is located at Iul'tin where tin is recovered as a secondary product.

35. Diamond deposits are under development in the Vilyuy River region in the Yakut ASSR at Mirnyy and Nyurba, and at Aykhal and Udachnaya about 250 miles north of Mirnyy. The Aykhal pipe which was discovered in January 1960, is reported to be larger and richer than either of the two pipes discovered earlier at Mirnyy and Udachnaya. It is estimated that in 1965 the Yakut ASSR produced about 7.8 million carats of diamonds of which up to 1 million carats may be gem diamonds. According to Soviet reports in the current 5 year plan production is to double so that production in 1970 may be in the order of 16 million carats. A large diamond concentrating plant with an estimated capacity of 7.8 carats is scheduled to be brought into production towards the end of 1966 about the same time as the Vilyuy Hydro Electric Station at Chernyshevskiy is commissioned. The expansion of diamond production in this area is to a large extent dependent upon the commissioning of this large hydro electric station. By 1970 the Soviet Union will more than likely be in a position to export industrial diamonds as well as gem stones.

36. The Yakut ASSR produces about 80 per cent of the phlogopite mica in the Soviet Union. It is estimated that production increased from 6,300 tons in 1958 to 9,500 tons in 1961. Phlogopite mica deposits have recently been discovered in the Kovdor area in the Murmansk Oblast'. The reserves so far surveyed near Kovdor amount to 4 million tons; this compares with a reserve of 3,000,000 tons in the Aldan region of the Yakut ASSR which heretofore have been considered the largest in the USSR. Development of the Kovdor deposits has not yet begun.

37. Iron concentrate is produced at Olenegorsk and Kovdor in the Murmansk Oblast', for consumption by the Cherepovets iron and steel mill. Annual production is estimated at 8 million tons and may reach 11 million tons in 1965.

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38. According to Soviet statements in 1965 the apatite combine at Kirovsk in the Murmansk Oblast<sup>1</sup> had the capacity to mine 18.8 million tons of apatite and produce 7.5 million tons of apatite concentrate. By 1970 these figures are to be increased to 33.6 million tons of ore and 14.5 million tons of apatite concentrate. Nepheline, which is found in association with the apatite ores is being recovered on a small scale and used in the Volkhov aluminium plant for the production of alumina. At the present time only about 30 or 35 per cent of the nepheline is extracted which amounts to between 1 and 2 tons of nepheline a year. However, the Soviets have suggested that the nepheline from these apatite ores should be shipped via the Northern Sea Route to the aluminium plants on the Yenisey thereby providing an inbound cargo for the ships in the timber trade. Aluminium is produced at the Nadvoitsy plant in the Karelian ASSR and at the Kandalaksha plant in the Murmansk Oblast<sup>1</sup>. While both of these plants have increased production over the past five years, through modernization and expansion, their total production is believed to be relatively small. Titanium and zirconium are probably being recovered from the processing of the apatite-nepheline ores.

#### Fuels and Power

##### Oil

39. Exploratory drilling for oil and gas is widespread in the North. Outstanding discoveries have been made in the Komi ASSR and Tyumen Oblast<sup>1</sup>, and promising discoveries in the Yakut ASSR, Magadan, Kamchatka and Archangel Oblasts<sup>1</sup>. The only significant commercial production of oil comes from the Komi ASSR, and the Tyumen Oblast<sup>1</sup>.

40. Both heavy and light oils have been produced in the Ukhta area of the Komi ASSR since the 1930's. At the beginning of the Seven Year Plan emphasis was given to increasing the production of heavy oils and by the end of 1960 much above-plan oil had been produced. However, about December 1960 a major discovery of light oil was made in the West Tebukh oil fields at a depth of 1,900 metres. This has proved to be the largest and richest deposit in the Komi ASSR. The heavy oils refined in this area yield products with a particularly low pour point which is most advantageous for Arctic operations.

41. A major oil and gas discovery has been made in the West Siberian lowlands extending over an area of 1,500,000 sq. kilometres, more than 75 per cent of which is North of 60°. Antrepov, the former USSR Minister of Geology predicted that this area would become the third oil centre in the Soviet Union. The quality of the oil is classed higher than the oils in the Volga-Ural deposits in that it is a light crude with a specific gravity of 0.831, and contains only 0.4 per cent sulphur. Commercial drilling for crude oil has started at 3 deposits Ust<sup>1</sup>Balyk, Megion and Shaim. In 1965, over 15,000 people were working in the petroleum fields. Oil production from the Tyumen Oblast<sup>1</sup> in 1965 exceeded 1 million tons, in 1966 it is to exceed 3 million tons and by 1970 production may have increased to up to 25 million tons annually.

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### Gas

42. There are three major gas bearing regions in the North; the Komi ASSR, the Northern regions of the Tyumen Oblast', and the Yakut ASSR. The Komi ASSR is the oldest gas producing region. Production in 1958 totalled 1.3 billion cubic metres. This was to have been trebled in the Seven Year Plan, but in 1962 production decreased to 939 million cubic metres. It may now have increased to one billion cubic metres.

43. The Russians have estimated that about one-third of Soviet gas reserves are concentrated in the Lower Ob' region of the Tyumen Oblast'. Soviet estimates of these reserves have varied between  $5 \times 10^{12}$  and  $21 \times 10^{12}$  cubic metres. Twenty-five natural gas concentrations have been discovered in the North of the Oblast' in the following rayons, Berezhovo, Novy Port, Pur, Taz and Konda. The Berezhovo and Konda areas are presently being developed. In 1966 production is planned to reach 4,000,000 cubic metres which should increase to 10,000,000 cubic metres by 1970.

44. The Yakutsk deposits are located at the mouth of the Vilyuy River, reserves are estimated  $500 \times 10^9$  cubic metres. New gas fields were discovered in 1963 near Lake Nedzheli in the Vilyuy basin, the reserves of which may surpass those of the earlier discoveries at the mouth of the Vilyuy.

### Coal

45. Deposits are well distributed throughout the North except in the Kola-Karelia area. The Pechora coalfield in the Komi ASSR is the only area of natural significance producing coal for other than local use. The Pechora coal is a good quality coal in that it contains less than 1 per cent of sulphur, is low in ash and virtually free of phosphorous. The coal produces a good hard coke which has a relatively high degree of purity. At the present time mining costs are high but it is argued in Russian literature that if the mines were expanded and modern methods of extraction introduced the costs could be reduced to below the cost of Donbass coal. In December 1964 a new mine was brought into production at Vorkuta with an annual capacity of 1.3 million tons of coking coal, and in 1965 another new mine went into production at Inta with an annual capacity of 1.2 million tons. Present production from the Pechora coalfields is in the neighbourhood of 18 million tons to be increased to 22 million tons by 1970 and 30 million tons in 1975.

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46. Coal production in Northeastern Siberia totals over 2 million tons per annum. The area in general is close to becoming self sufficient, however, there are some mining centres in the Chukotsk National Okrug and in the Yana River Basin where fuel supplies must be shipped in. The shipping season is short and if adverse weather conditions prevail, supplies might be delayed causing serious threats to production plans. At these centres the construction of atomic power stations has been considered.

#### Electric Power

47. Electric power is a major cost item in the development of isolated regions in the North and every effort is made to generate it as cheaply as possible. In the past most of the power was generated by a number of small stations based on local coal deposits or, in the Kola-Karelian area, small hydro power stations. The trend today is to build larger stations and transmit the power over greater distances. Stations with a capacity of 300,000 kw and over, are being constructed in Siberia, one is located on the Khantayka River north of the Arctic Circle about 60 km from the confluence of the Khantayka and Yenisey Rivers, the other at Chernyshevskiy on the Vilyuy River in the Yakut ASSR. The Khantayka plant is being built to serve the Noril'sk industrial complex as well as Dudinka, Igarka and other local settlements, while the Chernyshevskiy plant is being constructed to serve the diamond mining enterprises at Mirnyy and Aykhal. At Noril'sk in addition to the hydro electric station a second thermal station is being constructed. The decision was made to operate this station on coal from local deposits rather than gas piped from the Taz fields located some 250 miles distant.

48. In the Murmansk Oblast' on the Pasvik River, which forms part of the boundary between Norway and the Soviet Union, the Norwegians have built and put into operation for the Russians a 56,000 kw station the Borisoglebe. A site is presently being selected for another power station which will be constructed by the Norwegians and the equipment supplied by the Russians. The station is to have a capacity of about 50,000 kw. Work on the station will start in 1966. The Finns are also constructing a station in the Murmansk Oblast' for the Russians. The first unit of this 250,000 kw. station named the Upper Tuloma was put into service in December 1964.

49. An experimental tidal electric power station of under 1,000 kw capacity is under construction in Kislaya Bay on the Barents Sea near Murmansk. Construction of the station is to be completed by the middle of 1967. If the operation of this experimental station is successful, other tidal plants will be built in Lumbovskiy and Mezen Bays of the White Sea. The capacity of the Mezen Plant will be 1.3 million kw.

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50. The Soviet Union's first geothermic station started producing electricity on an experimental basis at Pauzhetka in the southeastern part of the Kamchatka Oblast'. It is to have a capacity of 5,000 kw.

51. In the Magadan Oblast' a 300 kw power line was completed between Pevek and Bilibino, thereby ensuring a more reliable supply of electricity to two major mining centres in the Northeast. The main power station is at present located at Pevek but a second large station is planned for construction at Bilibino where existing facilities are temporary diesel power plants. It has been announced that this station is to be an atomic power station to be in operation by the end of 1970. Construction has started on the extension of the Pevek-Bilibino transmission line to Zelenyy Mys. In the current five year plan the electric power output of the Magadan Oblast' is to increase by 35 per cent.

52. Throughout the Soviet North the majority of the thermal stations provide heat as well as power to the local community. In the new town of Mirnyy in the Yakut ASSR the heat will be supplied in the form of electricity. A new 18-family apartment building has recently been completed which is fully electrified.

53. On 24 January 1961 a plan was approved to redirect the flow of the Upper Pechora and Vychegda rivers through the Kama to the Volga. Survey work and the designing of future installations was to have been completed within a few years, while the building work, the filling of the reservoirs and the developing of new waterways will take seven years. Initial stages in the development programme include the construction of the Ust'Voya dam about 80 km above the town of Pechora on the Pechora River to form the Pechora reservoir and a second dam at Ust'Kulom on Vychegda River above the town of Syktyvkar to form the Vychegda reservoir. These two reservoirs will be linked by a south-flowing canal 60 km long, 250 metres wide and 30 metres deep. Another canal 100 km long will connect the Pechora and Vychegda reservoirs with the Kama. An earth dam and a power station of 700,000 kw is to be built on the upper Kama near Borovsk. A hydro electric station is planned at Ust'Izhma on the Pechora and the flow of the river is such that the station could have a capacity of one million kw. per annum.

#### Atomic Power

54. The construction of medium sized atomic power stations in certain areas where fuel supply is difficult can be expected, and the atomic station planned for Bilibino is believed to be of this size. Small mobile atomic power stations of 500, 1,000 and 1,500 kw. may be used in the early stages of development of an area, e.g. the West Siberian Plain.

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### Chemical Industry

55. A chemical industry is being developed in the three main industrial areas of the North. In the Murmansk Oblast' a superphosphate plant has been constructed at Kandalaksha, based on the apatite deposits at Korovsk. In conjunction with the metallurgical plants, sulphuric acid plants have been constructed at Monchegorsk in the Murmansk Oblast' and at Noril'sk in the Krasnoyarsk Kray. Although few details are available, it is believed that a chemical industry is developing at Ukhta or Vorkuta, based on local fuel deposits. A carbon black plant is located at Izhma producing 50 per cent of national output.

### Engineering Industry

56. By far the most important engineering industry in the North is Shipyard 402 at Severodvinsk. It is the second largest and most modern shipyard in the USSR and is believed to be the lead yard for building Soviet nuclear-propelled submarines.

57. Severodvinsk has two important and associated advantages as a Soviet shipbuilding centre. Ships are constructed in large covered building docks, the shipyard is about one mile from the commercial port, and the port is closed to foreign shipping. Accordingly, at Severodvinsk shipbuilding and trials can easily be carried on in a state of secrecy that would be most difficult to achieve in an area less remote. The associated advantage is that Severodvinsk is one of the very few large USSR shipbuilding centres with access to the open sea entirely through Soviet-controlled waters. Thus, Severodvinsk-built ships can progress with little risk of observation from drawing board to war station with the Soviet Northern Fleet. Against these advantages must be set two main disadvantages, (a) winter temperatures and ice conditions hamper sea trials and deliveries to the fleet for several months in the year; (b) the main industrial centres of the USSR, on which Severodvinsk depends for raw materials, components and skilled labour, are about 750 miles away.

58. In addition, there are important shipbuilding and repair facilities at Archangel and at Murmansk. At Archangel the Krasnaya Kuznitsa shipyard builds tugs and barges, and provides refitting facilities for northern sea route merchant ships. At Murmansk the Rosta dockyard, which is subordinate to the Soviet Navy, engages in conversion and repair work of naval ships of all sizes.

59. Otherwise the engineering industry in the North is more or less limited to small repair plants. One exception is the Onega Tractor Plant located at Petrozavodsk in Karelia ASSR. The Onega plant is an engineering industry of medium size, designing and producing tractors for the lumbering industry, both prototypes and in series. In 1963 the plant was being

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reconstructed. Plans called for the main site to be doubled and another site of about the same size to be located nearby; output is to be nearly trebled. In 1963 the plant was building an experimental amphibious tractor and in 1964 it was experimenting with the Onezhets 55, a trailer tractor with a 62 h.p. engine which was designed for the timber industry but could also be used on road construction. In April 1965 the Omega tractor plant was preparing to put the Onezhets 55 into serial production.

#### Construction and Building Material Industries

60. At various northern scientific centres, research is being done on all aspects of construction in the north, including the development of local raw materials for building purposes, construction design and techniques for construction on permafrost. At the Kola affiliate of the Academy of Sciences USSR a laboratory of building materials was organized in 1955-56 to develop a suitable building material using the slag wastes from the metallurgical operations in the area. Considerable research has been done at the All-Union Research Institute for Rare Metals and Gold in Magadan to develop a suitable building material for use in areas of extremely low winter temperatures.

61. Construction materials and techniques used in the development of isolated centres in the Soviet North are comparable to those used in Canada. However, economic development of the Soviet North is much more advanced than in the Canadian North and for the most part construction materials and methods used reflect normal Soviet practice. Throughout the Soviet Union timber for construction purposes is scarce and the Government encourages the use of a masonry building material manufactured from local raw materials or the use of pressed board made from wood shavings. These wood shavings plants are strongly encouraged in areas of the Far North where tree growth is sparse and trees are too small to produce saw logs.

62. There has been a marked increase in the production of prefabricated reinforced concrete construction materials in the Soviet North. In the first four years of the Seven Year Plan the volume of output increased from about 270,000 to nearly 700,000 cubic metres excluding the northern areas of the Tyumen Oblast' and Krasnoyarsk Kray. Cement plants have been established in the more highly industrialized regions; these include the Kola-Karelia area, Archangel, Tsementnozavodskiy, Vorkuta and Noril'sk. The plant at Vorkuta has been reconstructed and enlarged to three times its original capacity. A new plant is being constructed at Savinsk in the Archangel Oblast' and it was planned to construct a plant at Ukhta with a capacity 12 times that of the Vorkuta plant. At the present time the northeastern regions depend on the southern industrial areas for their cement supplies but a plant of 200,000 ton capacity is under construction at Bestyakh in the Yakutsk area. Plants for the production of pre-cast concrete slabs and blocks which may or may not be reinforced have been constructed throughout the north.

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63. Considerable effort is directed towards the development of a light weight concrete material with maximum insulating properties suitable for use in the precast plants. Some of the materials used in the north-east include keramzite gas or foam concretes and obsidian. Aluminium-plastic panels are being used for the first time industrially in the construction of the concentrating plant at Mirnyy. The panels have two layers, an external layer made of flat aluminium plates and an interior layer made of foam plastic. A new light-metal house capable of accommodating 30 persons has been developed for use in the extreme north. The house can be assembled in 2 weeks by a team of 8 workers. The walls of the houses are made of aluminium with an inner layer of Porolon, synthetic material. The walls of the houses while only 15 cm. thick can efficiently retain heat and withstand strong winds. The windows are of unbreakable plastic glass. In March 1965 the Russians announced the first such building had been assembled and put into use in the Soviet North.

#### Forestry

64. Timber operations in the Soviet North cut about 21 per cent of the total commercial timber cut in the Soviet Union. About 90 per cent of the timber cut in the Soviet North comes from the European North. In the first four years of the Seven Year Plan annual production increased at a rate of about 1.8 million cubic metres a year. This compares well with the Canadian average which is just over 1 million cubic metres a year, but it is less than the planned annual increase for the Soviet North. Much of the increase is dependent upon the construction of roads and railways into new areas (see paras 85 to 89). It would appear that the majority of the new roads or railways will be capable of transporting timber on at least part of their length in 1965 so that in the current year the commercial cut of timber from the North could increase to over 60 million cubic metres a year.

65. Virgin reserves are being opened up in the northern regions of the Tyumen Oblast' and in this area alone production is to increase from 1.3 to 6.5 million cubic metres in the Seven Year Period. It would appear that this development is proceeding on schedule. Saw milling operations at Igarka located in the Krasnoyarsk Kray are being expanded to handle increased timber exports. In 1963 some 700,000 cubic metres of timber were exported from the port of Igarka.

66. Emphasis is being given to the development of the pulp and paper industry throughout the northwestern region. Much of the increase in the timber cut will be consumed by pulp and paper combines. The first section of the pulp and paper plant at Kotlas in the Archangel Oblast' was opened in 1961. This is the largest pulp and paper combine in the Soviet Union. Another large timber industrial complex is under construction on the outskirts of Syktyvkar in the Komi ASSR. It is planned to be in operation in 1965 processing 3 million cubic metres of timber a year.

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### Fishing

67. About thirty per cent of total Soviet catch is from fishing enterprises in the North. The Murmansk Fishing Fleet has the largest annual catch, which in 1965 totalled 384,000 tons. Because of the consequences of the cooling of water in the Barents Sea the fishing fleet is being relocated, and greater emphasis is being placed on developing fishing grounds in the regions of Newfoundland, Greenland and Iceland as well as the northwest regions of the Barents Sea.

68. In the Far East the Kamchatka Fishing Industry which operates largely in the waters of the Okhotsk Sea has a catch exceeding 420,000 tons. A large scale effort is being given to increasing the catch from the North Eastern Pacific and Central Bering Sea Area. Considerable fishing, largely for local consumption is done in the estuaries of the northern rivers.

### Agriculture

69. Significant climatic features affecting agriculture are shown on Figure 7. A very high percentage of the territory north of 60° is favourable to some form of agriculture on a small scale. Initially the Russians were determined to develop all aspects of agriculture in all areas of the North. To-day however, more attention is being given to the cost of the operation. In general, the growing of grain and fodder crops in the north is costly, and is therefore discouraged by the authorities. The growing of vegetables, potatoes, cabbages and turnips, on the other hand, is encouraged, as well as the raising of dairy cattle and the establishment of poultry farms. The raising of reindeer is an important aspect of Soviet northern agriculture; currently these animals number close to two million.

### TRANSPORTATION

#### Water Transport

70. The Northern Sea Route together with the northern rivers forms a co-ordinated water transportation system of vital importance to the Siberian North since no other means exists of moving bulk supplies in the area.

#### Northern Sea Route

71. Since 1953 the Chief Directorate of the Northern Sea Route (GUSMP) has been subordinate to the Ministry of the Merchant Fleet (MMF), but has continued to function as an almost independent organization. However, following the 1956 navigation season on the Northern Sea Route, during which severe ice and weather conditions led to much dislocation of traffic, further administrative changes took place. A. Afanasev, a Deputy Minister

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of the Merchant Fleet, was appointed head of GUSMP, and the steamship agencies formerly controlled by GUSMP were placed directly under the Ministry of the Merchant Fleet. Subsequently the River Steamship agencies of all northern rivers were subordinated to the Ministry of the River Fleet of the RSFSR. In 1963 GUSMP was abolished and its responsibilities divided between appropriate directorates and agencies of the MMF including a newly created Chief Directorate of Sea Navigation (GUMP). This directorate is headed by A. Afanasev, the former head of GUSMP. At the same time the Department of Polar Stations of the Arctic and Antarctic Research Institute of GUSMP was subordinated to the Chief Directorate of the Hydro Meteorological Service attached to the Council of Ministers, USSR and organized into a Directorate of Arctic and Antarctic studies. These administrative changes were logical steps in the plan to co-ordinate all shipping operations and facilities and to subordinate them to either the Ministry of the Merchant Fleet or the Ministry of the River Fleet and indicate that the Soviets now consider the Northern Sea Route as a normal shipping operation with some special problems that can be handled at the regional level by the steamship agencies or other appropriate authorities.

72. The Northern Sea Route extends from Murmansk to Provideniya, a total of 4,600 miles. Most of the route is within sight of the mainland or the islands. Annual variations in ice conditions determine the dates for the opening and closing of navigation, but in general the season for through navigation lasts about 3 months from mid-July to mid-October. The most difficult ice conditions are usually experienced in the Vilkitskiy Strait, although in 1962 the Laptev Sea proved to be the most difficult area. Severe ice conditions were again encountered in the Laptev Sea in 1963, mainly in the western approaches to the Vilkitskiy Strait and in 1965 difficult ice conditions hindered shipping all season in the eastern area of the East Siberian Sea.

73. It is probable that well over 100 cargo vessels supported by ice-breakers use the Route every year and the modern larger and faster ships which use the Route in increasing numbers tend to make more voyages per season and carry increased tonnage. A small number of tankers use the Route and river barges, lighters and tugs operate in the vicinity of the river estuaries and engage in coastal voyages in the Central sector. The Route is used to transfer fishing vessels to the Far East and to deliver river vessels built in the western part of the Soviet Union, Czechoslovakia, East Germany and Finland to the Yenisey, Ob, Lena and other Siberian rivers. Some freighters made complete crossings of the Route, usually calling at ports along the Route and discharging or loading cargo but most serve ports east and west of Tiksi and then return to their home port. The duration of a complete crossing varies according to ice conditions and the number of calls made. In 1955, the Lena sailed from Archangel to Nagaev in 27 days.

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74. The annual turnover of freight has risen from 136,000 tons in 1933 to 880,000 tons in 1945 to over 2,500,000 tons in 1965 and may reach 3,000,000 by 1975. The export of timber from Igarka has been increasing annually, however the large numbers of newly constructed Russian timber carriers that have become available has materially reduced the number of foreign ships using the port.

75. In-bound cargoes consist mainly of food, fuel, construction materials and general supplies, while outbound cargoes include lumber, coal and some mineral products and fish products. Until 1957 most of the oil and gasoline delivered to northern ports was apparently shipped in barrels but in that year for the first time POL was delivered in bulk by tanker from the Black Sea to certain Northern Sea Route ports. It is probable that by now most major Northern Sea Route ports have facilities for the bulk storage of POL.

76. Since 1957, the Russians have on occasion declared extensive areas in the Barents Sea closed to shipping, usually when nuclear tests or naval manoeuvres have taken place in the area.

77. Over the years shipping activities on the Northern Sea Route have continued to expand and a considerable amount of effort has been expended in developing the ports along the Route and improving navigational facilities. It is believed that the provision of increased port facilities at most Northern Sea Route ports has kept pace with the increase in shipping and cargo turnover. Progress is also now being made towards building up an adequate fleet of modern icebreakers and icebreaking cargo ships which are a necessity if the Route is to become reliable under all conditions. To this growth, domestic shipyards have made their contribution; some of these, notably Severodvinsk near Archangel, are located in the North. Since the war some orders have been placed abroad for vessels designed for use in Northern waters. The most useful foreign acquisitions were the six Lena class vessels, diesel-electric icebreaker cargo ships of 7,500 tons, which were built in Holland. Their successors the new Amguema class now coming into service and the timber carrying ships now appearing in increasing numbers are having a significant effect in increasing the capacity of the route.

78. The atomic icebreaker Lenin and the Finnish-built heavy icebreakers Moscow and Leningrad together with ten small icebreakers, participated in icebreaking operations on the route in 1964 and 1965. There have been reports that the Lenin encountered some mechanical difficulties in 1960 although she participated in operations in that year. In 1961 little was heard of her until October when she made a remarkable double crossing late in the season to set up Drift Station NP. 10 and resupply NP. 8. She returned to Murmansk in November after setting out Drifting Automatic Radio Beacons (DARBS) and Drifting Automatic Radio Meteorological Stations (DARMS). She appears to have participated fully in operations in 1962, 1963 and 1964. There have also been some reports which compared favourably the performance of the new conventional icebreakers Moscow and Leningrad

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against the Lenin, in spite of the fact that they are of considerably less displacement. However, a delegation of Canadian officials who visited Russia in early 1964 to investigate Soviet icebreaking techniques were told by MMF officials that although it was originally feared that the Lenin might not be too successful, they were now pleased with her and that the decision had been reached to build two more triple screw atomic icebreakers about the same size as the Lenin but incorporating certain improvements. During a visit to Canada of Soviet shipping officials in early 1965 it was stated that in addition to the two nuclear icebreakers three new icebreakers of 30,000 SHP were to be built powered by gas turbines with diesels for cruising and manoeuvring. The addition of these new ships together with the acquisition of the Kiev of the Moscow class now building in Finland will more than double the existing icebreaker horsepower and probably indicates a considerable planned increase in traffic on the Sea Route during the next decade.

79. The building of additional icebreaking, research and expeditionary ships is planned and great attention is being paid to the hydrographic charting of the Arctic Ocean and in particular the Northern Sea Route. Much effort is also being put into long range ice reconnaissance and weather forecasting which is considered essential not only for navigational purposes but also for long range planning of seasonal traffic patterns along the Route and planning the provision of the necessary shipping for the short but intensive season.

80. Soviet statements on the future of the Route have tended to emphasize its importance as a trunk route. However, it appears more likely that its role will continue to be primarily that of a local supply route serving the expanding economy of the North and growing as the area is developed. In addition, it has and will continue to have, defence significance.

#### River Shipping

81. The river fleets on the great northward flowing rivers such as the Ob<sup>1</sup>, Yenisey and Lena are now undertaking an increasing role in the supply of northern settlements and the removal of their products. It is probable that with the modern river ships that are now being supplied in quantity together with the advantage of a longer and more predictable season, the river fleet freight turnover will expand faster and afford more competition with the Sea Route, particularly in the area of the Laptev Sea and the Yenisey gulf. There are indications that active steps are being taken to reinforce the river fleets with the most modern types of river ships, including Meteor and Raketa classes of hydrofoil craft, which are capable of speeds up to 38 knots and carrying 150 and 160 passengers respectively. It is expected that improved versions of the Meteor class fitted with gas turbines will be capable of speeds up to 54 knots.

82. It is estimated that the total annual tonnage carried on the northern rivers is somewhat in excess of 10 million tons, although it is believed that this tonnage includes the heavy tonnage moved on the southern sections of the Ob<sup>1</sup> and the Yenisey south of 60° N.

### Railways

83. Major railway development in the Soviet North is limited to the western region. Three railway systems serve this area; the October Railway, the Northern Railway and the Severdlovsk Railway.

84. The October Railway serves the area from Moscow west to Leningrad and the Finnish border. From Leningrad the Central Karelia branch goes north through Karelia to Yushkozero. The other branch runs from Leningrad to Murmansk and Severomorsk with a branch extending northwest to Kola, Pechenga and Nikel'. There are several minor branches such as the Pinozero-Kovdor and Kola-Nikel' ore lines which push westward as far as the Finnish border. Others, such as the Kem-Ukhta and Loukhi-Sofianga branches serve timber areas while the Rutji-Alakurtii-Salla line connects with the Finnish system and terminates at Kemi on the Gulf of Bothnia. There are indications that electrification on the Murmansk-Leningrad branch has been extended from Kandalaksha to Loukhi and that preparations are being made for conversion as far as Belomorsk. One report stated that 50 km. of new 600 km. railway had been completed between the Kola Peninsula and Karelia, however, there have been no indications as to either its terminals or alignment. Other reports of construction are equally vague and may refer to electrification, double-tracking or relocation.

85. The mainline of the Northern Railway runs from Aleksandrov to Archangel'. Branches connect with the October system at Bezhetsk, Pestovo, Cherepovets and Malega while others link with the Gorkiy Railway at Novki Svecha and Pinyug. The main Northern branch stretches over taiga and permafrost from Konosha to Vorkuta and Khal'mer-Yu although some reports have indicated its extension to Kara on the Kara Sea. This is considered to be doubtful. Branch lines run from Kotlas, Pinyug and Mikun to the timber tracts around Syktyvkar and from Chum to Labytnangi on the Yenisey.

86. It now appears that a direct route from Archangel' to Leshukonskoye has been abandoned and that the new plan is to build the line to Karpogory (63° 59' N - 44° 27' E). Rails have been laid for a distance of 40 km. east of Archangel'. The intention may be to lay the track north-east from Karpogory to Leshukonskoye or to an extension of the Mikun-Koslan line. Either possibility will permit the exploitation of more timber resources than a direct Archangel'-Leshukonskoye alignment would allow.

87. The introduction of diesel locomotives and the laying of double track is continuing on the Konosha-Vorkuta branch of the Northern railway. No new information has been received on the Mikun-Syktyvkar-Fosforitnaya, Mikun-Koslan or Sosnogorsk-Troitsko Pechorsk branches.

88. The Sverdlovsk system has a 360 km. line running northward to Polnochnoye. From Ivdel a 368 km. branch is under construction to Serginy (62° 30' N - 65° 38' E) on the Ob' river. Although the railway has been reported operational as far as Kondinskiy station (220 km), no word has been received of its final acceptance. One report stated that regular trains were running to the 336 km. post but it is probable that this was railway construction traffic and possibly some light lumbering equipment. Ballasting and track laying are now reported to be in process on the banks of the Ob' river.

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89. Work is continuing on the Tavda-Sotnik-Uray railway line to exploit the timber and oil reserves of this region of the Tyumen. One hundred km is now operational out of Tavda and plans call for an additional 40 km. to be constructed this year.

90. The Tyumen-Tobol'sk-Surgut railway was begun in 1965 to connect the Trans-Siberian railway to the Surgut sector of Tyumen Oblast's oil and gas deposits. Construction is in progress from both ends of the Tyumen-Surgut line as well as from Tobol'sk. The alignment of the Tyumen-Tobol'sk sector is believed to be very similar to the highway route between the two terminals.

91. A 20 km. Norilsk-Dudinka branch line has been completed from Talnakh to Norilsk. This connects the Norilsk mining and metallurgical combine to the Mayak copper-nickel ore mine. Although the Norilsk-Dudinka line is still reported to be only 60-66% electrified, the implementation of plans for electrical power facilities at Norilsk and Khatayko should hasten the conversion.

#### Roads

92. The Soviet Union has placed a high priority on the development of its road network however northern development is still very slow. Most roads are auxiliary to the rail system and widespread winter road construction continues annually. Progress is being made on the Leningrad-Murmansk highway and the Kandalaksha-Murmansk section across Lake Imandra is now open. No new details of the route or the expected completion date have been received. A road is also under construction between Vologda and Archangel. There is very little information on this route which will start at the new Dvina bridge, go to Kholmogory and then to Yemetsk. From there, it will probably pass through Priluki and Velsk. Thirty kilometres have reportedly been built out of Archangel and construction is under way at Kholmogorsk and Yemetsk. This may be reconstruction or alignment of an existing road.

93. In the Tyumen the winter roads are claimed to total 2,000 km. Most of these, such as the Shaim-Tyumen and Surgut-Tyumen roads are built to facilitate the exploitation of oil and gas fields. The shortage of crushed rock and the brief construction season have hampered asphalt road construction considerably.

94. In Magadan Oblast work is continuing on a new road from Pevek to Bilibino and Zelenyy Mys. In addition, a new 240 km. winter road has been built to Baranikha with 160 km. laid on Arctic Ocean ice. It is not clear whether the terminus is Pevek or Zelenyy Mys.

#### Pipelines

95. During the last twelve months work proceeded quickly on the 1,306 km. Ust' Balyk - Omsk oil pipeline. This line will run from Ust' Balyk (61° 04' N - 72° 38' E) to the Irtysh at Demyantskoye (52° 12' N - 77° 26' E) and then along the Irtysh to the Omsk oil refinery where it will link with

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the Trans-Siberian pipeline. In April, the 90 km. Ust<sup>1</sup> Balyk - Belensk section was ready for insulation and laying. Three pumping stations will be installed but their locations and the date of the 1,020 mm. line's completion have not been ascertained. Aircraft have been employed extensively in delivering pipe and construction equipment to the pipeline site. The second major oil pipeline into the Tyumen Oblast<sup>1</sup> is the Shaim-Tyumen line. It is 436 km. long, approximately 25 inches in diameter, and has been partially commissioned. During 1965 over 1,000,000 tons of oil were extracted from Tyumen Oblast<sup>1</sup> and thirty-five wells are now feeding the Shaim and Ust<sup>1</sup> Balyk collection points.

96. Natural gas deposits in Tyumen Oblast are estimated to be 5,000,000,000,000 cubic metres, however, there is only one major pipeline currently available to tap these reserves. The Igrim-Serov line is 503 km. long with a throughput of 10,000,000,000 cubic metres per annum. This pipeline is being extended from Serov to Nizhniy Tagil where a junction will be made with the Bukhara-Urals gas pipeline. A new 3,500 km. pipeline is being planned to transport Siberian natural gas from Salekhard through Ukhta and Konosha to Leningrad and Minsk. The pipe diameter will be 1,200-1,400 mm. and the plan is to have the first stage completed by 1971. Since the Soviet Union is experiencing difficulty in securing large diameter pipe however, there may be considerable slippage in this construction program.

97. Over 200 km. of the 400 km. gas pipeline from Ust-Vilyuy to Yakutsk has been completed. Part of this line, scheduled to begin pumping in late 1966, runs above the permafrost with elbows every 150 km. This design compensates for temperature fluctuations while the remainder of the line uses a different grade of steel to permit its burial underground.

#### Civil Air Transport

98. Civil aviation in the Soviet North is controlled entirely by the All-Union Ministry of Civil Aviation which was formed in July, 1964. Until early 1960 a sizeable, though relatively decreasing, part of northern civil aviation was under a separate organization, the Directorate of Polar Aviation of the Chief Directorate of the Northern Sea Route. Polar Aviation, however, retains its identity as a Directorate within the Civil Air Fleet structure. It continues to operate a few scheduled air services but its major role appears to be that of carrying out specialized tasks such as ice reconnaissance, meteorological and hydrological support work, the establishment of and logistical support to drift stations and high latitude expeditions as well as cargo and passenger operations on an "as required" basis.

99. Air transport often provides the sole form of all-year movement to a large number of northern communities including such major centres as Tiksi, Noril'sk, Yakutsk and Magadan. A great deal of the transport flying in the Arctic, especially to the smaller communities and settlements is done on an "as required" basis. However, major scheduled services are flown, including the trans-northern route which provides regular service from Moscow across the northern periphery to the Chukotsk Peninsula and north-south routes which connect northern points such as Archangel, Vorkuta, Noril'sk and Magadan with cities in the south and the main civil aviation arteries. Turbo-prop aircraft are being used in the Soviet north on an increasing scale for moving cargo and passengers on regular services. These aircraft now provide services

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between Moscow and Leningrad, Murmansk, Archangel, Tiksi, Magadan, Yakutsk and the Chukotsk Peninsula. Such aircraft, because of their speed and high carrying capacity, are of great importance in northern operations as they are elsewhere in the Soviet Union. The trend toward the universal use of modern aircraft in the north is expected to continue. The latest types to be introduced in the north are the TU-124 and AN-24 turbine powered aircraft, capable of operation from short runways and with speed, range and payload which should make them good aircraft for northern service. The AN-12 turboprop freighter aircraft is regularly used for airlifting large loads to northern centres, and the very large MI-6 helicopter is being used on an increasing scale in the exploitation of oil and gas resources.

100. It is estimated that over 1,300 aircraft are active in northern civil aviation operations. About one-half of these are single-engined aircraft, with the remainder split between twin-engined aircraft (LI-2s and IL-14s) and helicopters. The ratio of twin-engined aircraft is expected to increase as these, especially IL-14s are released from main civil aviation routes through replacement by turboprop and jet aircraft.

101. Little information is available on civil aviation repair and maintenance facilities in the north, or on passenger handling facilities at northern airports. While neither type of facility is thought to be elaborate, they are undoubtedly adequate for the task, although there have been public complaints about the inadequacy of facilities for passengers throughout the whole of the civil air system. It is believed that major overhauls are done outside the north, and despite the growth of civil aviation in the region this will probably continue to be the case.

102. The Soviet Arctic is well supplied with an extensive network of at least 150 airfields, ranging from major bases with hard-surfaced runways of 6,000 feet or greater and well-developed ancillary facilities, to minor strips taking only light aircraft. The majority are believed to have prepared natural-surface runways 2,500 to 5,000 feet long and capable of taking aircraft up to LI-2 (Dakota) and in many cases IL-14 size. Two of the military airfields, one in either extremity of the Soviet North, at Olen'ya and Anadyr', have concrete runways of at least 11,500 feet and are among the largest airfields in the Soviet Bloc. The main development of major airfields with hard-surfaced runways has taken place in the two extremities of the Soviet North -- the Kola-White Sea area and northeast Siberia. Extending along the central Arctic coast between these two areas is a string of airfields some of which may now be equipped with hard-surfaced runways. Airfields are located throughout the Arctic at points of settlement, from main cities such as Archangel and Noril'sk to very minor settlements. Both civil and military aircraft share most of the major airfields, except in the Kola-White Sea area where there are a number of purely military air bases.

103. An important feature of air operations in the Soviet North is the use during the winter months of extended snow and ice runways, increasing the capacities of many airfields. Airfields which during the summer are suitable for twin engine transports can be used by much larger aircraft during the winter season.

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Sea-ice surfaces are also used, particularly in the mounting and supply of the drift stations which to date have involved hundreds of landings on the ice of the Polar Pack. Aircraft making such landings have included piston-engined medium bombers serving as transports as well as large turboprop freighters.

104. The value of aviation in this vast area is much greater than the number of its aircraft or the scale of its operations would suggest. Though it carries only a very small percentage of all freight moved in the North it is of vital importance in the movement of passengers and high priority freight and for much of the year it performs a unique function, for its operations are carried out on a year-round basis. The only interruptions (apart from weather) occur at certain airfields during the breakup period. It is also of great importance to the administration of the North, providing rapid all year transport within the region, to Moscow and to other areas of the USSR.

#### Some Aspects of Scientific and Survey Activity

105. The Soviet Union's scientific and surveys programmes in the Arctic far exceed those of any other nation. Some of these programmes are designed to support merchant shipping activities along the Northern Sea Route and other transport activities in the North. Meteorological research, hydrographic surveys, geophysical and other investigations also contribute to military operations and economic development in the area.

106. The main agency responsible for scientific services and research in the Arctic is the Arctic and Antarctic Scientific Research Institute of Leningrad. A number of other agencies, however, perform additional survey and research functions in the area.

107. A network of over 100 coastal and island polar stations including five observatories conduct meteorological, hydrological and in some cases geophysical observations on a regular basis. During the shipping season the entire Northern Sea Route is covered by air reconnaissance.

108. The most publicized form of Arctic research in recent years has been related to the drifting ice stations and high latitude air expeditions in the Polar Basin. At the drift stations a team of scientists and workers carry out meteorological, oceanographic and geophysical investigations during the year. Since the establishment of North Pole 2 in 1950 Soviet drift stations have remained manned for periods ranging from less than one to almost four years. At the present time there are two stations in operation, North Pole 13 established in February 1963 and North Pole 15 established in the Spring of 1966. In February, 1963 it was reported in Pravda that members from the Acoustical Institute of the Academy of Sciences of the USSR would form part of the scientific party working on the drift stations.

109. In addition to the annual resupply and remanning of the drift stations, the high latitude expeditions also include landings by airborne scientific groups at various points. According to the Soviet press over one thousand such landings were to be made on the ice cap in 1964. For some years airborne groups have also been employed in setting out Drifting Automatic Radio Meteorological Stations (DARMS) and Radio Beacons on the ice pack.

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110. Research is done on the vast territory between the Franz Josef Land Archipelago, the North Pole and the Chukotka Sea. A special team is compiling an oceanographic map of the Polar Basin and aerial photographic work is being carried out for the programme of research on the ice cover. Scientists have also made deep sea soundings in the Arctic Ocean, measurements of water and meteorological observations as well as studies of the "thermal" budget of the arctic basin, the state of the magnetic field of the earth and the physical properties and distribution of ice in the ocean.

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Table 3

POPULATION OF THE SOVIET NORTH, 15 JANUARY 1959, 1964\*, AND 1965  
(in thousands)

Administrative Region	Population 1959			Population 1964			Population Total 1965 (estimated)	Percentage of Increase in Population 1959-1965 (estimated)	Percentage of Total Population in the North
	Total	Urban	Rural	Total	Urban	Rural			
Archangel Oblast	1,278	677	601	1,379	894	485	1,405	9.9	26
Komi ASSR	806	475	331	930	585	345	959	18.6	18
Murmansk Oblast	567	524	43	671	639	32	699	22.6	13
Karelia ASSR	651	409	242	683	469	214	691	6.4	13
Tyumen Oblast**	186	55	131	231	97	134	236	26.8	4
Krasnoyarsk Kray***	225	199	26	240	214	26	245	8.8	5
Magadan Oblast	235	190	45	294	251	43	311	31.2	6
Yakut ASSR	488	240	248	597	324	273	624	26.4	11
Kamchatka Oblast	220	140	80	253	178	75	261	18.	5
	4,656	2,909	1,747	5,145	3,493	1,652	5,431	17.	

\*From Narodnoye Khozyaystvo SSSR 1963  
(National Economy USSR in 1963) Moscow 1965

\*\*Includes: Khanty-Mansiyskiy National Okrug 1959  
Yamalo Nenetskiy National Okrug

	Total	Urban	Rural		Total	Urban	Rural
	124,000	33,000	91,000	1964	165,000	72,000	93,000
	62,000	22,000	40,000		66,000	25,000	41,000

\*\*\*Estimated for areas North of 60°

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Table 4

Native Population

<u>Cultural Groups</u>	<u>Population</u>	% which still consider the language of their culture to be their native language	<u>Estimate of Numbers living in the Administrative Regions of the North</u>	
			<u>Admin. Region</u>	<u>Population</u>
Nentsy	22,800	85.7	Nenets National Okrug Murmansk Oblast	22,000 1,000
Evenki	24,000	53.9	Yakut ASSR Krasnoyarsk Kray	14,000 10,000
Khanty	19,000	77.0	Khanty Mansi Nat. Okrug	19,000
Chukchi	12,000	93.9	Chukotsk Nat. Okrug	12,000
Evenyy	9,000	81.8	Yakut ASSR Chukotsk Nat. Okrug Koryak Nat. Okrug	8,000 500 500
Koryaki	6,200	90.5	Koryak Nat. Okrug	6,000
Mansi	6,000	59.2	Khanty-Mansi Nat. Okrug	6,000
Saamy	1,800	69.9	Murmansk	1,800
Eskimosy	1,100	84.0	Chukotsk Nat. Okrug	1,100
Itel'meny	1,100	36.0	Koryak Nat. Okrug	1,100
Nganasany	700	93.4	Komi ASSR	700
Yukgiry	400	52.5	Yakut ASSR	400
Komi and Komipermyaki	426,000	86.7	Komi ASSR	284,000
Yakuty	236,000	97.5	Yakut ASSR	235,000
Karely	164,000	72	Karelian ASSR	<u>164,000</u>
			TOTAL	787,100

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Table 5

Native Population by Administrative Regions - 1959

<u>Administrative Region</u>	<u>Cultural Group</u>	<u>Estimate of Native Population</u>
Murmansk Oblast <sup>1</sup>	Nentsy	1,000
	Saamy	<u>1,800</u>
	TOTAL	2,800
Archangel Oblast <sup>1</sup>		
Nentsy National Okrug	Nentsy	23,000
Karelian ASSR	Karely	164,000
Komi ASSR	Nganasany	600
	Komi-Komipermyaki	<u>284,000</u>
	TOTAL	284,600
Tyumen Oblast		
Khanty-Mansi Nat. Okrug	Khanty	19,000
	Mansi	<u>6,000</u>
	TOTAL	25,000
Krasnoyarsk Kray		
Evenkiy National Okrug	Evenki	10,000
Taymyr National Okrug	Nentsy Yakuty	
	Nganasany	<u>6,000</u>
	TOTAL	16,000
Yakut ASSR	Yakuty	230,000
	Evenki	14,000
	Eveny	8,000
	Yukagiry	<u>400</u>
	TOTAL	252,400
Magadan Oblast <sup>1</sup>		
Chukotsk National Okrug	Chukchi	12,000
	Eveny	500
	Eskimosy	<u>1,100</u>
	TOTAL	13,600
Kamchatka Oblast <sup>1</sup>		
Koryak National Okrug	Eveny	500
	Koryak	6,000
	Itel'many	<u>1,100</u>
	TOTAL	7,600

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Table 6

ESTIMATED OUTPUT OF SELECTED COMMODITIES IN THE SOVIET NORTH  
(in metric tons unless otherwise specified)

Commodity	Administrative	Estimate of Production				Estimate of Percentage of National Output	Remarks
		1958	1964	1965	1970		
<u>METALLURGICAL PRODUCTS</u>							
Apatite (concentrate)	Murmansk Oblast <sup>1</sup>	3,000,000	6,400,000	7,500,000	14,500,000	More than 80	Percentage of national output of phosphate raw material
Cobalt	Krasnoyarsk Kray*	300	600	675			
	Magadan Oblast <sup>1</sup>	280	450	675			
	Total	580	1,050	1,350		60	
Copper	Krasnoyarsk Kray*	50,000	60,000	65,000			
	Murmansk Oblast	10,900	20,000	30,000			
	Total	60,900	80,000	95,000	160,000	14	
Diamonds (carats)	Yakut ASSR	500,000	4 - 6 million	7 - 8 million	16	97	
Gold	Magadan Oblast <sup>1</sup>	34	59	65			
	Yakut ASSR	16	17	21			
	Total	50	76	86	120	47	

\* North of 60°

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TABLE 6 Continued

Commodity	Administrative	Estimate of Production				Estimate of Percentage of National Output	Remarks
		1958	1964	1965	1970		
Iron (concentrate)	Murmansk Oblast <sup>1</sup>	1,200,000	8,000,000	11,000,000		Less than 1	
Mica (Phlogopite)	Yakut ASSR	6,300	9,500	14,000		80	
Nickel	Krasnoyarsk Kray*	20,000	35,000	35,000			
	Murmansk Oblast <sup>1</sup>	20,000	40,000	45,000			
	Total	40,000	75,000	80,000	115,000	70	
Platinum (ounces)	Krasnoyarsk Kray*	180,000	300,000	300,000			
	Murmansk Oblast <sup>1</sup>			45,000		95	
	Total			345,000			
Palladium	Krasnoyarsk Kray	360,000	600,000	720,000			
	Murmansk Oblast <sup>1</sup>			90,000			
	Total			810,000			
Selenium	Krasnoyarsk Kray	25	100	130			
Tin (contained in concentrate)	Yakut ASSR	3,000	4,000	3,500			
	Magadan Oblast <sup>1</sup>	2,000	3,500	3,500			
	Total	5,000	7,500	7,000		40 - 50	
Tellurium	Krasnoyarsk Kray*	3	10	15			
Tungsten (60% con- centrate)	Magadan Oblast <sup>1</sup>		4,000	4,000		20 - 25	
ENERGY FUELS							
Coal	Komi ASSR	16,800,000	18,000,000	18,000,000			
	Krasnoyarsk Kray*	2,200,000	2,400,000	3,000,000			
	Magadan Oblast <sup>1</sup>	800,000	1,500,000	1,500,000			
	Yakut ASSR	718,000	1,100,000	1,200,000			
	Total	20,518,000	23,000,000	23,700,000			



TABLE 6 Continued

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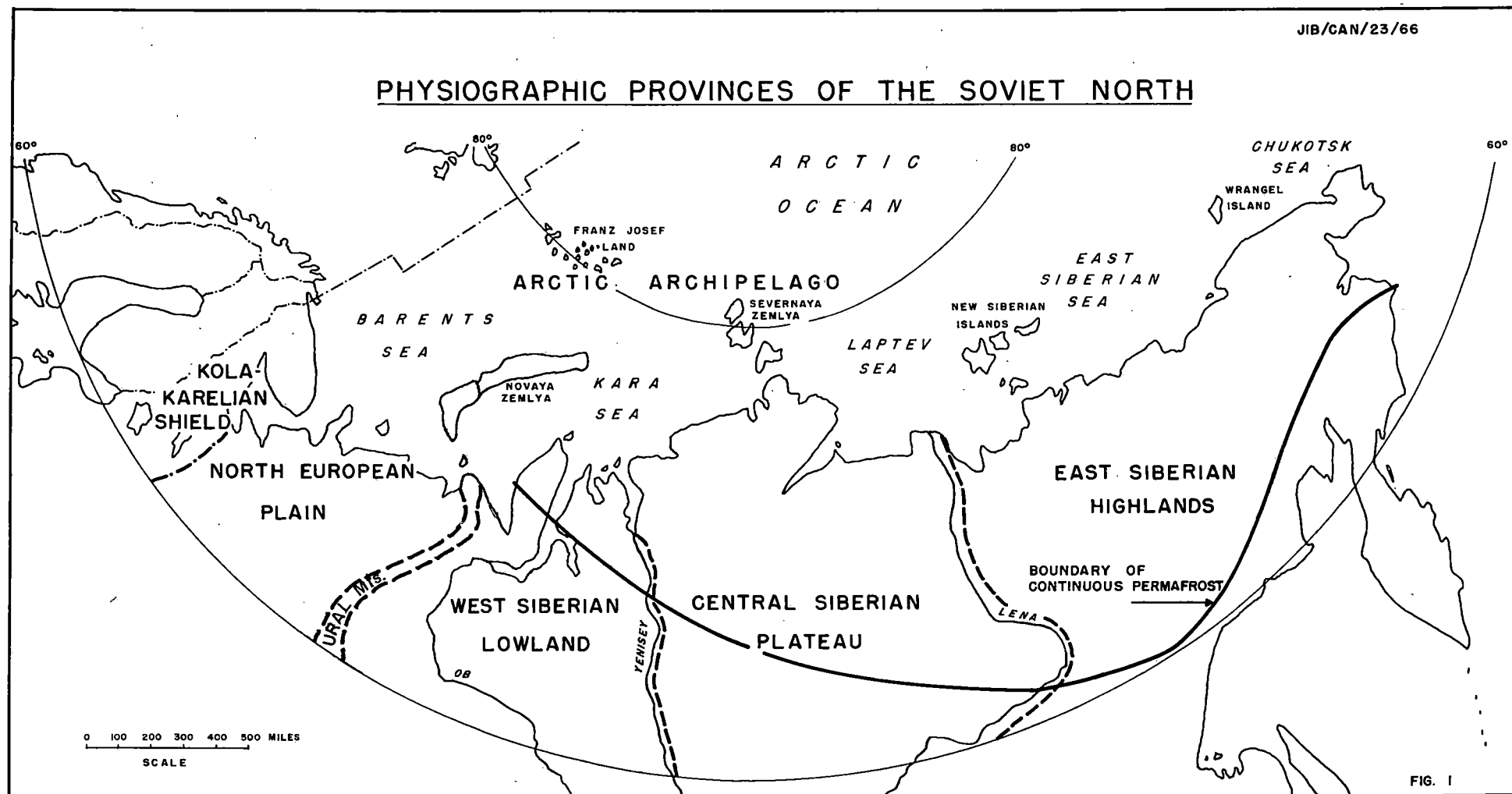
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Commodity	Administrative	Estimate of Production				Estimate of Percentage of National Output	Remarks
		1958	1964	1965	1970		
Crude Oil	Komi ASSR	1,000,000	1,600,000	2,500,000			
	Tyumen Oblast <sup>1</sup>		500,000	1,000,000			
	Total	1,000,000	2,100,000	3,500,000		1	
Gas (thousands of cu. metres) (latest production figures are for 1962)	Komi ASSR	1,300,000	939,000	1,000,000	1,000		
	Tyumen Oblast <sup>1</sup>						
	Yakut ASSR						
	Total	1,300,000	939,000	1,000,000		5	
Commercial Timber (cu. metres) (latest production figures are for 1962)	Murmansk Oblast <sup>1</sup>	1,521,000	1,616,000				
	Archangel Oblast <sup>2</sup>	17,134,000	26,000,000				
	Komi ASSR	11,129,000	13,745,000				
	Karelia ASSR	13,303,000	14,767,000				
	Total European North	43,087,000	56,128,000				
	Tyumen Oblast <sup>1</sup>	1,300,000	2,200,000				
	Krasnoyarsk Kray*	100,000	800,000				
	Yakut ASSR	1,379,000	1,647,000				
	Magadan Oblast <sup>1</sup>	245,000	270,000				
	Kamchatka Oblast <sup>1</sup>	365,000	312,000				
	Total	46,476,000	61,357,000	60,000,000			
Fish Catch	Murmansk Oblast <sup>1</sup>	568,000	795,000	884,000			
	Kamchatka Oblast <sup>1</sup>	250,000	410,000	422,000			
	Others	180,000	250,000	300,000			
	Total	998,000	1,455,000	1,606,000		30	

\* North of 60°

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# TERRITORIAL ADMINISTRATIVE REGIONS OF THE SOVIET NORTH

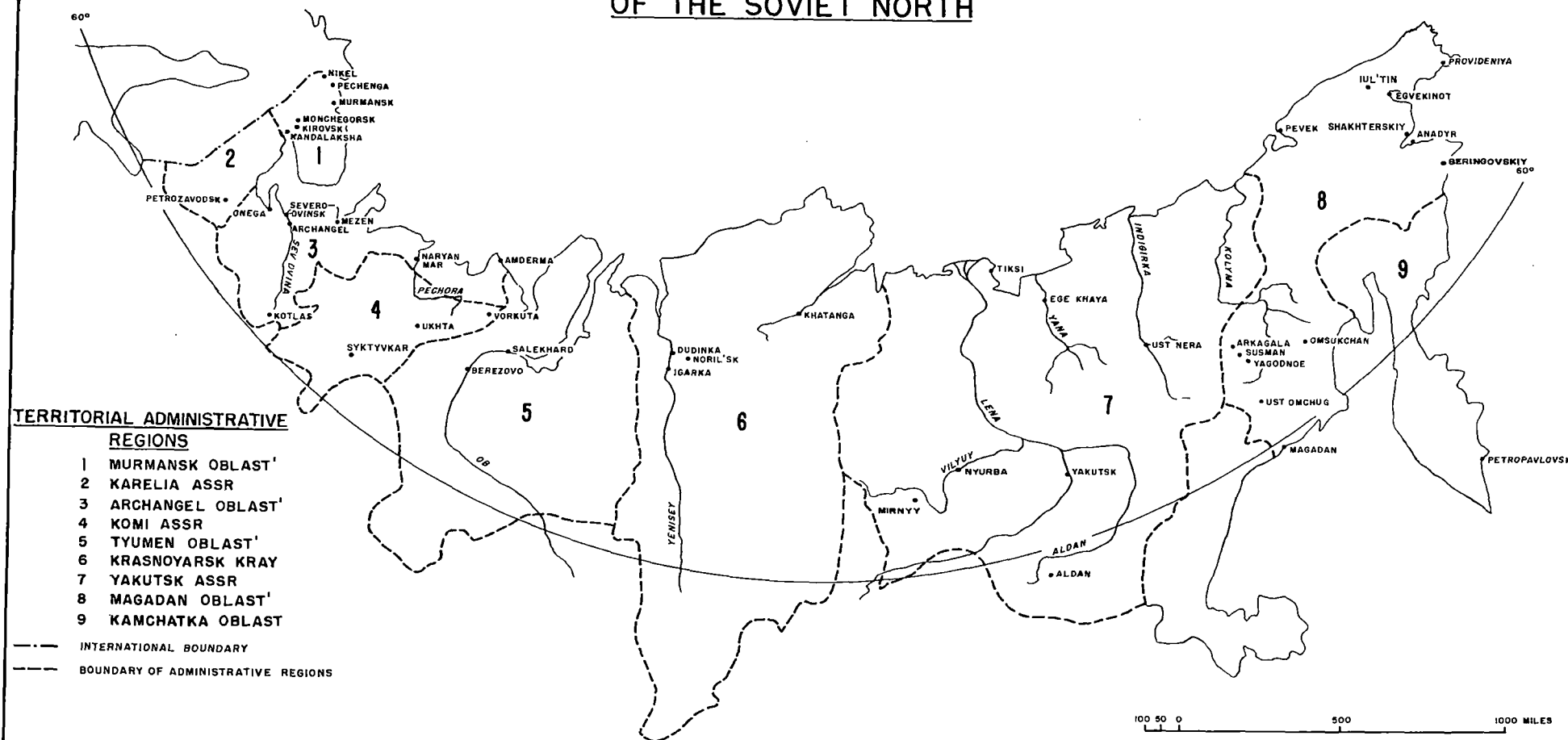
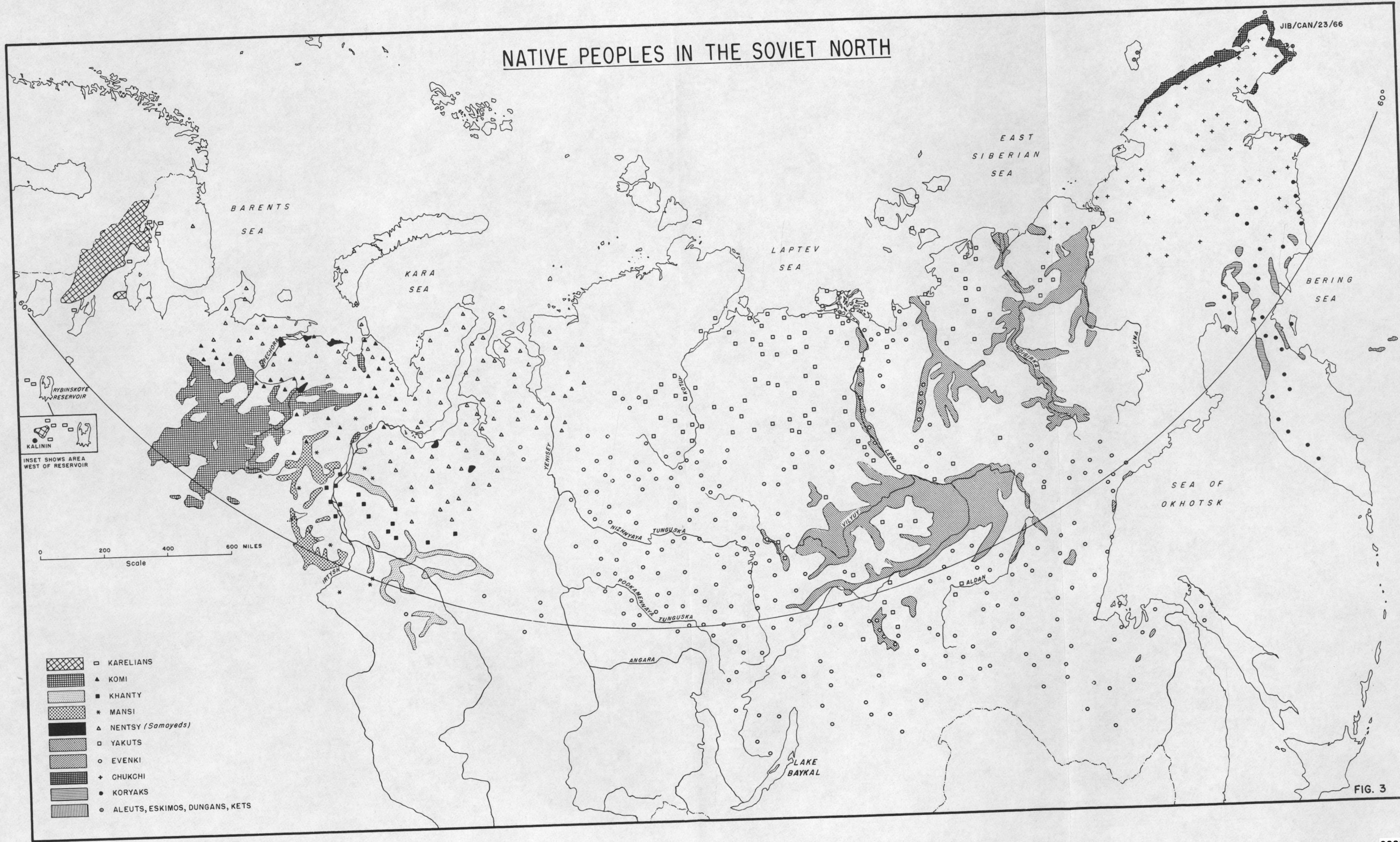


FIG. 2

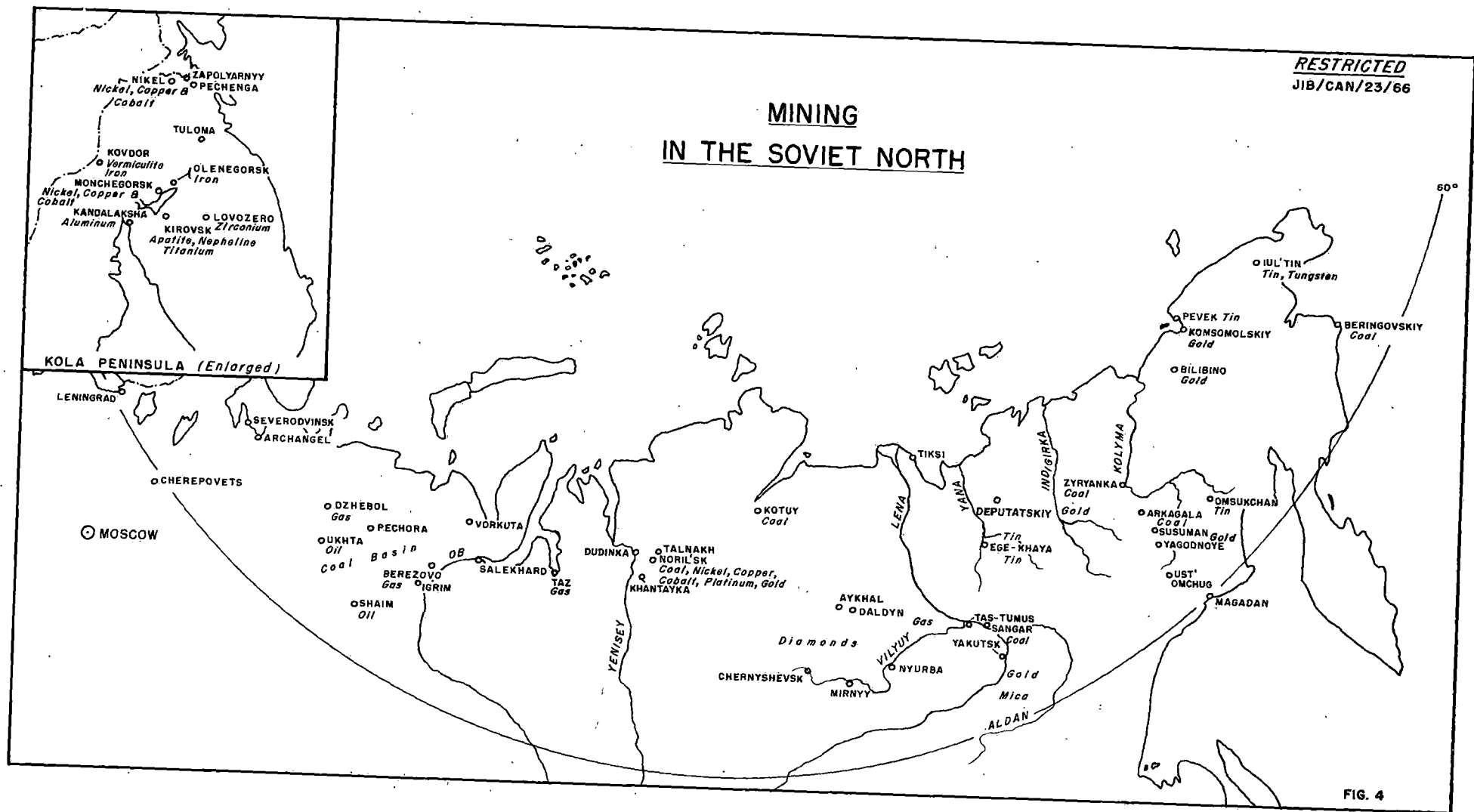
# NATIVE PEOPLES IN THE SOVIET NORTH

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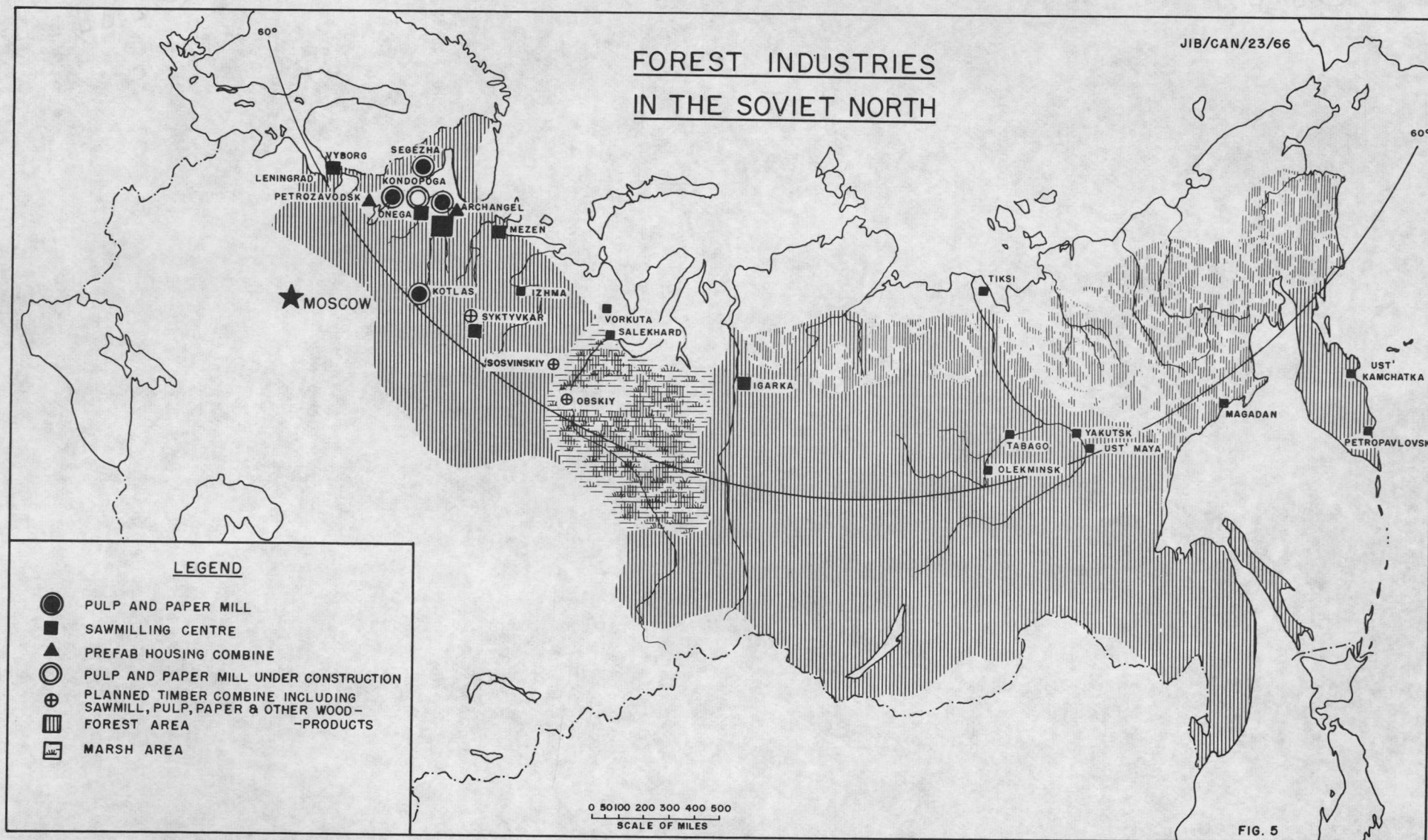


- KARELIANS
- ▲ KOMI
- KHANTY
- \* MANSI
- △ NENTSY (*Samoyeds*)
- YAKUTS
- EVENKI
- + CHUKCHI
- KORYAKS
- ALEUTS, ESKIMOS, DUNGANS, KETS

FIG. 3







# FISH INDUSTRY IN THE SOVIET NORTH

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--- FISH PROCESSING PLANTS

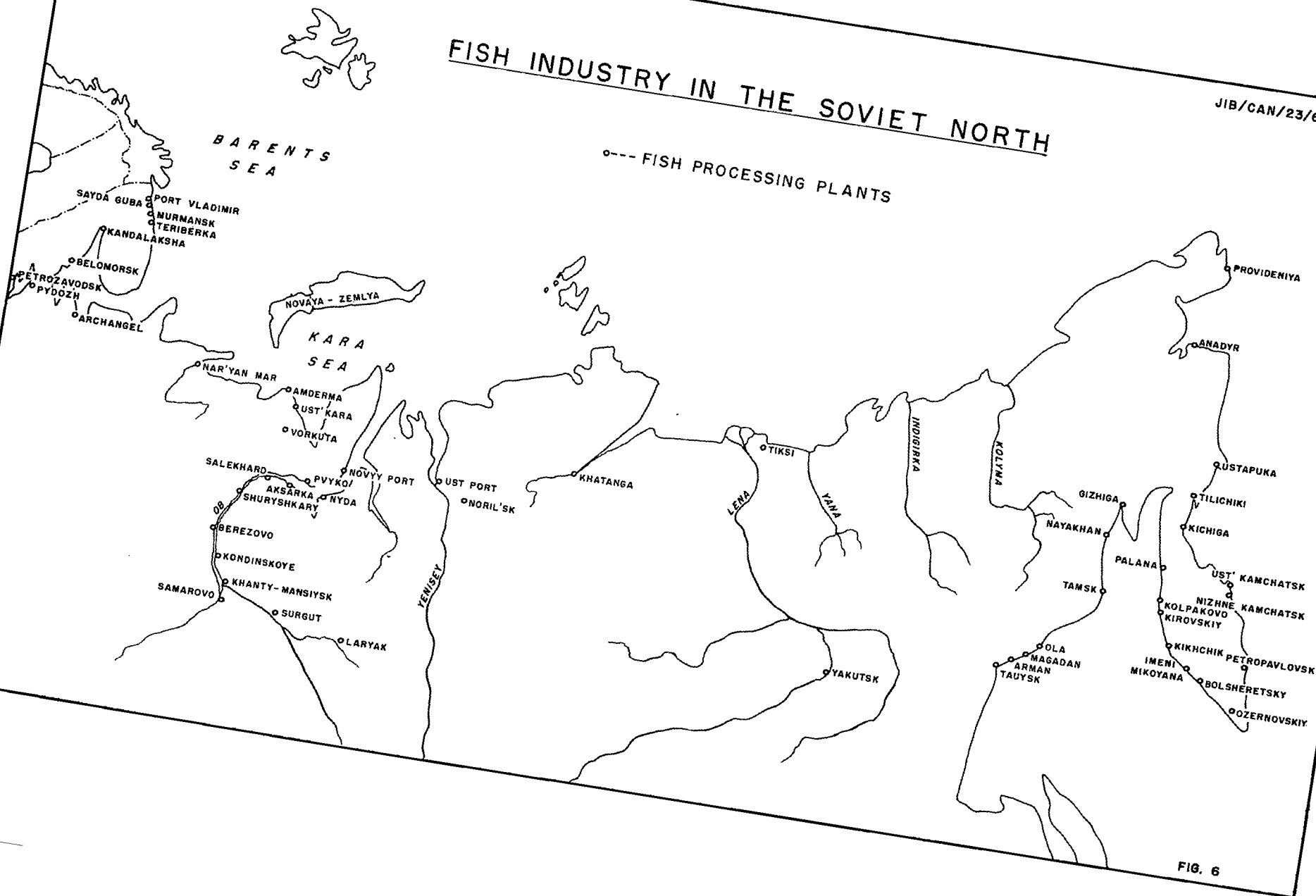


FIG. 6