

*Photo: Novosti Press Agency*

Mr. Arthur Laing, Minister for Northern Affairs and National Resources of Canada (centre), after visiting the underground permafrost laboratory in Yakutsk, U.S.S.R. Professor Pavel Melnikov, Director of the Yakutsk Permafrost Research Institute, is seen in the doorway.

## **PROFITABLE EXCHANGES AND CONTACTS BETWEEN U.S.S.R. AND CANADA**

**Lev Golubev\***

**T**HE SOVIET UNION AND CANADA are the largest countries in the world with a considerable part of their territory within the Arctic Circle or within a severe climate belt. Both countries have large areas with permafrost soils. In the U.S.S.R., permafrost covers 11,000,000 sq. km. or 48 per cent of the country's entire territory. The development of distant northern areas which abound in minerals is an important problem for both countries. This is why the exchange of delegations and a study of the experience accumulated in the Soviet Union and Canada in developing northern territories which took place in 1965 was of great importance.

### **Mr. Arthur Laing and his advisers in the U.S.S.R.**

The Soviet Union and Canada fairly regularly exchange various delegations. However, visits by Cabinet members of these countries are something rare. Arthur Laing, Minister for Northern Affairs and National Resources of Canada, was the second minister (following Mr. Lester Pearson, Canada's External Affairs Minister in 1955) to visit the U.S.S.R. during the past decade.

The delegation spent sixteen days in the Soviet Union at the end of May and the beginning of June. It included Deputy Minister Mr. Ernest Côté, Mr. John Turner, Mr. Laing's parliamentary secretary, Mr. Jack Austin, special assistant to the Minister, Mr. Graham Rowley and Mr. Harry Rosenberg, officials of the Ministry. In Moscow they were received by and had talks with executives of the State Building Committee of the U.S.S.R. Council of Ministers, which directs construction work throughout the country, including its northern district.

As Mr. Arthur Laing told me, the visit to the Arctic and Antarctic Institute in Leningrad was of great interest to the Canadians. Here the guests were informed as to the prospects of the Northern Sea Route which plays an important role in the industrial development of the Soviet North.

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\*Novosti Press Agency Staff Writer, U.S.S.R.

The Canadians learned that in the future Soviet specialists plan to use it both as a transit and an international route. Soviet researchers said that to solve this problem it was necessary to prevent ships from being held up in the Arctic waters. To achieve this, it is envisaged to commission diesel-electric ice-breakers and a new atomic ice-breaker.

Complying with the wishes of Mr. Laing and his party, stress was laid on their trip through the country on visits to remote districts in Eastern Siberia and in the northern part of the U.S.S.R. where, in their opinion, the climate and the tasks of developing the territories to a great degree approximate those of northern Canada. They visited Irkutsk, Bratsk, Yakutsk and Norilsk covering some 20,000 km. of Soviet territory by plane.

### **In Eastern Siberia**

In Irkutsk, an industrial centre 7,000 km. to the east of Moscow which has a population of more than 400,000, the Canadians visited the large Shelekhov aluminium plant, while in the young Siberian city of Bratsk (600 km. northeast of Irkutsk) which appeared on the map only several years ago, they saw the powerful hydro-power station which had been built on the Angara. Its designed capacity is 4,500,000 kw. The delegation viewed the dam which is 127 m. high and 5,140 m. in length and made the rounds of the station's machine room with its 16 turbine generators (each with a capacity of 225,000 kw). In the future, another four turbines are to be commissioned.

Aron Gindin, chief engineer of Bratskstroï (the regional building organization), informed the Canadians that in the spring of 1965 preparatory work started 300 km. down the Angara from Bratsk on a new hydro-power station project, the Ust-Ilim station, which will also have a capacity of 4,500,000 kw. It is planned that by 1972-1973, six electric power stations will be in operation on the Angara and in Eastern Siberia with a total capacity of 13,500,000 kw. They will generate annually up to 73,000 million kwh.

Mr. Laing and his party visited the pulp and paper mills under construction in the Bratsk district, the first section of which is to manufacture 200,000 tons of cord pulp in 1965.

The Canadian specialists were interested in how the manpower problem is being solved in the U.S.S.R., how the influx of builders is ensured in districts with a severe climate. Aron Gindin who had been working in Bratsk since 1957 informed them that the Soviet government in order to draw workers and specialists to Eastern Siberia and to northern districts has set up a system of privileges: the wages of workers and engineers, depending on the nature of difficulties encountered, are 20-40 and even 80 per cent higher than those in the central districts of the U.S.S.R. Besides this, they receive an additional 10 per cent increase for every year spent in the north, as well as a longer paid vacation. The Canadian specialists were favourably impressed by this system. Minister A. Laing called it a most reasonable one, worthy of attention.

Engineer Aron Grindin telling the Canadian guests about the construction of the Bratsk Hydro Power Station dam.



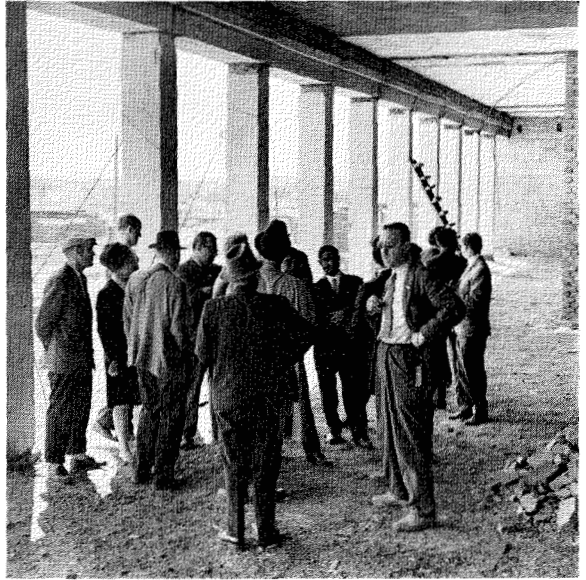
### In permafrost districts

"We are mostly interested in permafrost districts," Mr. Laing pointed out at the beginning of the trip. That is why more than half the time the delegation spent in the U.S.S.R. was in the Yakut Republic and in the Arctic city of Norilsk. The Yakut Autonomous Republic, which is incorporated in the Russian Federation, covers a territory of 3,100,000 sq. km. Permafrost soil is to be found everywhere in this republic. Its layers vary from several dozen metres to 1,600 metres. The Yakut Republic has a population of 500,000 — Yakuts, Russians, Evenks and Nenets. More than half of them live in cities and towns. The rural population is engaged in trapping, cattle breeding, fishing and vegetable growing. Gold, diamonds, tin, lead, coal and other minerals have been prospected and are being mined.

The city of Yakutsk, situated on the 62nd parallel, is the capital of the republic and has a population of about 100,000. The permafrost layer in the area of the city reaches 320 metres. During the winter which lasts eight months, the temperature at times drops to  $-65^{\circ}\text{C}$ .

In the city, the Canadian delegation was interested in the construction of multi-storey buildings. Today, stress is being laid in the northern districts of the U.S.S.R. on erecting mostly multi-storey buildings, as this to a considerable degree cuts expenditure on communications (water supply, electricity and sewerage) which are most expensive under permafrost conditions. It is planned to erect in the near future six-, seven- and nine-storey buildings in Yakutsk. At present, mainly four- and five-storey brick buildings are being erected. In Yakutsk and in other Soviet northern cities, houses are built on reinforced concrete piles, pile shoes, and are provided with a ventilated basement; this is to protect buildings from sinking as a result of permafrost soil thawing.

Four- and five-storey brick houses are built on permafrost ground in the town of Yakutsk, located on the 62nd parallel. Many of them, like the house shown in the photo, will have shops on the ground floor. Mr. Ernest Côté is seen in the foreground.



In Yakutsk, the Canadian specialists spent almost a whole day in the permafrost institute where its director, Professor Pavel Melnikov, acquainted the guests with the work conducted by the institute's 130 researchers. They study the heat exchange and thermo-physical properties of frozen soils, conditions for erecting houses and the construction of communications in permafrost, the conditions of subsoil waters in frozen soils.

In the Yakut Republic, the Canadians also visited a coal mine in a permafrost district, some 400 km. east of the city of Yakutsk.

Industrial Norilsk, situated on the 69th parallel, was the northernmost point visited by the Canadian delegation. Mr. Laing and his party made the round of the metallurgical combine which is a complex of several plants and large mines, saw the open-strip mining of ore and went down a number of mines. Here, valuable ores are extracted containing cobalt, palladium, platinum, nickel, iron, etc. Now the population of Norilsk is 125,000. A greater part of the people live in five-, six- and seven-storey brick houses.

Arthur Laing pointed out that Norilsk is quite a modern city, many buildings which could be an asset to the largest cities of the world as, for instance, the remarkable theatre, the erection of which was completed while the Canadians were on their visit to that city.

Before emplaning in Moscow for Ottawa, Mr. Arthur Laing said that the visit to the Soviet Union and the study of Siberia and the northern districts were most useful. As a result of everything he had seen in the Soviet Union, the Minister at that time pointed out, he was reinforced in his opinion as to the need of expanding co-operation between the two countries which, he said, should help each other in mastering the wealth of the north for the benefit of the people throughout the world.

### **A return visit of Soviet specialists**

A six-man delegation headed by Andrei Slivinsky, Vice-Chairman of the State Building Committee, spent seventeen days in Canada—from August 16 to September 3. Included in the delegation were Professor Pavel Melnikov from Yakutsk, engineer Konstantin Krupitsa from the Siberian city of Krasnoyarsk, engineer Boris Yermilov from Norilsk and Georgi Porkhayev and Mikhail Ivanov, researchers of the Moscow Institute of Foundations and Underground Construction.

The Soviet specialists started their study of Canada with Ottawa and also visited Montreal and Toronto. However, just as the Canadian delegation, during its visit to the U.S.S.R., the Soviet specialists were mostly interested in Canada's northern districts, in problems of house building, the erection of hydro-power stations and other projects under conditions of permafrost soil.

In all, the Soviet delegation visited seventeen cities including eight northern cities.

### **Impressions of head of delegation**

Andrei Slivinsky told me that the towns of Hay River, Inuvik, Yellowknife and Mayo built in permafrost areas were of the greatest interest to him and to other members of his group. There are no large cities such as Soviet Norilsk, Yakutsk and Magadan in northern Canada. In this respect we have amassed considerably greater experience in erecting factories and multi-storey buildings on permafrost soil, A. Slivinsky noted. "However, we were pleased with the Canadian experience in setting up small towns with a population of three to five thousand in the Far North (of the Hay River and Inuvik type)", A. Slivinsky continued. "We paid special attention to the light prefabricated constructions, the laying of sanitary and technical communications, the purification of domestic sewage, the organization of local gas and air heating and thermal insulation and hydro insulation of protection structures."

The head of the Soviet delegation also pointed out that he found the temporary housing projects for builders consisting of transportable houses which are used in the northern districts of Canada, quite good. Such transportable two-storey houses are being put out in large numbers by the Atco Company. The Canadian experience, according to A. Slivinsky, should be used in the U.S.S.R. in those cases where after construction work is completed only a small number of people are to remain in the given district for operating the project. Then the builders and their families could move together with the entire town to a new place.

According to A. Slivinsky, he also saw a most interesting experiment in building electric transmission lines in northern Canada, in areas which were hard to reach. These lines were on braced poles made from light aluminium alloys.

"We were also impressed by the excellent multi-storey garages build in Canada in the basements of large apartment houses and of public buildings. I am confident," A. Slivinsky remarked, "that our builders will study in detail this Canadian experience."

### **Excellent reception**

The head of the Soviet delegation noted that during the trip through Canada, the delegation was received cordially. "We are grateful to Minister A. Laing, his deputy Mr. E. Côté, his special assistant Mr. J. Austin and other Canadians who accompanied the delegation and did everything possible that our visit be useful and fruitful."

### **For future contacts**

A. Slivinsky further said that at present all the results of the visit of his delegation to Canada were being summed up. "We will strive to bring to the attention of the interested Soviet enterprises and organizations all that is valuable and acceptable for us and what we saw during our travels in Canada, our northern neighbours."

"During the concluding talk with Mr. Laing in Ottawa, he proposed further exchanges of specialists. Mr. Laing proposed that next year we exchange scientists who would study in detail the research conducted in the U.S.S.R. and Canada on permafrost soil, as well as exchanging building specialists. We," A. Slivinsky concluded, "are at present considering these proposals."

"I am confident that the exchange of specialists and of the experience accumulated in Canada and in the U.S.S.R. can result in great benefit for the peoples of both countries."