

THE FIRST SOVIET EXPEDITION TO ANTARCTICA.
WORK DURING THE INTERNATIONAL GEOPHYSICAL YEAR

The explorations of the south polar lands taking place in our time constitute one of the most intriguing pages in the history of the scientific conquest of the Earth.

D. I. Shcherbakov

In the southernmost latitudes, where in the first quarter of the 19th century a Russian expedition under F. F. Bellingshausen and M. P. Lazarev—the First Russian Antarctic Expedition, as it came to be called—discovered the sixth continent, Soviet scientists and specialists have carried out a broad programme of explorations and have made a number of outstanding discoveries. Explorations continue to this day.

Soviet explorations in Antarctica began with scientific observations by the Antarctic Whaling Flotilla *Slava*, carried out yearly for many years beginning with the 1946-1947 fishing season.

The scientific work was under the auspices of the All-Union Scientific Research Institute of Fishing and Oceanography. Personnel from the State Institute of Oceanography were also attached to the flotilla's team of scientists.

Besides the special studies directly connected with whaling (organisation of the industry, whale biology, the technology of processing and utilising the various kinds of whale raw material), the scientists made a general study of Antarctica, its fauna, climate, ocean water, ocean currents and ice conditions.

Weather observations consisted of measuring temperature and humidity, wind velocity and direction, etc. On the basis

of these observations, the State Institute of Oceanography published several books on antarctic weather conditions.

Extensive oceanographic research was carried out. Records were kept of the temperature, salinity, oxygen content, transparency and colour of the water. Temporal changes in temperature, salinity and oxygen content were measured at various depths up to 300 m (measurements at three-hour intervals). Deep water hydrological studies were also made, in which cores were taken for laboratory analysis and the water temperature measured to depths of up to 3,000 m.

A much more extensive research programme, embracing not only the ocean waters of Antarctica but the continent itself, was launched in 1956, in connection with the International Geophysical Year (IGY), which began July 1, 1957.*

In preparing for this great scientific undertaking, the international IGY committee** reviewed the general plans for the upcoming investigations and urged that as many countries as possible organise geophysical observations in Antarctica, since that remote and inaccessible region remained the least studied part of our planet. Soviet scientists and the Soviet government did not hesitate in responding to this call: in July 1955, the government of the USSR announced its decision to send a large expedition to Antarctica. Direction of the scientific work was assigned to the Academy of Sciences of the USSR, while the preparations and technical outfitting came under the Chief Northern Sea Route Administration, which had a great deal of experience in the exploration of the Arctic.

The USSR Academy of Sciences set up a special Council on Antarctic Explorations***, headed by Academician D. I. Shcherbakov, to carry out the scientific direction of the expedition. The council worked in close contact with the Chief Northern Sea Route Administration, which, with the co-operation of many scientific institutions and departments (the Chief Hydrometeorological Services Administration, the Ministry of Fishing and others) was organising and equipping the expedition.

* The *Slava* whaling flotilla also continued working in the antarctic waters after 1956.

** See footnote on page 55.

*** Now called the Interdepartmental Commission for the Study of Antarctica.

The expedition's programme included work along many lines: studying the influence of antarctic atmospheric processes on the overall circulation of the Earth's atmosphere; studying the basic movement patterns of antarctic waters and their connection with the overall water circulation of the World Ocean; studying the geological structure and history of the ocean floor in the antarctic region; studying the ice conditions of the antarctic waters; studying the waves in the south polar basin; studying the raw material basis of antarctic whaling; studying the zonal distribution of the fauna in the World Ocean; physiogeographic mapping and description of Antarctica; studying the glaciers of Antarctica and their dynamics; compiling a geological description and studying the geological history of the antarctic region; studying the peculiarities of the geophysical phenomena in Antarctica (the geomagnetic field, earth currents, conditions of the ionosphere and polar aurora, cosmic rays, seismic waves); studying the biogeographical characteristics of Antarctica; developing methods of aeronavigation in Antarctica; and drawing up the navigational and hydrographic characteristics of the regions through which the expedition sailed.

The IGY was planned as a period, to run from July 1, 1957 to December 31, 1958, during which a wide scope of scientific observations would be conducted according to a single plan that had been worked out and co-ordinated at a series of international conferences. However, the complexity of organising and conducting research in severe antarctic conditions required that work on establishing a scientific base on the continent be started ahead of time.

The plan was to set up three basic scientific stations on the continent and to conduct studies of the ocean and coastal waters from a specially equipped ship. One station, which would serve as the expedition's main base and observatory, was to be set up in a coastal strip facing the Indian Ocean that was virtually unexplored and was shown with a dotted line on the map. The other two stations had to be set up far inland, one in the region of the south geomagnetic pole, and the other in the region of the Pole of Inaccessibility (or, more precisely, the Pole of Relative Inaccessibility), that is, at a point far removed from the sea coasts and where man had never set foot before. The two remote points were to be reached from the main base.

The main task of the 1955-1957 Soviet Antarctic Expedition—or the First Soviet Antarctic Expedition, as it came to be called—was to build the main base and a geophysical observatory. In addition to this, it was to make several geographical examinations of the regions in which work was to be conducted, organise a short programme of stationary observations at the coastal observatory, and conduct oceanographic work in the antarctic waters.

The expedition was given three ships: the *Ob* and the *Lena*, diesel-electric ships, each with a displacement of 12,600 tons and a carrying capacity of 4,500 tons, and the *Refrigerator No. 7*, with a 2,200 tons displacement, designed to carry perishables.

The First Soviet Antarctic Expedition was placed under the command of M. M. Somov, a noted polar explorer who had headed the North Pole 2 scientific drifting station in 1950-1951. The expedition's personnel included scientists in varied fields, the ships' crews, airplane pilots, technicians and building workers. All in all, about 350 men took part.

The expedition was broken down into two big sections or groups—a land group and an ocean group—each an independent expedition to a certain extent. The land section was made up of four units: aerometeorological, geophysical, geographical-geological and air photography. The ocean section had seven units: hydrological, hydrographical, marine geological, hydrochemical, hydrobiological, geophysical and aerometeorological. These units comprised the First Antarctic Marine Expedition, headed by oceanologist V. G. Kort, who was at that time director of the Institute of Oceanology of the USSR Academy of Sciences. The marine expedition was later given the diesel-electric ship, *Ob*, which had been



M. M. Somov

especially outfitted to conduct oceanographic studies and became the largest research ship of its type.

The *Ob* set out for Antarctica from Kaliningrad on November 30, 1955. On board was the first group of participants in the Soviet Antarctic Expedition, namely, the leadership of the expedition, a large part of its scientific personnel and the building crew that was to build the future settlement of the coastal base. Two weeks later, the remaining members of the expedition departed for Antarctica aboard the *Lena*.

In early January 1956, the *Ob* approached the shores of Antarctica and entered Depot Bay (Davis Sea) in the region of Queen Mary Land. After lengthy air reconnaissance, a piece of ice free land was spotted west of Depot Bay and south of Haswell Island, along a strip of coastline called Pravda Coast. On January 14, the *Ob* came up as far as the fast ice at the contemplated disembarkation point and stopped 100 m from shore. Unloading was a very complicated procedure.

The *Lena* arrived at Pravda Coast on January 20, and the *Refrigerator No. 7.*, on February 8, 1956.

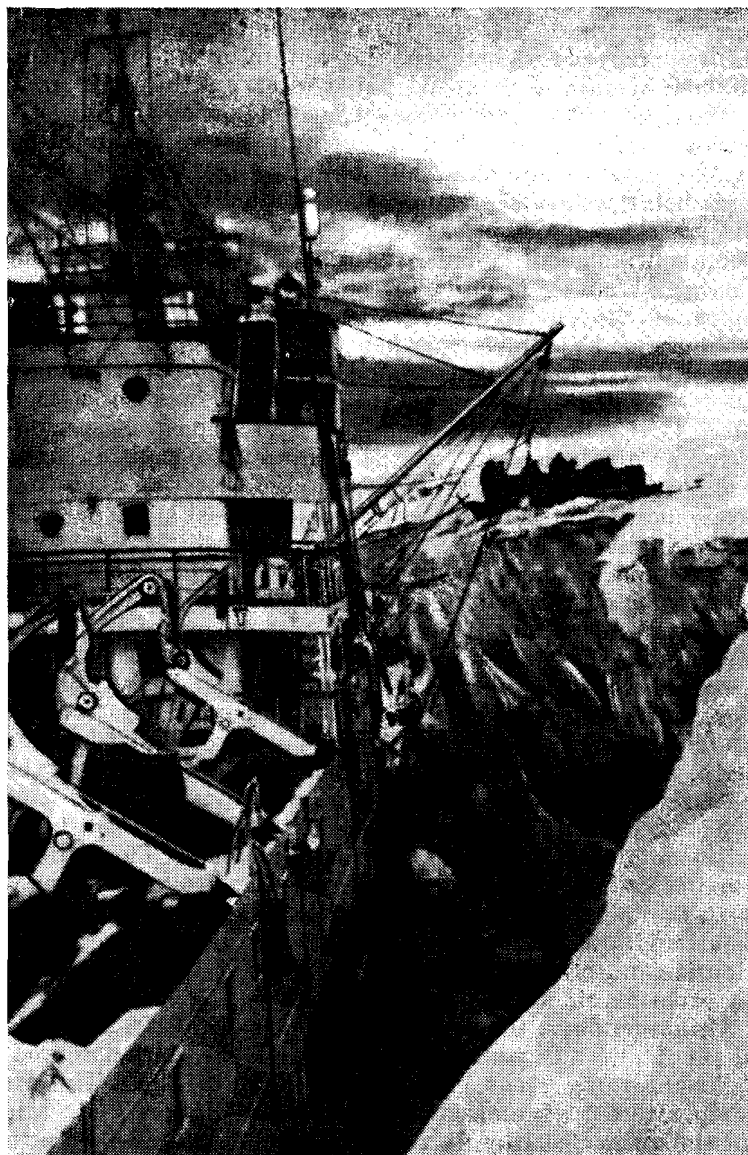
Scientific reconnoitring and construction of the coastal base settlement began immediately. Houses for living quarters, scientific studios, receiving and transmitting radio stations, an electric power station and other structures were assembled out of prefabricated panels. The construction crew, with the help of the entire expedition staff, completed construction of the settlement in the course of the antarctic summer of 1955-1956.

The ceremonies marking the opening of the observatory and settlement took place on February 13. On that bright, sunny day, the red flag was hoisted at 66°33'S and 93°E. The observatory and settlement were officially called Mirny, in honour of one of the ships of the First Russian Antarctic Expedition under F. F. Bellingshausen and M. P. Lazarev.

From that day on, regular aerometeorological, geophysical and glacial observations were conducted, and as time went on, the scope of research, especially the geophysical work, was broadened.

Most of the houses and other buildings were built along one main street, which was called Lenin Street. Nearer to the sea, some small buildings were erected here and there on the rocks along the shore.

Once the village was built, the *Lena* took the construction crew back home to the Soviet Union, the *Refrigerator*



The First Soviet Antarctic Expedition. Unloading the *Lena*

No. 7 headed out to sea where the *Slava* whaling flotilla was working, and the *Ob* marine expedition began to carry out its research programme in the antarctic waters. About 90 men remained to spend the winter on the mainland.

Members of the expedition began their scientific investigations immediately, that is, not only before the building of Mirny was completed, but from the moment the ships were being unloaded. At first they studied the coast in the disembarkation region, as well as Haswell Island and its neighbouring small islands. It turned out that the coast and the islands were ten miles further north than shown on the maps of the British Admiralty.

At the end of January, when the unloading of the ships was in full swing, scientists and flyers explored the Banger Oasis, located 360 km east of Mirny. It was so named after D. E. Banger, an American flyer under whose command an airplane of an American antarctic expedition made a flight over the antarctic coast in 1947. It was then that flyers first saw along the edge of the Shackleton Glacier "a land of blue and green lakes and brown hills".

A 13-man team, flown in two airplanes and a helicopter, flew to the oasis, spent six days studying that unique place where an area of about 500 sq km was devoid of ice cover. Among the first Soviet scientists to visit the oasis were geographers G. A. Avsyuk, K. K. Markov and P. A. Shumsky and geologist O. S. Vyalov. A temporary base was set up on the nearby glacier, and from this take-off and landing strip, the helicopter took the explorers to the centre of the oasis.

The surface of the oasis is rocky, with numerous hills, with moraine-filled depressions between them. The hollows abound in lakes. Some are wide and deep fresh-water lakes with drainage, giving off a blue colour, and there are many small undrained salt-water lakes in which the salt accumulation is connected with chemical changes in the rocks caused by atmospheric agents and solar heat.

On sunny days, the temperature of the air at the oasis was about 1° to 3°C while the surface of the dark-coloured, light-absorbing rocks got as hot as 25° to 30°C. The air temperature in the oasis at times rose as high as 7°C, while on the glacier nearby it was -5°C. The oasis had its own microclimate, with summer temperatures considerably higher than in the ice regions surrounding it.

Markov noted that the landscape of this antarctic oasis resembled the cold deserts of the Eastern Pamirs. It has also been compared with the cold deserts of the high Tien Shan watershed regions (*syrts*), however, it is more desolate and incomparably more lifeless. It is a really cold rocky desert where the air is exceptionally dry, the relative humidity averaging only 50 per cent. The word "oasis" is applied to such localities in Antarctica in a highly conditional and relative sense; it is a lifeless desert oasis in the midst of an even more lifeless and colder desert of ice.

The oasis is more dreary and silent than the rocky area around the Mirny settlement where there are penguins to liven up the scene. But one can see snow petrels and skuas in the clefts of the rocks. The rocks are covered with lichen and mosses.

While Banger Oasis is but one of many oases in the coastal zones of Antarctica, it is one of the largest.*

The expedition soon began making air reconnaissance flights to the interior regions of the continent. Taking advantage of the clear weather, flyer I. I. Cherevichny took expedition commander Somov and other members of the expedition on a flight in an IL-14 aircraft over the geomagnetic pole and the region where the Vostok station was to be set up. It was determined during this and subsequent flights that the area between the Mirny observatory and the future Vostok station was a high and relatively level ice plateau.

On a clear day in the beginning of March, the same party flew in the direction of the Pole of Relative Inaccessibility as far as 76°S and 79°E. The nature of the ice sheet there was the same; there was no sign of the mountain chains that were shown on some American maps as lying between Mirny and where the future station, Sovetskaya, was to be set up 300 km from the coast.

A few days later, a light AN-2 ski-plane flew a distance of 400 km from Mirny and landed on the ice sheet at an elevation of 3,000 m. Upon landing, the party, headed by A. M. Gusev (or more exactly, Gusev and the flyers), set up a semi-spherical tent of the same kind that was used in the North Pole drifting stations in the Arctic. With the help of the flyers, Gusev conducted continuous observations for

* Another large oasis is the South Victoria Land Oasis.



Landing strip at Mirny

a period of five days. They found a remarkably big difference between the temperature of the air there on the ice sheet and the temperature prevailing at Mirny. At Mirny, the temperature was -5°C , while at the landing point it was -45° to -50°C . The cold, the constant ground wind and the rarified air made living and working there extremely difficult. The men got an idea of the conditions that the workers of the future interior stations would have to cope with.

In the beginning of April 1956, a tractor-and-sledge train carrying a party headed by Somov left Mirny for the deep interior of the continent. A. M. Gusev, a member of that party, wrote: "I will long remember the picture: it was night. The wind was roaring over the icy desert, blowing up a solid wall of snow. The vague contours of the tractor and the heavy sledges could barely be seen through the whirlwinds of snow. Two dim spots of light from the headlamps moved through the dark of night. You could hear the laboured roar of the motors, and in front of the tractor in the weak beam of the headlights you could see two human

figures holding ice picks; they were bending forward against the wind and doggedly stepping into the unknown" [115].

The train perforce moved very slowly. First it ran into a steep upgrade and loose snow, then high rugged sastrugi and a blizzard. When the train stopped for a day or two, the tractor and sledge got covered with snow, which the men had to clear away before they could move on.

Despite the harsh conditions, the members of the party conducted scientific studies of the region during the short stopovers. They systematically took meteorological observations, measured the Earth's magnetism and studied the snow cover. At a number of points, using seismic methods, they measured the thickness of the ice. It was over two kilometres thick, and in places the underlying rock lay below sea level.

According to the original plan, the train was supposed to travel a distance of 400 km; however, at the half-way point, it was already clear that there would not be enough fuel to make it that far and back to Mirny. So it was decided not to return but to go south for as far as possible and convert the train into an interior scientific station.

Twenty days after the trip began, when the train had traversed 215 km, two airplanes arrived from Mirny. Somov returned to Mirny on one of them, and Gusev took charge of the party for the remaining distance.

The train proceeded southward slowly. It was now May, already a winter month, and the temperature dropped to between -50° and -60°C . The days were getting shorter as the polar night approached.

By May 4, the train had reached a point 375 km from Mirny, and it was decided to set up the station right there. That day, an AN-2 aircraft delivered provisions, building materials, and a carpenter. It took till the end of May to build the station and set up its equipment. The official opening took place on May 27, 1956. This, the first station in the interior of Antarctica, was named Pionerskaya.

A meteorological platform and a snow-measuring platform were set up at the station; a 16-metre long hole was bored in the ice to study the upper layer of the continent's coat of ice; and instruments were set up for various kinds of observations.

After May 25, the sun no longer rose above the horizon. The polar night had begun and would last till July 20. The

darkness and continual bad weather made flights with supplies for the station nigh on impossible. The last plane to make it through (June 7) brought a radio-operator and a glaciologist and took back to Mirny part of the tractor-sledge train party. Remaining at the station for the winter were A. M. Gusev who was in charge of the station and was himself a meteorologist; geographer and glaciologist L. D. Dolgushin; a radio-technician and a tractor driver. The winter party was cut off from the outside world for almost six months; the only communication with it was by radio.

The members of the winter party underwent many harsh ordeals during the polar night. Gusev registered a temperature low of -66.7°C on August 20. There were strong winds and snow-storms and the men could feel the oxygen deficiency in the rarified atmosphere at the high absolute elevation.

On November 17, 1956, a new party was flown from Mirny to relieve Gusev's group. The latter in turn was flown back to Mirny on the same plane.

Living conditions had changed considerably in the winter. A strong wind from the interior to the coast blew almost incessantly from the beginning of April on. The houses and other structures were soon buried in snow. The only way to get out was through holes in the roofs.

To study the drainage winds blowing from the interior of the ice-covered continent, four temporary observation stations were set up in the coastal zone. The observers had to live there in tents in the worst weather (August).

In September 1956, that is, at the end of winter, the party based in Mirny started in on the job of setting up a small permanent station in the centre of the Banger Oasis. Tents, building materials, a small tractor, a radio station, scientific equipment, fuel (gas) and provisions were flown to the oasis. Two light-weight prefabricated houses were rapidly assembled, and rocks were piled almost half way up the side exposed to the wind. Oasis, the third Soviet station in Antarctica, was ready for operations on October 15, 1956.

In the summer season of 1956-1957, the geological and geographical unit of the First Soviet Antarctic Expedition made an extensive exploration of the coastal zone. The glaciologists in this unit made several flights to the islands, the Shackleton Ice Shelf and floating icebergs. Wherever

they landed they conducted glaciological, gravimetric and seismic sounding observations.

The First Antarctic Marine Expedition began its independent work on the last day of February and continued until July 1956.

On February 29, the *Ob* set out from Pravda Coast on an oceanographic voyage. It carried a total of 115 men—48 scientific workers and 67 members of the ship's crew.

The expedition made an oceanographic survey of the Davis Sea and conducted interesting observations of its organic life. The ship sailed through waters where the depths were virtually unknown. After the expedition returned home, a new sea navigation chart of the Davis Sea was drawn up and published. This expedition discovered and probed an underwater trench with depths of up to 1,440 m stretching parallel to the coastline. Subsequent Soviet oceanographic explorations traced the trench for a long distance along the antarctic coast and found that in some places it passed under the ice shelves. Later, this trench, lying within the antarctic continental shelf, was named after M. P. Lazarev.

Sailing among the ice floes and icebergs was difficult since autumn was approaching (it was March, which in the southern hemisphere corresponds to September in the northern hemisphere); there was dense fog, snow and wind. Nonetheless, the ship made systematic stops to conduct hydrological, geological and biological observations. The water at all levels and the ocean floor itself were studied.

The expedition determined that the Shackleton Ice Shelf was considerably smaller than shown on former maps. Moving east along the antarctic coast, the expedition also discovered several theretofore unknown islands, charted the coastline more precisely and carried out comprehensive oceanographic observations.

Refinements by means of depth soundings were made in the relief map of the ocean bottom, and in some cases the surface contours shown on previous maps had to be changed considerably. For example, when the *Ob* sailed among a huge accumulation of icebergs near the Banzare Coast, it made a depth sounding in a place where the latest maps showed land.

On March 27, the *Ob* reached the Balleny Islands, the easternmost point of its first voyage along the antarctic



A. F. Treshnikov

coast, where it conducted extensive explorations of the waters and the ocean floor between 91° and 162° E.

On July 5, the *Ob* arrived in Leningrad, having conducted on the way back another series of studies in the antarctic waters and the Indian Ocean.

In November 1956, the *Ob* sailed once again from Kalinin-grad to Antarctica. On board was the first party of the second staff of the Soviet Antarctic Expedition, that is, part of the staff of the Second Expedition which was to relieve the winterers of the First Expedition. The Second Expedition was headed by A. F. Treshnikov, a noted polar explorer who had directed the work on the North Pole 3 drifting station in the Central Arctic.

The basic task of the Second Expedition (1956-1958) was to set up the Vostok and Sovetskaya stations in the interior

of the continent and to begin full-scale scientific observations at the already existing and newly set-up stations in accordance with the IGY programme. However, setting up the new stations proved to be such an exceptionally complicated and difficult job that the Second Expedition was not able to carry it out completely.

The *Ob* arrived at Mirny station on December 12, 1956, with the first part of the Second Expedition, which included photographers, geologists, biologists, flyers, radio-operators and a large construction crew. The contemplated aerial photography and geological and biological studies depended greatly on the summer season, which was already at its height in Antarctica. Consequently, no time was wasted in unloading and getting down to work. Even while the *Ob* was still breaking its way through the fast ice, the construction crew was flown ashore by the helicopter so that it would start the job of expanding the Mirny settlement and observatory.

By January 5, 1957, the *Ob* was unloaded and shortly thereafter, the motor ship *Kooperatsia*, arrived with the rest of the scientific staff of the Second Expedition.

On January 14, the members of the marine expedition, who, together with the ship's crew had taken an active part in the work of unloading the ship and putting up the new buildings in Mirny, set sail on the *Ob* to conduct their oceanographic studies.

The expedition's third ship, the *Lena*, dropped anchor in the Mirny road on January 22. Unloading operations proceeded with exceptionally great complications, and in the beginning of February there was a catastrophe: a huge piece of the ice barrier to which the ship was tied crashed into the sea. Nine men, who were on the barrier receiving the cargo, were plunged into the water along with the great mass of snow and névé. Seven men were saved, but the other two were already dead when they were pulled out of the water.

On February 15, 1957, the *Kooperatsia* and the *Lena* left the Mirny road. The *Kooperatsia* took the members of the previous expedition back home, while the *Lena*, with aerial photography, hydrographic, aviation and hydrometeorological units on board, headed west to study and take aerial photographs of the antarctic coastline.

The Second Expedition did a considerably wider range of work in aerial photography and establishing astronomical points than its predecessors.

Field work began as soon as the ships tied up at Mirny, even while unloading was still in progress. At the end of December 1956, a party of geologists, headed by Professor M. G. Ravich, arrived at Oasis Station. From there, the explorers flew by helicopter to all the places where bedrock was exposed, including the rocky capes on the eastern edge of the oasis. A geological survey in the Banger Oasis area was made at the end of February 1957.

Forty kilometres south-west of the oasis there is a group of hills which were named the Obruchev Hills, and 15 km north-west of the oasis is another group of hills, named the Maly Oasis. This region was also explored.

In January 1957, geologists were flown 150 km into the interior of the continent to the Amundsen and Sandau mountains, and also 400 km south-west of Mirny to Mount Brown, where they gathered data on Antarctica's ancient crystalline rocks.

After two test trips, a glaciological research train trip was organised to go from Mirny to Pionerskaya to study the thickness of the glaciers and the properties of its snow and névé mantle. The operation was headed by P. A. Shumsky. The data gathered during the trip had to do with the thickness of the ice. The greatest thickness encountered was 2,360 m, while the average was 1,500 to 1,600 m.

Between the coast and a point 200 km inland, the bedrock under the glacier was found to be considerably below sea level in places. Beyond the 200th kilometre, a mountain range, under the ice, with elevations of up to 730 m was probed. Deep valleys cutting through the range sank to sea level and even lower. Thus, Soviet explorers in East Antarctica were the first to definitely establish the fact that the edge of the vast continent has sunk there under the weight of the ice sheet and that the low points of its real relief lie below sea level. If the ice were to melt, the continent would rise, and the distance of the so-called isostatic lift would range between 0.5 to 1 km (an average of 800 m). "East Antarctica is not a group of islands, but a continent that has sunk down under the weight of its glacial cover" [116].

In February, a train consisting of three tractors and six sledges in tandem, left Mirny to set up Komsomolskaya

Station in the interior of the continent. This station was not in the original plan, but after it was learned just how difficult work and movement in the interior was and what tremendous difficulties the 1,500 km trip to the south geomagnetic pole would pose, it was decided to set up an intermediate auxiliary station 850 km from Mirny. After passing Pionerskaya, where it had stopped for a week to repair the sledges that were damaged in traversing the rugged country, the train headed further south. Movement was now hampered by the snow cover, which consisted of tiny ice crystals resembling dry sand.

The tractors whirled in place, while the runners on the sledges did not slide easily. The temperature had dropped to -60°C .

On March 7, 1957, the train arrived at the point where Komsomolskaya Station was to be set up ($74^{\circ}05'\text{S}$, $97^{\circ}29'\text{E}$). The temperature at night here was as low as -69°C . The skis on the planes that flew in from Mirny would not slide, making landings and take-offs extremely difficult.

The idea of wintering at Komsomolskaya that season had to be abandoned. It would have required many flights to deliver everything needed for a winter stay, but that was out of the question because hurricane winds were blowing in Mirny and the planes were grounded. There was just enough flying weather left to fly the men who had gone by train back to Mirny. The three tractors and the sledges with cabins on them had to be left till spring.

The reasons for the failure in organising the winter set-up at Komsomolskaya were the late arrival of the ships that brought the Second Expedition to Antarctica, the prolonged and difficult unloading operations, and the consequent late departure from Mirny of the sledge train.

In late February, another train left Mirny, this one even bigger than the one that had gone two weeks earlier to set up Komsomolskaya Station. This one consisted of five tractors and ten sledges. Its objective was to set up Vostok Station at the south geomagnetic pole. However, it reached that point only nine months later, in December. On the way, during a stopover at Pionerskaya, it was decided that the train should stop at some intermediate point where a temporary winter station would be set up. Such a station was established on March 18, 1957 640 km from Mirny (at $72^{\circ}08'\text{S}$ and $96^{\circ}35'\text{E}$).

"We dubbed it Vostok-1," writes A. F. Treshnikov. "By so calling it, we wanted to underscore the fact that we had not abandoned the attempt to organise the Vostok Station in the region of the south geomagnetic pole, and that Vostok-1 was but the first step towards this end" [117].

In the meantime, hurricane winds were raging over the coast. On March 21, a hurricane with winds over 40 m per second burst over Oasis Station. The aerological platform, which was built out of thick squared beams and plywood panels, was wrecked and carried away part by part, and the bamboo radio tower was destroyed. There were violent hurricanes in April as well. In Mirny, there were winds of up to 30 m per second, while at Oasis Station they exceeded 50 m per second, breaking the radio tower again and tearing and carrying away a tent.

A furious hurricane hit Mirny in mid-August, with gusts of over 45 m per second and, at its height, of over 50 m per second. People going out-of-doors when the hurricane first started were knocked down and received injuries. Later, it was absolutely impossible to go outside. Boards, pieces of plywood, empty crates and barrels were flying by at a tremendous speed no less than two metres above the surface of the snow. There was much damage in the settlement, while at the airfield two airplanes were torn from their ties and damaged.

The men who went with the trains to the interior and those already manning existing stations were not the only ones whose work was complicated, difficult and dangerous. There was danger lurking even in Mirny and the area immediately around it. For example, there were large clefts in the ice around Mirny that were concealed from view by a layer of snow, so there was always the danger of someone falling through the snow into them. This actually happened to A. F. Treshnikov, the head of the Second Soviet Antarctic Expedition. "He fell into a gap in the ice one day while examining a coastal precipice in search of a suitable place for future unloading of ships. Georgi Matveichuk was standing right next to him when suddenly at the spot where the impressive figure of his chief was standing a moment before there was only a gaping hole about half a metre in diameter. Treshnikov was hanging by his elbows just above the water that filled the crack. It was sea water, such as penetrates into

such cracks near the shore. But for someone falling into it, was no better than any other kind of water.

"Help came immediately, but when Treshnikov was pulled out of the cleft, it was found that he had dislocated his arm in the fall. Bearing the pain, he had held himself on his injured arm and, thanks to his endurance, saved his own life. Everybody went on the double to the medical unit. On the way, however, Treshnikov slipped, fell—and set his arm back into joint! The doctor had only to apply a compress" [118].

Plane landings and take-offs were also dangerous. In early January 1958, for example, in taking off for a return flight from Mount Brown, an aircraft carrying a party headed by P. A. Shumsky "got one of its skis snagged on the sastrugi, causing the plane to crash. The motors and wings were knocked off. Fortunately, the men were not injured. They say this rarely happens..." [119].

On October 8, 1957, a sledge train with six tractors started out from Mirny into the interior. On October 16, it arrived at Pionerskaya; on October 29, it reached Vostok-1 Station; and on November 4, it came to the place where the Komsomolskaya Station train had been left. On November 6, Komsomolskaya Station began to function. Aerometeological observations were organised and a landing strip cleared.

Back in March 1957, a minimum thermometer had been mounted on one of the sledges that was left when the men were evacuated. It showed that during the winter the temperature had reached -74.5°C .

Once Komsomolskaya Station was set up and four men left there to operate it, the temporary Vostok-1 Station, which had operated for eight and a half months, was dismantled. All of its equipment was brought to the region of the south geomagnetic pole, where, on December 16, 1957, Vostok Station was officially opened. Located 1,410 km from Mirny, at an elevation of 3,490 m, Vostok became the second (after Mirny) Soviet observatory in Antarctica. It was named in honour of the Bellingshausen-Lazarev expedition's ship, the *Vostok*.

Treshnikov himself took command of the tractor and sledge train that went from Komsomolskaya to the south geomagnetic pole. "The trip into the interior of the continent was difficult and dangerous," he wrote later. "The constant head