

In the Kingdom of Snowstorms and Winds

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The legend about the Southern Continent has excited man's imagination since long. Brave explorers spent many years in searching for this land. But it was only on 28 January 1820 that the Russian navigators headed by F. F. Bellingshausen and M.P. Lazarev managed to reach the shores of the harsh Antarctic and then sail around this continent. Since then scientists of many countries have been studying the Sixth Continent.

However, till recently very little was known about the nature of this icebound silent land. It is, therefore, not surprising that the Special IGY Committee proclaimed the Antarctic to be the most important part of the globe for intensive research during the IGY.

In 1955 the combined Soviet Antarctic expedition was organized to conduct comprehensive explorations on the continent and the seas that surround it.

The international programme of Antarctic explorations is being fulfilled by the combined efforts of scientists of many countries. Today many secrets of this harsh continent have already been disclosed.

The assignment of the Soviet expedition, according to the international agreement, was the least studied and the harshest parts of the Antarctic continent. It will be recalled that it was about this part of the land that the well-known Australian scientist D. Mouson, who had been to the Antarctic several times, wrote that it was a kingdom of snowstorms and winds, an empty world of fury and horror.

On 13 February 1956, the Soviet polar explorers raised their country's flag above the settlement which they themselves had just built. Under the flagpole bearing the State banner of the USSR they placed some earth brought from the heroic city of Stalingrad.

Within a comparatively short period the Soviet expedition accomplished a tremendous amount of work. Soviet explorers enriched world science with many valuable discoveries which have made it possible to disclose some of the secrets of the icebound continent. Their work was highly appreciated at the last assembly of the Special IGY Committee.

The Antarctic Continent is almost completely covered with ice. A study of this phenomenon is one of the most interesting problems of science. Its solution will throw light on the nature of the ice cover, its physical properties, the evolution of the Antarctic continent and its influence upon the circulation of the masses of air and water throughout the world. From the very first days of their work in the Antarctic, Soviet scientists began to tackle this great problem.

Immediately after the main building work was completed in Mirny, Soviet explorers began to study the inner districts of the continent. It should be mentioned that Soviet research workers were the first to employ the sledge tractor-trains for this purpose. With their help the explorers overcame the extremely difficult natural conditions and created the research stations Pionerskaya, Vostok-1, Komsomolskaya, Vostok and

Sov'yetskaya in the inner part of the continent.

On 14 December last year, Soviet explorers created a station in the region of the Pole of inaccessibility in the most distant part away from the coast. Thus the last pole of our planet—the Pole of Relative Inaccessibility—has been finally attacked.

The observations of Soviet scientists have supplied valuable data concerning the thickness of the ice cover of the Antarctic. It was found that about two hundred kilometres to the south of Mirny, ice displaced a shallow sea with islands on one of which Mirny is located. The thickness of the ice at a distance of 375 km from Pravda Coast reaches 3500 metres.

However, scientists have not found as yet an answer to the question whether the Antarctic is a continent or an archipelago. One thing is obvious, namely, that if the continent does exist, its size and outlines differ considerably from the size of the ice cover. For the final solution of this problem new explorations must be undertaken; the Antarctic has to be crossed in many places and the thickness of ice assessed at various sections. However, on the basis of researches by USSR and other countries it may be said that the stock of ice in the Antarctic is considerably greater than it was considered to be till recently. It was calculated that if all the Antarctic ice were to melt, the level of the World Ocean would rise by about 45 metres.

It is very interesting to know what is happening today to the ice cover of the Sixth Continent—whether it is increasing or decreasing. Preliminary data show that in the last 50-60 years the thickness of the ice on the surface has been reduced by about 8 metres.

In some places along the coast Soviet scientists found the remains of woody plants and the imprints of leaves. That means that millions of years ago the Antarctic was a warm land with luxuriant vegetation.

Its huge masses of ice and low temperatures have transformed the Antarctic into an immense refrigerator of our planet. It exerts a great influence on the climate not only of the Southern Hemisphere but on that of the earth as a whole. This region is the kingdom of perpetual frost. As is known, on 25 August 1958, the temperature at Vostok station dropped to 87.4°C below zero.

Because of the great frosts anticyclone circulation reigns above the ice plateau of the Antarctic. Due to the force of gravity cold masses of air constantly flow to the sea and create the south and southeast winds in the Antarctic. Near the coast they often cause storms and sometimes hurricanes. Our polar explorers witnessed hurricanes which whirled barrels weighing upto 300 kilograms.

Extremely valuable data concerning the state of the atmosphere above the Antarctic have been obtained by radiosounding and special aerological expeditions. For instance it has been established that a thin layer of very cold air about 300-600 metres thick is formed above the ice. The temperature of its upper boundary is by 25-30 degrees higher than that of its lower boundary.

Till recently many scientists held that the atmosphere of the Sixth Continent is isolated, so to say, from the general circulation of the earth's air masses by "wind barriers" arising between 40° and 60° latitude south. However, an analysis of the numerous synoptic maps drawn at Mirny has proved that there are no insurmountable barriers for the warmer masses of air.

Of great scientific interest is the explanation of the origin of the icefree sections, the peculiar "oases" of the Antarctic. Specialists from other countries proposed various explanations concerning their origin. For instance, the outstanding American explorer of the Antarctic, Beard, believed that they arose due to some kind of underground source of heat.

One of these oases lies 360 kilometres to the east of Mirny. Soviet scientists immediately began exhaustive studies of the icefree area. On 15 October 1956 a permanent station called the "Oasis" was created here.

Prolonged studies have shown that the temperature of the air at the Oasis in summer is considerably higher than in Mirny. The average velocity of the wind is also lower there. In summer the rocks get even hot. As a result of this rise in temperature this locality has an air circulation of its own. The specific features of the relief of the Oasis makes the glaciers bypass it. The researches of Soviet scientists have thus cogently proved that the existence of this region is due to the combination of the specific features of its relief and climate.

Aircraft plays an important role in the study of the Antarctic. Soviet pilots have explored a huge area of the icebound continent. With their help land parties of scientists were able to explore all the length of the coast between 77° and 111° longitude east. Aerial photography and partly aerial magnetic surveying have been accomplished on almost the entire section of the coast. The whole section within the triangle, Mirny—geomagnetic pole—Inaccessible Pole, has been studied from the air.

Mention should also be made of an outstanding event in the history of Antarctic explorations—the flight of the crew headed by V. M. Perov on a wheel plane "IL-12" along the route, Mirny—South Geographic Pole—the American base MacMurdy-Mirny. During the trans-Antarctic flight covering a distance of 6500 km the brave crew flew for more than 4000 km above the icy desert without landing.

As a result of the numerous air expeditions of Soviet explorers in the Antarctic the first detailed map was drawn of the heights of a large area of the icebound continent. During the air expeditions in December 1958 a formerly unknown mountain range was

discovered in the region of the Pole of Relative Inaccessibility.

Regular flights have been made for a period of three years to explore the icebound Davis Sea. The pilots sometime flew for a distance of 700-800 km into the mainland. Valuable data have been obtained concerning the ice regime of the southern part of the Indian Ocean. The best time of the year for navigation in this sea is from the middle of January to the middle of March. In January-February there is a belt of floating ice 97-129 km wide to the north of Drigal Island. It consists of broken ice with cohesion of 3-6 and is relatively passable if air reconnaissance is efficient. By March the cohesion of the ice is markedly reduced. At the beginning of summer the ice that borders on the continent becomes a serious obstacle for the passage of ships. Its width varies from 19 to 27 km and its thickness is about 160 cm. In July the borderline of floating ice swerves to the North by 190-260 km and remains drifting about 610 km away from the coast up till September-October.

Soviet scientists gained important results in the study of Antarctic seas. As a result of three sea expeditions on the "Ob" a detailed study was made of many basic problems of the hydrology, geology and biology of the sea on a huge area in the Southern Ocean from the Princess Ragnilda Coast to Bellingshausen Sea (Long. 20°E). Comprehensive work has been accomplished by the diesel electric motor ship "Lena". In this part of the ocean more than 400 deep-sea investigations were made. Aerial photography of the coast between Long. 40° and 160°E (about one third of the total length of the coast) made it possible to draw the first reliable maps.

Oceanographic studies in this district conducted by Soviet scientists in cooperation with the explorers of other countries are supplying material for the first correct ideas about this important zone of the ocean.

Comprehensive combined studies of the Antarctic can be accomplished only on the

basis of close cooperation of scientists of different countries. Soviet polar explorers keep up constant ties with the Antarctic expeditions of USA, Australia, France and other countries. Mirny has radio communications with several score of foreign stations in the Antarctic. Australian, American and other scientists have visited the main Soviet Observatory and Soviet explorers have been to a number of foreign stations on the Antarctic continent and in the ports. An exchange of meteorologists took place between the Soviet and the USA expeditions. A Czechoslovakian scientist—Anton Mrkos is a participant of the third Soviet expedition. Recently on the decision of the Soviet Government the Oasis Research Station has been handed over to the People's Republic of Poland.

At present the diesel electric motorship "Ob" is being unloaded near Mirny. It brought with it new equipment and some of the members of the fourth Antarctic expedition which will continue the work that

has already been started. Soon the motor vessel "Mikhail Kalinin" will arrive at the settlement with the Soviet and Polish Antarctic explorers.

The three-years' experience and modern equipment will enable the Soviet explorers to undertake a march to explore the ice dome of the Antarctic. The length of the planned march is about six thousand kilometres. This is the longest march ever planned in the history of the ice continent. Soviet polar explorers will pass three poles—the geomagnetic, geographic and inaccessible poles. They will stop at many places where man had never set his foot before. This expedition will supply new data and disclose many secrets of the East Antarctic which has been much less studied up till now than the western part of the continent. In celebrating the three-years' anniversary of the Soviet combined researches in the Antarctic, Soviet polar explorers are determined to multiply the achievements of science in the study of the distant continent which is so full of secrets.