FIRST INDIAN AT THE SOUTH POLE*

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Adaptability certificate: Thinking that the Russian doctor on board the ship 'Viese' sailing to Antarctica might be asking for my International Health Certificate, I promptly gave him that. But he smiled and remarked, "Wintering over the South Polar Ice-cap where the temperatures range from -40 to -90°C and the winds blow with speeds exceeding 200-300 km per hour is not a joke, my friend. Your certificate is meant only for the posh cities
of the world. Antarctica demands from an individual the utmost in physical stamina and mental soundness with mature judgement so that a man working there may act quickly and positively in order to survive. Prior to selection for Antarctica, we conduct a thorough medical check-up and a tough physiological and psychological screening of our expedition members and also impart them a special training. Only after qualifying all these tests and training they are given 'adaptability certificate' and taken to harshest continent

Fig. 1. : Icebergs floating in the frozen Antarctic Ocean

I did not undergo any special acclimatisation programme or training before setting foot at the South Pole. I had no 'adaptability certificate' and the Soviets (erstwhile USSR) allowed me to participate in their Antarctic Expedition during 1971-73 at my own personal risk. My long Antarctic ordeal included many

unforgettable scary moments in the ice.

What is Antarctica? In Greek it means "Anti-Arctic i.e., the opposite of the Arctic". Including its permanently attached ice shelves, Antarctica covers about 5.5 million square miles (14.23 $\times 10^6$ km^2 approximately) surrounding the South Pole, and has 18,500 miles (29,767km) of coastline. It is as big as the United States and Mexico combined. About 95 per cent of the world's permanent ice is in the Antarctic: 7 million cubic miles (30.5 $\times 10^6$ km^3) of it. This great mass has made Antarctica the highest of all continents, its average elevation is about 4,500 feet (225m). The world's lowest temperature minus 88.3°C has been recorded in Antarctica and violent snowstorms with winds of over 250 km per hour speed are very frequent in this icy desert. It is the coldest and the windiest continent.

Fig. 2: Map of Antarctica and South Pole

Although there is so much ice in Antarctica, there is almost no fresh water. Such a cold dry area cannot support much life of any kind. On land only 4.5 per cent of which is bare, a few primitive plants exist, and there are bacteria and some insects and similar small animals. The Antarctic waters, however, abound in sea life ranging from microscopic plants, plankton to giant whales. The best-known birds in Antarctica are the flightless penguins, which walk erect and waddle along like a cartoonist's version of man returning from a formal dinner! Wandering through the ice pack, penguins frequently encounter seals, six species of which breed in the Antarctic. There are also colonies of some flying birds such as the polar skuas and snow

petrels. To the present knowledge, Antarctica has never had any native human population. Men now go to Antarctica primarily to study the earth, the space around it and the life upon it.

The climax of our Antarctic Expedition came in when we reached the geographic South Pole. I got lost in my deep thoughts while standing at the bottom of the world (90 degrees South) on a high ice-covered plateau more than 9,000 feet (nearly 2,700m) above sea level. The temperature at that time was 60°C and the pressure much below the normal. It was the place first reached by the great Norwegian explorer Roald Amundsen 60 years ago (1911). On January 17, 1912 about a month after Amundsen, Captain Scott and four other Englishmen stood on the same spot, who were later trapped by a blizzard and never returned home.

At this historical place there is an American station called Amundsen-Scott South Pole Station, which has been in operation since 1957, the International Geophysical Year. The sun sets here for the winter on March 22, not to rise again until September 21. A full year consists of only one day and one night, each of six months duration. On June 21, the sun begins its ascent marking Midwinter Day. As at all stations this turning point of the winter was celebrated with gusto. With the day marked by holiday routine, practically every one of us slept late. The only exception was our cook, who was busy preparing a lavish meal for that evening.

Now a desperate struggle of two months to reach 'Vostok' the pole of inaccessibility and extreme cold (having recorded the world's lowest temperature (minus 88.3°C). During our 1,500 km trekking from Mirny station to Vostok located at the geomagnetic South Pole, we had plenty of difficulties, we sometimes failed, we sometimes won, we always faced them and made all possible scientific observations.

Fig. 3: Glaciological and Geodetic observations being made on way to Vostok. The author participated in the 1,500 km sledge odyssey from Mirni to Vostok, the pole of cold, completed in one and a half month

Our trekking expedition comprising of heavy machines 'towmobiles' and dog sledges carrying about 30 tons of equipment for Vostok roared into action and slowly pulled out of Mirny during the summer. After two weeks, a heavy snowstorm began reducing the visibility to zero. Most of the route was 3,000 metres above sea level with constantly low temperatures, about minus 70°C due to which our snow tractors could not move. Many of our huskies pulling our sledges died on the way and we had to eat their meat in order to survive. Snowstorms and poor visibility continued to hinder our progress. One of our comrades who became ill with acute appendicitis died on the way and yet another fell into a deep crevasse and buried alive. Despite all these difficulties, we traversed 1,500 kilometres in two months, and conquered the pole of inaccessibility. I can forget anything in my life

but not these tough experiences. I must add here that one who has not travelled deep into the South Pole Ice-Cap cannot know Antarctica!

The coldest place in the world 'Vostok', at 78.45 degrees South and 106.8 degrees East, lies at an altitude of 3,488 metres on approximately 3,700 metres of ice. The air is perpetually drier then in the world's worst deserts. During the polar night, temperatures drop so low that they would normally freeze carbon dioxide out of the atmosphere which freezes at -78.5°C. The high altitude starves lungs of oxygen, and the normal rate of heartbeats nearly doubles. Here 15 of us wintered over, isolated from contact with rest of the world for more than nine months, half of this time in utter darkness. I must say that six months continuous darkness followed by six months daylight at the South Pole were the extremely boring phenomena of nature I experienced there. When I returned, I found that a 12 hour day followed by a 12 hour night were, indeed a great blessing!

Fig. 4: A view of the Soviet Antarctic station 'Molodezhnaya'. During the extremely cold, dark and stormy 6-month long night, some of the huts were blown off along with the inmates. Winters are harsh and there is plenty of snow accumulation due to violent snow-storms. Some huts are built underground wherein sound does not reach, nor does light filter through.

During our 1500 km sledge odyssey between Mirny and Vostok, we made snow measuring observations and set up new automatic stations for the continuous recording of magnetic variations and meteorological data in addition to our other field work on geodesy, glaciology and so on.

Circumnavigating all around the Antarctic continent on board the icebreaker ships 'Navarin' and 'Ob' during the expedition, was most thrilling voyage of my life which recalls me of Captain James Cook who between 1772 to 1775 first sailed around Antarctic and brought to an end the dream of an inhabited southern continent.

During the Antarctic circumnavigation our ships resupplied all the Soviet coastal stations viz., Mirny, Leningradskaya, Bellingshausen, Novolazarevskaya, Amery and Molodezhnaya and relieved the old staff with the new expedition members. We sailed all along the Antarctic Circle and chose the site of a new Soviet station 'Russkaya' on the shore of the Amundsen Sea. We took fuel and fresh food provisions for our ships and for the Antarctic stations from the port of Punta Arenas, Chile. But, unfortunately, the station Molodezhnaya could not be given sufficient food supply due to which we had to face a number of problems there. I visited several other stations operated by the Antarctic Treaty member-nations in order to collect maximum
possible scientific data.

Fig. 5: 'M-100' rocket at take-off from the launching-pad near 'Molodezhnaya' Antarctic station during the extremely cold, dark and stormy 6-month long South Polar night

Fig. 6: About 95 per cent of the world's permanent ice is in the Antarctic 7 million cubic miles (1 cubic mile is nearly 4.1 cubic kilometre) of ice. Large pieces of ice called icebergs break off from the ice-shelves and ice glaciers and float away from the coast. The author and Comrade Merculov resting in the Ice of an ice-berg.

I worked for more than a year at the station 'Molodezhnaya' which is the continental headquarters for the Soviet Antarctic Expeditions. During the harsh winter, an emergency was declared at our station due to the acute shortage of foodstuff and other essential provisions. Both the quality and quantity of food were utterly poor. Our tinned food also got exhausted during the extremely cold and stormy polar night. As a consequence, we had to live on the Antarctic seals, penguins and fish. I still remember my days in Antarctica when we also had to eat the meat of our favourite huskies in order to survive. Smokers at the station were often found searching for the used cigarette butts. When the 'Vodka' was also finished, many of us started drinking pure spirit mixed with tea-water, Antarctic whisky!

Besides this, we faced innumerable number of other difficulties while wintering in Antarctica. Comrade Evanov developed appendicitis trouble

and had to be operated. Two of our expedition

members became mentally ill due to long isolation and had to be closed indoors. During the winter, we encountered several violent blizzards with speeds exceeding 200 km per hour. Some of our houses were blown off along with the inmates and our unfortunate comrades died for the cause of science.

Rebirth! yes, in a way I was reborn when I fell into a deep crevasse in Antarctica on 14th March, 1972. I was hardly an inch away from my death when I was pulled out of the 'death pit' with long ropes by a timely rescue party. In another accident I fell down from a 200 metre ridge due to a helpless blind-walk in a violent snowstorm and lost few teeth and suffered a fracture in my legs. In November 1972, I undertook an independent trekking to a distant iceberg which was about 150 km far and named it as 'Indian Elephant Ice berg'. On the return from there, misfortune followed my footsteps. Growing weaker each day from the exertion and the lack of food, I also encountered violent storms and blizzards and lost the way. I met with several hair raising accidents during my South Pole odyssey, but fortune ever smiled on me and I always had a narrow escape.

Fig. 7: A heavy 'towmobile' machine, a sort of snow-tank which is the latest mode of transportation in Antarctica

Fig. 9: The author in the company of penguins. The penguins are very curious and social birds and frequently come close to camps, ships and groups of men to watch what is going on. They usually walk erect and waddle along looking like a cartoonist's version of man returning from a formal dinner.

Fig. 8: The seas surrounding the Antarctic continent freeze during winter months for hundred of miles offshore. In summer the ice breaks up to form pack-ice which constitutes a hazard to shipping and a barrier, making access to the coast extremely difficult. For these reasons special ice-breaker ships are used.

In Antarctica, I was the Project Scientist for carrying out the upper atmospheric rocket soundings from the main Soviet Station Molodezhnaya. The M-100 rockets could carry 67 kg payload upto 100 km altitude and were launched twice in a week. My research and investigations showed for the first time that sizable perturbations occur in the South Polar atmospheric structure during the winter.

My participation in the Soviet Antarctic Expedition in 1971-73 was made possible (through the efforts of Prof. P.D. Bhavsar. Prof,

P.R. Pisharoty and the late Prof. Vikram A. Sarabhai) under an agreement between the Indian Space Research Organisation and the Hydrometeorological Service of the USSR.

Editor's Note

India is amongst few countries of the world that has been actively pursuing programmes to conduct wide ranging studies on Antarctica. It has already established a permanent station on this icy continent. The first Indian expedition to Antarctic Programme was undertaken in 1981. Since then India has been sending multi-disciplinary scientific expeditions to Antarctica every year. In 1983 India commissioned its first research station in Antarctica, which was named as 'Dakshin Gangotri'. It has since been replaced by the indigenously designed second Indian permanent station, 'Maitri' with adequate infrastructure facilities for conducting scientific research of contemporary nature in the icy continent. India has always recognised the importance of preserving the pristine nature of this remote and unique continent. To uphold this commitment, India, an original votary of the Protocol on Environmental Protection to the Antarctic Treaty, has ratified this Protocol in April, 1996.