

A Visit to the South Pole

Adventures of the First Indian to Winter-Over the South Pole and
Explore Antarctica

Parmjit Singh Sehra

What is Antarctica?

Antarctica in Greek means 'Anti-Arctic' or the opposite of the Arctic. Including its permanently attached ice shelves, Antarctica covers about 5.5 million square miles surrounding the South Pole, and has 18,500 miles of coastline. It is as big as the United States and Mexico combined. About 95 percent of the world's permanent ice is in the Antarctic, 7 million cubic miles of it. This great mass has made Antarctica the highest of all continents, its average elevation is about 7500 feet. The world's lowest temperature, about -90 degrees C was recorded in Antarctica and violent snowstorms with winds of speeds over 250 km per hour speed are very frequent in this icy desert. It is the coldest and the windiest continent.

Although there is so much ice in Antarctica, there is almost no fresh water there. Such a cold dry area cannot support much life of any kind. On land, only 4.5 percent 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 a 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. Antarctica has never known to have had any native human population. People now go to Antarctica primarily to study the Earth, the space around it and the life upon it.

*Under a joint Indo-Soviet agreement, a young Indian scientist Parmjit Singh Sehra of the Indian Space Research Organisation (ISRO) participated in a Soviet Antarctic Scientific Expedition to the South Pole during 1971–1973 and became the first Indian ever to spend a winter there, as well as circumnavigate and explore the Antarctic continent. The former USSR honored him with the prestigious Soviet Antarctic Medal, Ribbon and Polar Watch. A key figure in the Polar history, Sehra, who has worked in the United Nations as a WMO/UN Expert, gives a brief account of his most venturesome South Pole odyssey in this article, excerpted from his book.



Solitary Volunteer

Vikram A Sarabhai, the then Chairman of the Indian Space Research Organisation (ISRO) and the Director of the Physical Research Laboratory (PRL), had a keen desire to send someone from India to the Soviet Rocket Launching Stations, especially the one in Antarctica, so as to avail of the rare opportunity provided by the Hydrometeorological Services (HMS) of the USSR. But none was ready for this venture because it involved great dangers and risk to life. The IMD had already withdrawn itself from their earlier commitment. P D Bhavsar, Scientific Co-ordinator of ISRO, sent a telegram from Moscow to P R Pisharoty of PRL, suggesting my name for participation in the 17th Soviet Antarctic Expedition. I immediately volunteered for this assignment.

I had to get prepared at a very short notice. Moreover, there was panic due to the Indo-Pak conflict for the liberation of Bangladesh. For these reasons, I could not buy many of the essential things needed for our Antarctic Expedition. Under great difficulties, when I went home to take the consent and the blessings of my parents, I was welcomed by a perfect black-out and the danger signals of the sirens. My condition may be described like the one who had to fight not at the Indo-Pak border but at the South Polar Ice-Cap against the awful blizzards and the cryogenic environs of Antarctica where no Indian had ever wintered over earlier. My parents encouraged me to go ahead with the Antarctic Expedition and explore the South Pole.

The Deputy High Commissioner of Australia in Bombay, T V Holland, had granted me an Australian visa subject to my personal meeting with him. As prescheduled, I called at his residence. He told me a lot about the horrors of working in Antarctica and said that before a man is finally selected for participation in an Antarctic Expedition, he is thoroughly screened medically and psychologically in order to determine his adaptability to the extreme climate of Antarctica. After having passed all such tests, he is imparted a special training on how to survive in Antarctica in difficult times. He advised me that I should have also undergone all such tests and training in my own interest lest the adventure should become a misadventure. I did not realize the depth of his advice till I boarded the scientific research vessel *Professor Viese*. 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 allowed me to participate in the Expedition at my own personal risk.

Aboard the Ship *Professor Viese*

I boarded *Professor Viese* from the port of Fremantle, Perth, Australia. *Professor Viese* belonged to the Arctic and Antarctic Scientific Research Institute, Leningrad, the erstwhile



USSR. The vessel, constructed in 1967, had been specially designed for polar operations. It was a floating institute, carrying on the investigations of the seas and oceans. The vessel had 29 well-equipped scientific research laboratories, a photo-laboratory, and an experimental workshop. The up-to-date instrumentation of the laboratories enabled a wide range of investigations in air and water spaces to be carried out by the expedition members to and from Antarctica. Oceanographic projects were carried out primarily while in the Antarctic and near the Antarctic waters. Meteorological work was carried out throughout the voyage. During my stay aboard this vessel, I spent most of my time in visiting its various scientific laboratories and collecting useful scientific data.

Although it was my very first sea voyage, I never felt any sort of sea sickness. I really enjoyed my journey to Antarctica and also collected a lot of useful scientific data. *Professor Viese* had a displacement of 6934 tons, an overall length of 124 metres, maximum width of 17.5 metres, beam depth of 11 metres, a maximum speed of 18.6 knots, service speed of 16.5 knots and a range of 15,000 miles. The 29 scientific laboratories covered an area of 620 square metres and housed 80 scientific staff scientists. The ship also had a crew consisting of 86 members. The up-to-date instrumentation of *Professor Viese* permitted navigation in different conditions. The rolling dampers reduced rolling during a storm to the minimum. The strengthened hull of the vessel permitted it to move in hard ice conditions. The air-conditioners provided a good micro-climate in every part of the vessel.

Antarctica Arrives

It was summer time when we reached Antarctica but the air temperature was always below freezing point. Also, it was that period when one could not make out whether it was morning, noon, afternoon, evening or night unless one consulted one's wrist watch. The first thing which I saw on reaching Antarctica was a series of huge ice masses standing in the frozen ocean, commonly known as icebergs. "It is really a fairyland where even the fairies do not dare dwelling", were my remarks at the first sight of that place.

At the Antarctic Observatory *Mirny*

We stayed for quite some time at the Soviet Antarctic observatory *Mirny*. Here, I learnt a great deal about the Soviet Antarctic exploration and research. During the second International Polar Year, 1932–33, a modest Soviet Antarctic Expedition was planned, but it never materialised. It was as late as on February 13, 1956, that the Soviet flag was first hoisted over *Mirny* located at 66° 33' 05" South latitude and 93° 00' 58" East longitude, its height above the sea level being 35 metres. The scientific work being done at the observatory *Mirny* included meteorology,



seismology and aerology, actinometrical and ozonometrical measurements, synoptic weather service, studies on geomagnetism, ionosphere, cosmic rays, aurora, and earth currents, submarine biology, and medicine.

At the Geographic South Pole

The climax of our Antarctic Expedition came when we reached the Geographic South Pole. I was lost in deep thought while standing at the bottom of the world (90° South) on a high ice-covered plateau more than 9,000 feet above sea level. The temperature at that time was -60°C and the pressure much below normal. It was the place first reached by the great Norwegian explorer Roald Amundsen about 60 years ago. On January 17, 1912 about a month after Amundsen's visit, Captain Scott and four other Englishmen stood on the same spot. They 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 is 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.

At the Geomagnetic South Pole

The smallest and the most remote station in Antarctica, *Vostok*, is located on the Earth's Geomagnetic South Pole at $78^{\circ} 27' \text{S}$, $106^{\circ} 48' \text{E}$ at an altitude of 3,488 metres on approximately 3,700 metres of ice. It is the coldest place on earth inhabited by man, at one time having recorded a temperature of about -90°C . The air is perpetually drier than in the world's worst deserts. During the polar night, the temperatures drop so low that they would normally freeze carbon dioxide out of the atmosphere which condenses at -8.5°C . The altitude starves lungs of oxygen and the normal rate of heartbeat nearly doubles. Here, about 15 men winter over each year, isolated from contact with the outside world for more than nine months, half of this time in utter darkness.

The annual re-supply tractor train from *Mirny* to *Vostok*, traveling a distance of about 1,500 km, starts around 10th January and arrives at *Vostok* around 20th February every year. This tractor train is the primary means of re-supply for *Vostok*. There was a desperate struggle for two months to reach *Vostok*. During our 1,500 km trek from *Mirny* station to *Vostok*, we had plenty



of difficulties; we failed sometimes and we won sometimes, but we always faced the difficulties and made all possible scientific observations. Our trekking expedition comprising of heavy machines “towmobiles” and dog sledges carrying about 30 tons of equipment for *Vostak* 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 -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 was buried alive. Despite all these difficulties, we traversed 1,500 km 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 traveled deep into the South Polar Ice-Cap cannot know Antarctica! I must say that six months of continuous darkness followed by six months of daylight at the South Pole was an extremely boring phenomenon of nature I experienced there.

During our 1,500 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, etc.

Circumnavigation of Antarctica

A complete circumnavigation and exploration of the Antarctic continent by an Indian! Yes, I am fortunate to have done it by sailing on board the icebreaker ships *Navarin* and *Ob* during the 17th Soviet Antarctic Expedition. Navigating all around the Antarctic continent and its complete exploration was the most thrilling voyage of my life.

During the Antarctic circumnavigation and exploration, our ships re-supplied all the Soviet coastal stations, viz., *Mirny*, *Leningradskaya*, *Bellingshausen*, *Novolazarevskaya*, *Amery* and *Molodezhnaya*. We could relieve the tired staff and the new expedition members could take charge. 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 Soviet 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 many problems. I visited several other stations operated by the Antarctic Treaty member-nations in order to collect maximum possible scientific data.



At Puerto Percy and Punta Arenas, Chile

The supply ship *Navarin* first reached Puerto Percy, Chile, which is a small island with a few government quarters and facilities for the ships to refill fuel. Here the empty tanks of *Navarin* were refilled with the requisite fuel and then the ship called at the free port of Punta Arenas, Chile, which is said to be the southernmost city of the world.

Punta Arenas, Chile, being a free port nearest to the Antarctic, is in fact, the centre of operation of the Antarctic expeditions of many nations. Expedition vessels under various national flags, often call at this port. When I visited the city in order to post some letters and reports, to my great surprise, I met some Indian businessmen there. I was told that there was a Sindhi colony in the city where more than 20 Indians were dwelling.

I still remember a very interesting incident which happened while I was walking in the world's southernmost city in Punta Arenas. On seeing Sri Guru Nanak Devji's picture in a shop, I just stopped outside there guessing that this shop must be belonging to an Indian businessman. My guess was right because promptly came a voice from inside the shop saying, "*Sardarji, Andar Aa Jao!* (Please, come inside)".

I entered the shop and was given a very warm welcome by the Sindhi businessman who owned that shop. He gave me a high tea party inside his shop and talked to me a lot in our mother tongue Punjabi. I told him that I was a lone Indian participant in the 17th Soviet Antarctic Expedition which was, in fact, a scientific expedition to the South Pole and that the Russians have told me that I would be the first Indian ever to winter over the South Pole and circumnavigate and explore the Antarctic continent. I also told him that our ship *Navarin* had called at Punta Arenas to take fresh water, all the food provisions, and fuel, for its expedition members.

He could not understand the significance of scientific expeditions very much and he remarked, *Isda matlav aih hoye ke hun Punjabi lok South Pole ate Antarctica vich bhi ja ke rahen lag pai han. Ih daso ke othe ja ke tusin kadha business karoge, ate isda kee faida hovega*" (Does it mean that now the Punjabis have started settling at the South Pole in Antarctica also? Please tell me as to what business you will be doing there and what would be the anticipated profit from that business). I just could not help laughing! After refilling fresh water and loading fresh food supply, etc., *Navarin* sailed back to Antarctica.

Wintering over the South Polar Ice Cap

I worked for more than a year at the station *Molodezhnaya*, which is the continental headquar-



ters for the Soviet Antarctic Expeditions. During the harsh winter, an emergency was declared at our station due to the acute shortage of food 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 remember my days in Antarctica when we also had to eat the meat of our favorite huskies in order to survive. Smokers at the station were often found searching for used cigarette butts. When the Vodka was also finished, many of us started drinking pure spirit mixed with tea-water, called 'Antarctic whisky'! Comrade Evanov developed appendicitis and had to be operated. Two of our expedition members became mentally ill due to the long isolation and had to be confined. During the winter, we encountered several violent blizzards with speeds exceeding 200 km per hour. Many of our houses were blown off along with the inmates and some of our unfortunate comrades died for the cause of science.

Rebirth in Antarctica

Rebirth! Yes, in a way I was reborn when I fell into a deep crevasse in Antarctica on 14th March. I was just an inch away from 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 a few teeth and suffered a fracture in my legs. In November, I undertook an independent trekking to a distant iceberg which was about 150 km away and named it as 'Indian Elephant Iceberg'. On my return journey 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 my way. I met with several hair-raising accidents during my South Pole odyssey. But fortune always smiled on me and every time I had a narrow escape and managed to survive the ordeals.

Antarctic Project Scientist

In Antarctica, I was the Project Scientist for carrying out the upper atmospheric meteorological rocket soundings from the main Soviet station *Molodezhnaya* by using M-100 rockets which could carry 67 kg payload up to about 100 km altitude and were launched twice in a week. My research and investigations showed for the first time that sizeable perturbations occur in the South Polar atmospheric structure during the winter. The findings of my work have been published in international scientific journals and the Gujarat University awarded me the Doctorate degree for my research work discussed in my PhD thesis entitled "Atmospheric Structure: Exploration over Antarctica and Inter-hemispheric Comparison".



REFLECTIONS

Recognition and Awards

The former USSR awarded me the prestigious Soviet Antarctic Medal, Soviet Antarctic Ribbon and Soviet Polar Watch in recognition of my Antarctic explorations. The New Zealand Antarctic Society has also honoured me. Based on my achievements and Antarctic explorations, I have also been elected as a Member of the American Meteorological Society (MAMS) and a Fellow of the Royal Meteorological Society (FRMetS) and a member of the Canadian Meteorological and Oceanographic Society (MCMOS).

My South Pole odyssey sparked tremendous interest in India for further exploration of Antarctica, including the opening of the Indian Research Bases in Antarctica, *Dakshin Gangotri* and *Maitri* with the launching of regular Indian Antarctic Expeditions since 1982. This is a great reward for me as it was my most cherished dream come true!



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Errata

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Article: The Little Known Story of $F = ma$ and Beyond
by Amitabha Ghosh

Page 1165: Line 1: RHS of (10) should be read as RHS of (9)
 Line 3: RHS of (11) should be read as RHS of (10)
 Line 13: induction given by (10) should be read as
 induction given by (9)

