SCIENTIFIC REPORT

OF

SECOND INDIAN EXPEDITION TO ANTARCTICA

TECHNICAL PUBLICATION NO 2

DEPARTMENT OF OCEAN DEVELOPMENT
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NEW DELHI 110 003
INDIA

1985

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INTRODUCTION

"To action alone hast thou a right and never at all to its fruits,
let not the fruits of action be the motive,
neither let there be any attachment to inaction" — Geeta

These are the very appropriate words for the members of the Indian team to whom Antarctica is a place of action. The icy continent poses a challenge to prove one's ability and competence in any type of scientific activity that he desires to pursue. In fact Antarctica brings out the best in a person individually.

The scientists of the Second Indian Expedition with their undaunted courage and determination, followed the tradition laid down by the First Indian Expedition and accomplished their scientific objectives successfully; be it the study of the krill in the sea; the microbes in the ice; the physical features of the floating icebergs; rocks of *Dakshin Gangotri;* meteorological conditions, geomagnetism or radiophysics in Antarctica. The tasks were quite diverse, yet the achievements significant and exhilarating, thus fulfilling the faith and trust imposed upon them by the nation.

This publication gives the details of scientific investigations carried out during the Second Expedition. It not only brings out the results of the work on the data and samples collected from Antarctica but should be viewed as a fore-runner to the future work the Indian scientists will undertake in Antarctica.

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September, 1985

PREFACE

The Government of India, after their first successful expedition of 1981-82 decided to launch a second expedition during the winter of 1982-83 (summer season at Antarctica) The coordinating agency for this expedition was again the Department of Ocean Development.

It was also decided to involve the following scientific agencies for initiating research studies - to be continued in future — as part of this expedition:

(i) Geological Survey of India (Ministry of Steel and Mines)

(ii) India Meteorological Department (Civil Aviation)

(iii) National Physical Laboratory (Council of Scientific and Industrial Research)

(iv) National Institute of Oceanography (Council of Scientific and Industrial Research)

(v) National Geophysical Research Institute (Council of Scientific and Industrial Research)

(vi) Indian Institute of Geomagnetism (Civil Aviation)

(vii) Naval Physical and Oceanographic Laboratory (Defence Research and Development Organisation).

The main objectives of the expedition were defined as:

(i) to select a site for a permanent station

(ii) to carry out various scientific research activities

(iii) to establish a communication link between India and Antarctica

(iv) to prepare and maintain an air strip for aircraft landing

(v) to carry out reconnaissance of area upto 100 km from the base for future work.

In their endeavour the scientists were supported, in the field, by the representatives of the following organisations of Government of India:

1. Indian Navy
2. Indian Air Force
3. Indian Army
4. Ministry of Information and Broadcasting
5. Bharat Electronics Limited

The team spent eight weeks on the continent carrying out the various scientific and other logistic research activities including a reconnaissance of the Wholthat mountain ranges 200 km south of the base research station. The latter (station) was hit by a severe blizzard on 19th and 20th January, 1983, with wind velocity going upto 72 knots (150 km) per hour which practically demolished the whole station and caused a lot of damage to scientific instruments and equipment. Having come just in the wake of a successful planned air dropping on 18th February, 1983, the team was caught unaware by the blizzard.

The team returned to Goa on 21st March, 1983, to a very warm welcome, after having spent 10 days, which besides the stay of 56 days on the icy continent, had involved a sea journey of about 24,000 km.

Scientific papers of this publication cover the various aspects of the scientific investigations carried out by the Second Expedition team to Antarctica.

The leader and the members of the Second Indian Scientific Expedition to Antarctica express their deep sense of gratitude to Shrimati Indira Gandhi, Late Prime Minister of India, for the keen interest shown by her in the activities of the expedition and the welfare of the members.

I would like to convey our thanks to Shri Shivraj Patil, Minister of State for Science & Technology, Atomic Energy, Space, Electronics and Ocean Development, Govt. of India, for his encouragement and to Shri Krishnaswamy Rao Saheb, Cabinet Secretary, for his personal interest in the activities of the expedition. To Dr. S.Z. Qasim, Secretary, Department of Ocean Development, the team and the leader in particular are thankful for the continuous guidance given both in planning and the execution of the job. To Shri K. Saigal, Additional Secretary, Department of Ocean Development; Shri R. Rajmani, Joint Secretary to the Prime Minister; Shri A. Dhar, Joint Secretary, Deptt. of Mines and Shri A.K Mathur, Joint Secretary and Financial Adviser, Department of Ocean Development, for their sustained moral support, continued advice and help in the execution of the project.

Thanks are also due to the Chief of the Army Staff, the Chief of the Naval Staff and the Chief of the Air Staff for the logistic and medical support given to the team. I would like to mention here the help and support given by Admiral Mukherjee, Deputy Chief of the Naval Staff, Air Marshal C.V. Gole, Deputy Chief of the Air Staff, Lt. Gen. V.V.S. Pratap Rao, Director General, Armed Forces Medical Services and Captain P.I. Oommen, Director, Naval Oceanology and Meteorology.

I would like to express my gratitude to the Director General, Geological Survey of India; Director General, India Meteorological Department; Director General, C.S.I.R., Director, Indian Institute of Geomagnetism; Director, N.G.R.I. and Director, N.P.O.L. for all the help rendered and for keeping the various facilities of their organisation at the disposal of the team.

Thanks are also due to Shri Mathur, Joint Secretary, Ministry of Information and Broadcasting; the Chairman, Indian Oil Corporation and to Capt. Parabhala of B.E.L.

I would like to convey my thanks to the Director, N.I.O. and his officers, in particular to Dr. A.H. Parulekar, for the support given to the team both at the time of its departure from Goa and on its arrival.

The Leader of the team and in fact the families of the team members, through the pages of this report would like to express their deepest gratitude to Shri J.L Sarin, Director, Deptt. of Ocean Development, whose untiring efforts of organising and later maintaining a liaison between the team members and their families has been the greatest contributory factor towards the success of this expedition.

The Leader would like to express his deep appreciation for the dedication to work and devotion to duty exhibited by all the team members.

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September 1985

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C R Sreedharan (Dy Leader)

M K Ka

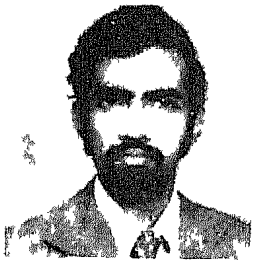
S K Chakrabor y

A K Sharm

\ S n

P K P r ch

S G Prabhu Matondk



Lu D Cruz

G S M t

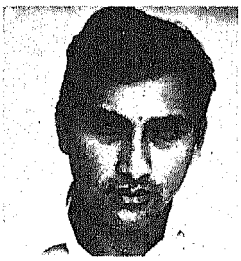
H R S Sastr

D Haldank

A K Andhare

D J Singh

P.K. Nayar



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