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German Antarctic Expedition 1979/80 to the Filchner/Ronne Ice Shelf

— Site Survey —
Scientific Results

Deutsche Antarktis-Expedition 1979/80 zum Filchner-Ronne-Schelfeis

— Vorexpedition —
Wissenschaftliche Ergebnisse

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INTRODUCTION

The Federal Republic of Germany has signed the Antarctic Treaty and has become member of the Scientific Committee of Antarctic Research through the Deutsche Forschungsgemeinschaft. By these facts Germany has committed itself to intensive and long term basic research in Antarctica. Within this frame it was planned to establish a winter-over base on the continent. Since our scientific community has concentrated part of the research programme on the Filchner/Ronne Ice Shelf and its surrounding mountainous areas, the station should be built on the Ronne Ice Shelf west of Berkner Island.

The Ronne Ice Shelf is hardly accessible and about almost unexplored from the seaward side. Because of these logistical difficulties an expedition was sent to the Ronne Ice Shelf in December 1979 to carry out a detailed reconnaissance or site survey respectively relevant for the construction of the base and the seasonal access. The achievements of this expedition are presented in this volume.

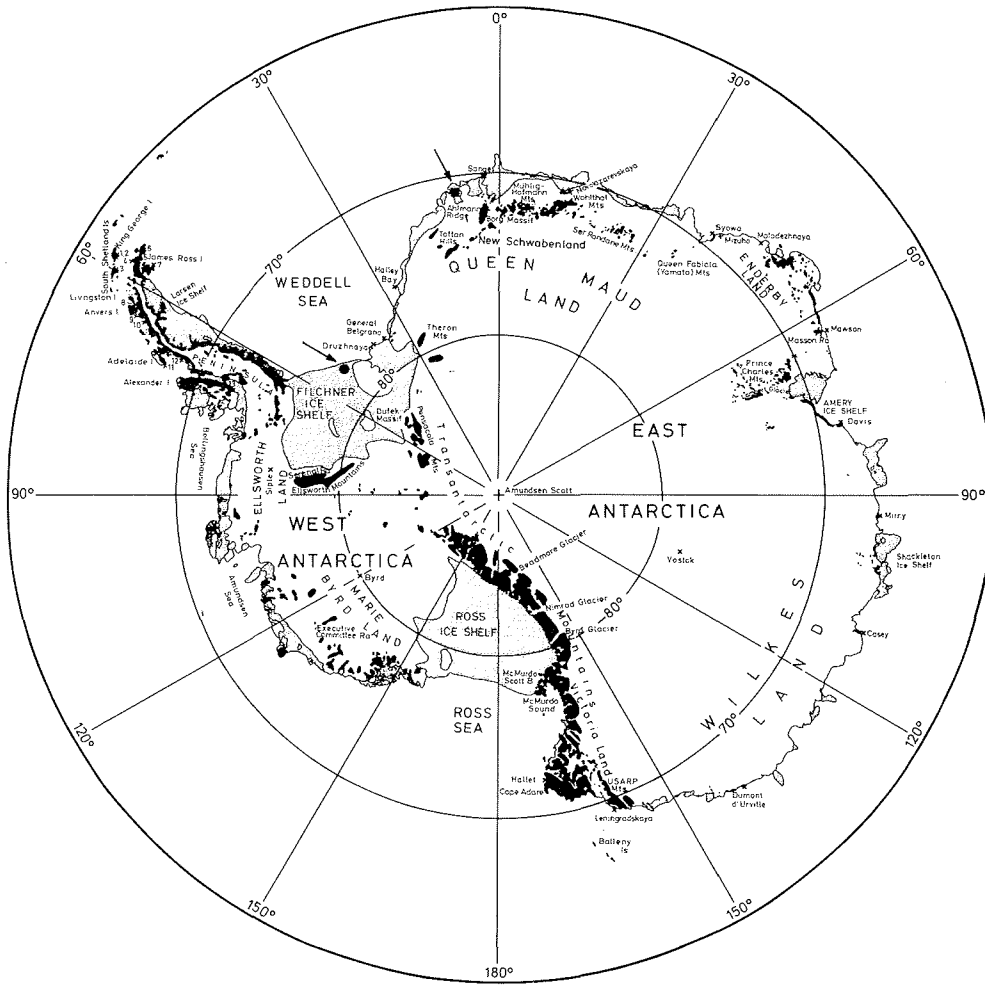
The site-survey expedition left Buenos Aires on December 18, 1979 on board the Norwegian research-icebreaker POLARSIRKEL under its master Captain Aklestad. This ship was chartered because it had successfully operated during two previous Norwegian expeditions in the Weddell Sea. POLARSIRKEL had proven to be effective as well as suitable for operations of our size in ice covered waters.

The expedition comprised 21 members being responsible for the different scientific investigations which are briefly outlined in the following chapter.

The members were:

- G. FUCHS, Engineer
- T. GAMMELSRØD, Oceanographer (Norway)
- H. GERDAU, Geodesist
- P. HAG, Radio Operator and Electronics
- T. HELDT, Photographer
- K. HENNING, Engineer
- M. KELLER, Geophysicist (Argentina)
- N. KLAPDOR, Physician
- H. KOHNEN, Glaciologist and Expedition Leader
- K. LINDNER, Engineer
- E. MARSCHOFF, Marine Biologist (Argentina)
- K. MENSSEN, Technician
- D. MÖLLER, Geodesist
- O. REINWARTH, Glaciologist
- R. SCHNEPPENHEIM, Marine Biologist
- J. SCHWARZ, Glaciologist
- L. SUHRMEYER, Navigator
- N. SLOTSVIK, Oceanographer (Norway)
- K. WASSERTHAL, Helicopter Pilot
- E. WENZEL, Helicopter Mechanic
- P. WESTERMANN, Helicopter Pilot

Two helicopters were taken along for aerial survey, photography and radio echo-soundings. One tracked heavy vehicle, two snow scooters and one field station belonged to the inventory of the expedition for use on the ice. The major goal of the expedition was to assess the possibility of access through the Weddell Sea to the Ronne Ice Shelf and to search low ramp-like features in the barrier suitable for docking and loading. The hinterland of such features had to be more or less free of crevasses to be safe for over-snow



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|------------------------------|--------------------------|
| 1 Bellingshausen | 8 Almirante Brown |
| 2 Presidente Frei | 9 Palmer |
| 3 Capitan Arturo Prat | 10 Argentine Is |
| 4 General Bernardo O'Higgins | 11 Adelaide Is (Rothera) |
| 5 Esperanza | 12 Stonington |
| 6 Petrel | 13 Fossil Bluff |
| 7 Vice Comodoro Marambio | |

Fig. 1: Map of Antarctic with research bases. Arrows point to German stations: circle = Filchner Station, the summer station established in 1979/80, square = Georg v. Neumayer Station, built as a winter-over base in 1980/81.

Abb. 1: Karte der Antarktis mit bestehenden Forschungsstationen. Die Pfeile zeigen die Lage der deutschen Stationen an: Filchner-Station (Kreis), Sommerstation seit 1979/80, und Georg-von-Neumayer-Station (Quadrat), Überwinterungsstation seit 1980/81.

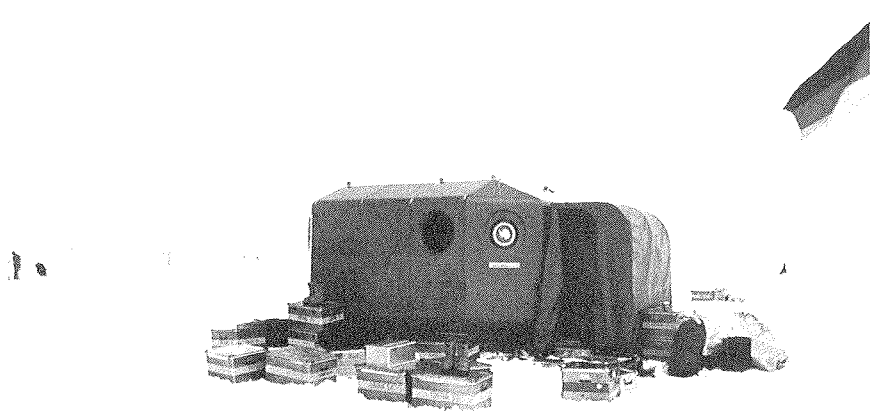


Fig. 2: The cabin of the Filchner Station.

Abb. 2: Die Wohnkabine der Filchner-Station.

operations. Careful inspection of satellite images and ice charts from the last decade had already shown that a shore lead opens up every summer along the barrier. The ice-free channel should be used and explored during our expedition.

The expedition headed from Buenos Aires via South Georgia towards Antarctica at about Cape Norvegia. The programme also encompassed marine biological and oceanographic projects which were carried out on the way to Antarctica, along the continental fringe and on the way back to South Africa. From Cape Norvegia, the expedition should follow the continental ice barrier as far west as possible. The pack ice conditions were surveyed during the whole cruise by satellite pictures received from Tiros N and NOAA 6. This technique has proven to be a powerful navigation aid for struggling through the pack ice. Fortunately, the shore lead was widely open from Cape Norvegia to the Antarctic Peninsula during the 1979/80 season. Due to this fact, the expedition already reached the Antarctic Peninsula in early January 1980 having mapped and surveyed the barrier over most of the distance. Two sites were detected which seemed to be appropriate as location of the winter-over base. At one of these sites ($77^{\circ}09' S$, $50^{\circ}38' W$), the expedition carried out intensive investigations during January and February which are relevant for the construction, life expectation and annual support of the station. Basic information necessary for this task could also be acquired at the other location Atka Ice Port during the second half of February. The expedition returned to Cape Town on February 27, 1980.

The expedition was financed and supported by the Federal Ministry of Science and Technology and jointly sponsored by the Senate of Science and Culture of Bremen. Other agencies like the German Embassy in Buenos Aires, the Direccion Nacional del Antartida and the port authorities in Bremerhaven were most helpful and gave valuable assistance. The successful field work could only be achieved by the steady and enthusiastic engagement of all expedition members in conjunction with the experienced and flexible leadership of POLARSIRKEL.

Münster/Germany

Heinz Kohnen