

A1 Title: **History of institutionalisation of Antarctic research within SCAR**

A2 **Submitted by Cornelia Lüdecke**

Centre for the History of Science, Mathematics and Technology

University of Hamburg

for the **establishment of an Action Group**

under the Delegate Committee on Standing Committees and Outreach

A3 **Expected duration** of program: 3 years (**2005-2007**)

A4 **Estimated SCAR funding** required over the total program lifetime **5,000 Euro per year**

A5 **Program Summary**

The aim of the history group is to obtain insight in the development, how Antarctic research was institutionalised within SCAR. We want to study to what degree research in the Antarctic has been driven by scientific criteria and to what extent compromises were made in the light of political barriers and logistical limitations. In historical perspective, a review will be made of essential background factors at work, both scientific and non-scientific ones, when nations were moved to participate in the IGY (1957-58) at time of the Cold War. Additionally socio-cultural background factors will be considered with regard to major nations that chose not to contribute to the IGY.

B1 **Objectives of the program**

The aim of the history group is to obtain insight in the development, how Antarctic research was institutionalised within SCAR. We want to study to what degree research in the Antarctic has been driven by scientific criteria and to what extent compromises were made in the light of political barriers and logistical limitations. In historical perspective, a review will be made of essential background factors at work, both scientific and non-scientific ones, when nations were moved to participate in the International Geophysical Year (IGY, 1957-1958) at the time of the Cold War. Additional socio-cultural background factors will be considered with regard to major nations that chose not to contribute to the IGY. Logistical limitations and physical hazards also played a role in setting agendas for exploration and research. The early attempts to establish an international polar organisation will be seen as a backdrop referring to the political role of the Antarctic treaty and to the success in creating the Scientific Committee on Arctic Research (SCAR). Factors that enabled (or constrained or hindered) the institutionalisation of Antarctic research will be studied also with an eye to drawing lessons for the future. Pertinent in this respect are the different roles played by non-governmental scientific organisations as distinct from intergovernmental organisations or modes of international organisation.

## B2 Scientific background to the program

Traditionally, field science practised in remote geographical regions was either a by-product of exploration or an activity exploited by economical interests or territorial claimants. An important aspect of the early international polar year initiatives (IPY) in the past has been the requirement that expeditions and projects be driven by scientific research instead of exploration. This principle was clearly enunciated by Carl Weyprecht and Georg von Neumayer at the outset of the first IPY (1882-1883) focussing on meteorological and magnetic investigations in the Arctic region (Krause 1993, Lüdecke, 2004). In 1906, it was reiterated in Belgium by a number of internationally minded scientists (Henryk Arctowski, Otto Nordensjöld, Jean Charcot, William Speirs Bruce, and others). This was when efforts were afoot to establish an international polar commission, a hybrid combination of inter-governmental and non-governmental scientific and other concerns (Lüdecke 1993, 2001, Elzinga 2004). Although such a commission was actually founded, it only had a very marginal influence on events and was soon eclipsed by the First World War. The difficulties surrounding this attempt will be seen as a backdrop to the later success in creating SCAR.

When the idea of a second IPY (1932-1933) came up during a meeting of the International Society for the Exploration of the Arctic Regions by Means of the Aircraft (AEROARCTIC), it was restricted by the world trade depression (Lüdecke 1995). In practice it turned out that political expediency to take part in such an enterprise or not often was stronger than the ideal of science-driven expeditions and criteria for siting stations. It was quite obvious that some countries could not afford to send out costly expeditions to the south, so the second IPY also focussed on the Arctic and broadened our meteorological knowledge on the upper atmosphere. Further research concerned the connections of magnetic disturbances and auroral display. For the first time radio-waves were used to investigate the ionosphere.

After World War II a new landscape of science emerged and was settled under the political background of the Cold War, which divided the hemispheres in east and west. The US and the USSR military showed strong strategic interests in Antarctica. Despite this political tension, a new attempt was made to establish a global observing program of a new IPY (Elzinga 1933b, Fogg 1992, Nicolet 1992).

Instead of been limited to the polar regions, the entire surface of the earth should now be covered as well as possible. Due to this the research program became the agenda of the International Geophysical Year (IGY) lasting 18 months, starting on 1 July 1957 and ending on 31 December 1958. Nevertheless it was decided to concentrate on areas which would at one and the same time give an overview of most phenomena, and lead to new information on major ones in particular circumstances. Finally three particular areas were chosen: the Arctic and the Antarctic regions and the equatorial zone. It covered various problems relating to the upper atmosphere, which required simultaneous measurements on a global scale. Also geomagnetic and geographic factors had to be taken into account in establishing the program. While the USSR prevented a scientific co-operation in the Arctic, the polar research program of the IGY concentrated on Antarctica.

Logistical limitations and physical hazards played a certain role in setting agendas for exploration and research. Even during the IGY and its aftermath, when the Antarctic Treaty Organisation (ATO) was in place, several countries chose easy accessibility as a

prime consideration in placing stations in the Southern Ocean and Antarctic regions. Where single nations could not establish special observing stations in the defined areas of the IGY, they contributed with enhancing their routine measurement at already existing stations. In meteorology for instance, additionally to the usual observations forming part of synoptic meteorology and weather prediction, detailed measurements of solar radiation and atmospheric ozone were planned. Besides problems of telecommunications between the organisation of IGY and the stations of the geographical distributed network had to be solved. Many other agreements of a joint scientific program were made on an international basis. The manual to standardise observations of the ionosphere to obtain a coherent synoptic overview on the planetary scale is a good example for this, because no arrangements had been made ever before. Another subject was the influence of the sun on terrestrial phenomena, which demanded a continuously monitoring of the sun through a chain of observatories girdling the earth. Seismological events as well as variations of gravity were of geophysical interest. A glaciological program was included to generate world wide baseline data for further studies of long-term trends.

A new measuring technique to investigate the upper atmosphere in situ by means of rockets was introduced by the USA, USSR, United Kingdom and Japan. This was highlighted by the first mission of the Russian satellite Sputnik.

All in all the IGY was the first international scientific program on a planetary scale, in which 67 nations contributed their measurements from about 2.000 stations. It was the first time that Weyprecht's idea of a circle of stations around Antarctica was realised. This achievement led to the establishment of the Scientific Committee of Antarctic Research (SCAR) on 1 February 1958 under the auspices of the International Council of Scientific Unions (ICSU) (Ernster et al., 1991). Many of the IGY stations on the Antarctic continent became permanent. International regulations on peaceful research on a continent without any political borders were fixed in the Antarctic Treaty (AT), which was originally signed by 12 nations on 1 December 1959 and came into force on 23 June 1961 (Lewis and Smith, 1974). The main idea was to ensure freedom of exchange of Antarctic scientific information and results of investigations. The AT defined a unique international regime, driven by the requirements of science excluding nuclear and atomic bomb issues. It continued the practice of the IGY and turned it into a principle, guaranteeing the freedom of scientific research.

### B3 Program rationale / justification

2007-2008 will be the year of the 50th anniversary of the International Geophysical Year. Now the time has come, to established an Action Group under the Delegate Committee on Standing Committees and Outreach on the "History of institutionalisation of Antarctic research within SCAR". While the first 40 years of International research in the Antarctic within SCAR has already been described (*Fifield 1987*), the history group primarily will not have a look at the scientific results, but will investigate the underlying history of the IGY (*Elzinga 1993a, 1993b*). It is important not to lose the knowledge achieved – especially the unspectacular results – and to analyse the different ways of peaceful international collaboration in detail. This is not only of interest to polar researchers, but also for historians of natural and cultural sciences.

The political role of the Antarctic treaty and the role of science in it is an important question in this context, as Antarctica at the political level became constructed as a continent by and for science and peace. Such a study would not be complete without examining the impact of the Cold War on the IGY. Recent historical work has indicated that the IGY was simultaneously a crucial instance of international scientific co-operation at the height of political tensions between the Eastern and Western Blocs, and also an activity tightly integrated into the national security aims of major participant-states, including the United States and the Soviet Union. How Cold War tensions affected the practice of science during the IGY, and what lessons contemporary science planners and policy-makers can gain from a better understanding of the IGY's achievements and disappointments, are important anticipated outcomes from this project. This may help to highlight questions pertaining to the international geopolitical background.

There are many more questions to be posed and answered:

- Development of international joint research programmes
- Knowledge transfer within the polar community since the IGY
- Cultural diversity of participants of the IGY
- Reflection of the IGY in the media at time of the Cold War

Enabling and constraining or hindering factors in institutionalisation of Antarctic research more broadly under the auspices of the IGY within SCAR will be studied also with an eye to drawing lessons for the future.

#### **B4 Methodology and preliminary implementation plan**

Until now, there has been no international and multi-discipline group devoted to the history of polar research. The group conceived here will cover the history of the research in the southern hemisphere in respect to polar problems and the results achieved, the various background factors and cultural as well as political impact.

Due to considerable support already shown from historians, historians of science and polar researchers, the action group will consist of many specialists coming from outside of SCAR, who may form the nucleus of that group. It will be the first international group to deal with the history of Antarctic Research and its institutionalisation.

We will study to what degree research in the Antarctic has been driven by scientific criteria and to what extent compromises were made in the light of political barriers and logistical limitations, and levels of technological development as well as pertinent instrumentation. In historical perspective, a review will be made of essential background factors at work. These include both scientific and non-scientific ones, when nations were moved to participate in the IGY (1957-58). Additionally background factors will be considered with regard to major nations that chose not to contribute to the IGY like Germany for instance.

Our methods will be the same as historians use to analyse special events. We work with published materials displayed in various libraries, as well as with unpublished material to be found in different archives or in personal files. Interviews to catch oral history may also be very helpful to get hints and insight between the lines of published texts and other documents.

The plan is to have a first workshop in Hamburg in June 2005 to discuss several aspects of predecessors of the International Geophysical Year and the first attempts to institutionalise polar research.

#### **B5 Program management and governance**

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Our activities will be focussed on workshops and sessions during SCAR conferences, where we will define special working areas, present our results, and plan broader public outreach activities and further publications.

- The first meeting may take place in Hamburg in June **2005**.
- In Hamburg time we will decide on time and place of the second workshop in **2006**.
- The third workshop will be held in connection with the SCAR meeting in **2007**, where we will present our major results.

We do intend that the lifespan of the history group will continue after 2007.

#### **B6 Deliverable outcomes from the program including public awareness**

The results of our meetings will be published in national or international journals like "Polarforschung" or "Polar Record" or in single book chapters. Papers and posters presented at appropriate international scientific and historical conferences shall be published and also added to the results of the fourth International Polar Year (2007-08).

The outcome of the action group will give the historical background of the 50th anniversary of the International Geophysical Year in 2007/2008 and highlight various dimensions of previous polar years.

It is planned to give lectures to the public during a half day of our meetings to enhance public awareness and understanding of scientific efforts and progress regarding the 4th International Polar Year 2007-2008.

#### B7 **Biennial milestones against which progress can be evaluated**

**Reports** of each workshop/meeting of the history group will be sent to the Executive Secretary of the SCAR.

A **survey of our results** will be presented in papers and posters during the SCAR meeting in 2007.

#### B8 **Success factors** (what can we use to judge success?)

Success factors may be

- **workshops / meetings** which shall take place each year
- **public talks** during the annual meetings
- **papers** or **book chapters**

#### B9 **References cited**

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