

Recent meetings

Symposium on Antarctic Research, Potsdam, 11–14 September 1989

To mark thirty years of scientific research in Antarctica by the German Democratic Republic, the Central Institute for the Physics of the Earth and the National Committee on Antarctic Research of the Academy of Sciences of the GDR organized a multidisciplinary symposium at the Haus der Deutsch Sowjetischen Freundschaft in Potsdam. Although most of the hundred participants came from the GDR, the meeting was also attended by scientists from Bulgaria, FRG, Italy, Japan, UK and the USSR. At the opening session the increased involvement of the GDR in Antarctic science was traced from an initial programme that was entirely dependent on collaboration with the USSR, to the establishment of Georg Forster Station in the Schirmacher Oasis, and the development of a more independent programme. The occasion was marked by the presentation of commemorative medallions to all previous participants of GDR campaigns in Antarctica.

Formal presentations of oral papers were supported by a number of posters, exhibition material and evening film and slide performances. In all sciences there was a good balance between review and descriptive papers and a pleasing aspect was the amount of new information and preliminary interpretation shared between all those present.

One whole day was devoted to papers on geology, geophysics and geomorphology. The papers presented naturally focussed on the work of geoscientists of the GDR but, together with contributions from participants of other countries, the session covered a wide range of topics including problems related to the Antarctic Peninsula, Dronning Maud Land, the Shackleton Range, Lambert Glacier and the Ross Sea region. In many of these areas international activity has been intense and 'coffee-break' discussions revolved around identifying significant problems for future research and the need for an international attack on many of these.

Highlights in a second day, devoted to the physical sciences, included discussions of the crucial roles of dynamics and chemistry of the lower stratosphere to explain the springtime ozone depletion as observed by balloon-borne ozone sondes and by rockets within the polar vortex over Antarctica in 1987 and 1988. Results were presented on polar stratospheric clouds, aerosols and the long-term cooling of the stratosphere above Molodezhnaya station as the concentrations of 'greenhouse-effect' gases build up in the troposphere. Research on solar-terrestrial physics, trans-continental radio propagation, environmental isotopes, hydrology of Antarctic oases and geomagnetism was also considered.

Biological papers were concentrated into one half day but were backed up by a well-prepared museum exhibition of Antarctic biology. Preliminary results of a study of sea ice

as a biological habitat provided a contrast with on-land studies of the biota of Fildes Peninsula and freshwater algae at Schirmacher Oasis. On Fildes Peninsula wildlife is under considerable pressure from the large number of scientific stations in one relatively small area. Attention was drawn to the damage to successful breeding in seabirds caused not only by people in general, but even by scientists themselves making only a handful of visits to monitor progress.

The meeting clearly demonstrated the important contribution made by scientists of the GDR to a broad spectrum of Antarctic research and it is to be hoped that their next thirty years of research in Antarctica will be even more successful.

M.J. RYCROFT
M.R.A. THOMSON

28th International Geological Congress, Washington DC, 9–19 July 1989

One of the many broken resolutions in my life is that I would never attend an International Geological Congress. They are just too big and, with nearly 6000 participants, 28th IGC in Washington was no exception. However, hidden among over seven working days, each with some 28 parallel sessions, there was a significant contribution by Antarctic geoscientists. Indeed it could be said that the Congress was begun by Antarctic geologists, who staged the first ever field excursion to southern South America and the Scotia arc as one of the official Congress excursions. Because of differences in seasons, this was held in January/February 1989 and not July. [For a full report of this excursion see *Geotimes*, 34 (4) April 1989, 10–13.]

Contributions to the poster session of the Global Geosciences Transects Program on 11 July included four from Antarctica: Bransfield Strait region, Weddell Sea, Alexander Island—central Palmer Land, and northern Ross Sea. Whilst not as sophisticated as many of the interpretations from the inhabited parts of the world, where there are plenty of seismic and borehole data, those from Antarctica clearly showed that our state of knowledge is at least advanced enough for us to postulate structure at depth. Unfortunately the contributions to this session were arranged somewhat randomly and the Antarctic posters were separated by sections from many other parts of the world. Had they been grouped together, they would have made more impact and it would have been possible to make comparisons from one area to another.

The main Antarctic effort came in the second week and one whole session of 17 July was given over presentations on

'Recent advances in the knowledge of the geology of Antarctica'. Despite a large number of cancellations in the morning, the time was usefully filled by Antarctic geoscientists who just happened to have some slides with them for such an impromptu occasion. During the day, talks covered geophysical investigations of the Antarctic Peninsula margin and the Weddell Sea, tectonics and palaeomagnetism of the West Antarctic mosaic, uplift of the Transantarctic Mountains, crustal extension in the Ross Sea, a new interpretation of the Shackleton Range, basement studies in East Antarctica, and radiation and extinction events of polar biotas.

The following day included an Antarctic poster session in the morning and a series of papers on Antarctic marine drilling in the afternoon. There were 15 posters, most of which had been invited by the convenors, in order to demonstrate the broad scope and the international effort and collaboration of geological investigations in Antarctica. To a large extent they succeeded and most of the posters were well planned and professionally presented. However, there were some notable gaps, particularly in relation to the basement rocks of East Antarctica. Formal papers on marine drilling addressed the glacial history of the Ross Sea and Prydz Bay, outlined recent results from ODP Leg 120 to the Kerguelen Plateau, and reviewed evidence for environmental change as revealed in cores from the bed of the southern oceans.

Many Antarctic geoscientists who attended the IGC also took part in a three-day workshop on the Antarctic International Lithosphere Project (ANTALITH), which followed the congress on 19–22 July. Held at the National Academy of Sciences, the primary aim of the meeting was to stimulate a US initiative on the Antarctic lithosphere. However, it was open to other nationals with similar objectives and provided a useful forum for the exchange of information and ideas, and to lay the foundations of a major international collaborative effort in Antarctica. Formal presentations provided a wide-ranging review of techniques in use and advances made in the geophysical exploration of the polar regions. Some of the commercial approaches, though interesting, were on a scale beyond the capabilities of Antarctic programmes and would at best require careful adaptation to suit the logistic constraints and conditions experienced by scientists operating on academic, rather than commercial budget. Discussion at the end of the meeting enabled some progress towards the planning of ANTALITH, a geophysical transect along longitudes 120°W–60°E covering the Byrd Subglacial Basin, the Transantarctic Mountains front, subglacial cratonic basins of East Antarctica, the Gamburtsev subglacial highlands, and the Lambert–Amery aulacogen. The need to tie geophysical traverses into exposed rock wherever possible was stressed by the geologists and a long-term aim must be to drill into bedrock beneath some of the deep subice basins of Antarctica. Major contributors to the project are likely to be the

Federal Republic of Germany, UK, USA and USSR.

During the course of the two weeks, the opportunity was also taken to hold informal open meetings of the Geology and Solid-Earth Geophysics Working Groups of SCAR in preparation for the formal meetings to be held in São Paulo, July 1990.

M.R.A. THOMSON

BIOTAS Workshop, Cambridge, 27–29 September 1989

At the SCAR XX Meeting in Hobart in September 1988 the Biology Working Group accepted a proposal for the first major international project on Antarctic terrestrial and freshwater ecosystems. The BIOTAS (Biological Investigations of Terrestrial Antarctic Systems) convenor, Dr R.I. Lewis Smith, suggested that studies of colonization of Antarctica were both apposite in view of the consequences of global warming but impossible to achieve for the continent as a whole without substantial international agreement and input. The studies could contribute both to IGBP objectives and to a better understanding of the inadvertent introduction of non-indigenous organisms to Antarctica. SCAR agreed to fund a *planning workshop to establish in more detail the objectives and the framework for a programme focussed on 'Colonization in Antarctic terrestrial systems (including subantarctic, limnological and littoral systems)'*.

The workshop was organized by Dr D.D. Wynn-Williams and held at British Antarctic Survey. It was attended by active scientists from 11 SCAR countries (Australia, Chile, Federal Republic of Germany, France, India, New Zealand, Norway, Poland, South Africa, UK, USA) as well as by a small number of invited experts in particular fields. Invited participants from Argentina and Japan were unable to attend. With a small group and a wide range of well-informed opinions there was lively discussion of scientific objectives, standardization of methodologies, potential resource requirements and what constituted a realistic timescale for research and reporting.

In a series of expert introductions followed by lengthy discussions the workshop considered aerobiological sampling, survival of propagules, colonizer diversity, the colonization process itself and how to organize and handle the data generated. A final session was devoted to international co-ordination, communications (including publications) and proposals for providing detailed expert reviews within specific subject areas. Pilot studies or feasibility assessments are required for sampling systems, culture media, identification of diaspores, the use of marker organisms, and the potential for airborne sampling. There was general agreement that the ICSU-sponsored Microbial Strain Data Network appeared

to provide the well supported and flexible international database needed to handle the wide range of data types. Of particular importance was the opportunity to establish the different requirements for studying each group of organisms. An international Steering Committee, chaired by R.I. Lewis Smith, was agreed which reflects the contributions required from zoologists, botanists and microbiologists in achieving any general understanding of Antarctic colonization.

A detailed report will be presented at SCAR XXI (São Paulo, July 1990) which will cover not only the workshop itself but a series of recommendations arising from the specialist groups whose work has now begun. The workshop agreed that the BIOTAS Newsletter would fulfil a central role in communication but that the preparation of a manual of recommended protocols would be essential before co-ordinated sampling was undertaken. The format for this international programme incorporates both baseline co-ordinated sampling with fixed protocols and individual research studies (both experimental and observational) which should allow the widest participation in what is likely to be an exciting development in Antarctic science.

D.W.H. WALTON

Workshop on Magnetospheric Physics and a Proposed International Science Facility in Antarctica, Stanford, 24–28 April 1989

An international workshop was held at Stanford University, from 24–28 April 1989, to define the scientific and engineering requirements for a new international ELF/VLF wave injection facility to be placed in Antarctica. This workshop, sponsored by the US National Science Foundation, was attended by over 25 scientists from five countries. The discussions also encompassed recent scientific results of wave injection experiments, outstanding questions that lie ahead, and opportunities for international collaboration.

The workshop participants agreed that it was now clear that VLF radio wave injection from the ground is a powerful tool for studying the complex nonlinear processes that determine the high levels of ELF/VLF plasma waves in the Earth's magnetosphere, waves which in turn affect the dynamics of the radiation belts and also the coupling of the magnetosphere, ionosphere and atmosphere. In order to address important scientific questions in this field during the next decade it is highly desirable that a new ELF/VLF wave injection facility be in operation in the Antarctic by 1992 or 1993.

The global scope of the scientific problems, and the magnitude of the associated logistic requirements, will almost certainly require any new facility to be supported with resources from several international partners. This will be a novel development for Antarctica but in keeping with the spirit of scientific collaboration that characterizes the continent. The new facility should be available for experiments by independent investigators from different countries, in a manner similar to that at other upper atmospheric research facilities such as those at Sondrestromfjord, Arecibo and the EISCAT incoherent scatter radars.

The workshop recommendations will provide detailed suggestions for the use of this ELF/VLF facility within three fields:

1. remote diagnostic probing of the magnetosphere (especially whistler ducts, plasma changes and nonducted propagation)
2. simulation of magnetospheric wave-particle interactions (especially emissions, energetic plasma diagnostics, precipitation of electrons and protons, new mechanisms of electrical coupling between upper atmospheric regions, and the effects of particle precipitation on spacecraft and communications)
3. contribute to the International Solar Terrestrial Physics (ISTP) programme and the Solar Terrestrial Energy Program (STEP).

In order to address these scientific topics, the new international Antarctic ELF/VLF wave injection facility should have:

- easy access to locations in the Northern Hemisphere geomagnetic conjugate region,
- ability to inject waves onto both open and closed geomagnetic field lines,
- proximity to the plasmopause,
- excitation of wave-particle interactions involving >40 keV particles, and
- effective radiated power capability of 10–50 kW.

Based on the discussions at the workshop, most of these objectives can be realized with an Antarctic facility that is:

- located at geographic longitudes between 70 and 120°W and in the L-shell range of $4.5 < L < 5.5$,
- capable of operating at frequencies as low as 500 Hz, and
- supported by an array of antennas (possibly up to 200 km long) to increase the signal power injected into the ionosphere.

The authors of this brief report would welcome the views of colleagues.

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