

## Recent meetings

### **Twelfth Symposium on Polar Biology, National Institute of Polar Research, Tokyo, 6–8 December 1989**

Nearly 200 scientists, including participants from Canada, China, Norway and USA, attended the three-day meeting which covered both terrestrial and marine biology in Arctic and Antarctic areas. Conveners were Drs Hiroshi Kanda and Mitsuo Fukuchi, and the meeting was sponsored by the National Institute of Polar Research (Director: Prof. Takao Hoshiai), Ministry of Education, Science and Culture. Fifty one oral presentations and 17 posters were offered and the proportion of terrestrial and marine studies presented was nearly half and half.

In the terrestrial biology sessions, several presentations were focused on the flora and microfauna in the Yukidori Valley area (SSSI). This reflected the increased research activities there, carried out as part of the Japanese Antarctic Research Expedition (JARE) programme. Presentations on marine biology included work from both the Arctic (e.g. ISHTAR and PROMARE) and Antarctic. These indicate that there has been a recent increase in biochemical and physiological studies in the polar regions.

The proceedings for this symposium will be published by the National Institute of Polar Research, Tokyo, as the Proceedings of the NIPR Symposium on Polar Biology, No. 4. The next symposium will be in November–December at the same place. The first announcement will be distributed next May.

KENTARO WATANABE

### **Solar Terrestrial Predictions Workshop, Sydney, 16–20 October 1989**

More than 100 scientists from 14 countries attended the third Solar Terrestrial Predictions Workshop during 16–20 October 1989 at Leura near Sydney, Australia. The meeting was arranged by the International Ursigram and World Days Service (IUWDS), a joint service of URSI, IAU and IUGG and a permanent service of the Federation of Astronomical and Geophysical and Data Analysis Services (FAGS). The local organization of the meeting was undertaken by IPS Radio and Space Services (Australian Government Department of Administrative Services). As with the earlier meetings in Boulder (1979) and Meudon (1984) the purpose of the meeting was to bring solar terrestrial physicists together with forecasters of solar terrestrial conditions and

the users of these forecasts to review current problems and requirements, and to plan for research for the years ahead.

The work of the meeting was conducted by three Working Groups: 'The Sun and Solar Wind', 'The Geomagnetic and Space Environment', and 'The Ionosphere'. These groups met either separately or in joint sessions to discuss problems of wider interest.

Key issues addressed by the 'Sun and Solar Wind' Working Group included: the nature, origin and prediction of the solar cycle; the evolution of solar regions; the prediction of solar activity such as solar flares and proton events; and the transmission of disturbances in the solar wind. A pleasing feature of the presentations to the Working Group was that the majority were directed towards providing tools to improve forecasts of solar terrestrial conditions.

The 'Geomagnetic and Space Environment' Working Group addressed problems such as: the relationship of geomagnetic disturbance to the solar wind; the effects of disturbances on terrestrial systems such as power lines and pipelines; the effects of disturbances on satellites; the use and meaning of disturbance indicators; and the use of persistence climatologies for improving forecasts. There were also presentations and discussion of the need for 'forecast validation' so that the effects of new knowledge on forecasts can be assessed objectively.

While many ionospheric services can be planned using conventional predictions, the Ionospheric Working Group preferred a broader approach. They accepted the idea that ionospheric predictions need to include all external energy sources such as magnetospheric and solar wind sources. Ionospheric problems identified at the 1984 Meudon Workshop remain unsolved. The group felt it was essential that close links should be developed between modelling and co-ordinated observational programmes if these problems are ever to be dealt with. While these ideas are not new, the current models are better and it was clear from the papers delivered that there is now a strong commitment to global and regional studies.

One of the key issues for the entire Workshop was the debate on the solar origins of disturbances. In an invited review, Prof. Tony Hewish (University of Cambridge) argued that all disturbances arrive from coronal hole regions in the southern atmosphere of the Sun and not from events such as solar flares. This claim was disputed by many scientists who stressed the role of coronal mass ejections as the origin of interplanetary disturbances. Despite this debate, there was general agreement that the interplanetary scintillation technique used by Hewish will form an important component of future disturbance forecasting. The meeting encouraged the development of such scintillation arrays in the United Kingdom, Japan, India and Australia.

A major burst of activity on the Sun during the meeting helped to emphasize the importance of the topic. The burst included a number of intense solar flares, and a strong ground-level proton event and a strong geomagnetic/ionospheric disturbance which affected ionospheric communications, navigation and other systems. The disturbance was accompanied by spectacular auroral displays seen over southern Australia.

Papers from the Workshop are being collected into a volume — *The Proceedings of the Workshop* — which will be available by the middle of 1990.

There was general agreement that these workshops play a valuable role and should be continued, with a shorter interval between meetings. IUWDS has accepted an offer by the Geological Survey of Canada to host the next Workshop in Ottawa during 1992. The meeting will prove an ideal opportunity to discuss the events of the next three years of what promises to be an extremely interesting solar cycle.

RICHARD THOMPSON

### **3rd International Conference on Palaeo-oceanography, St Johns College, Cambridge, 10–16 September 1989**

Palaeo-oceanography is a relatively young environmental science, created in the wake of plate tectonics and nurtured mainly by the ever-growing data base of the Deep Sea Drilling Project and Ocean Drilling Program over the past 20 years. That youth was reflected in the content and style of this conference. There were no parallel sessions: morning symposia, afternoon poster sessions and a single invited lecture each day were all packed, and debate was loud and long. Formality beyond that needed to avoid chaos was absent. In other words, this was the better kind of conference.

The Antarctic interest was considerable. Palaeo-oceanography of the Antarctic Ocean was the opening symposium, and 30 posters (15% of the total) had a dominant Southern Ocean flavour. The Antarctic symposium set the scene for the week, as all of the wide range of topics addressed came up again in later symposia, demonstrating the region's importance to global palaeoclimate.

Two symposium talks considered Pleistocene glacial–interglacial cyclicality: Carol Pudsey showed alternations between fast Antarctic Bottom Water flow during interglacials and slower flow during glacials, from grain-size measurements on Weddell Sea cores. Chris Charles demonstrated the power of stable isotope measurements on foraminifera from piston cores, to test models of atmospheric CO<sub>2</sub> regulation during glacials, and to delineate and describe Antarctic water masses. A longer term and continental view was Presented by David Harwood: while there is firm early Oligocene evidence of East Antarctic glaciers to sea level, marine diatoms and plants from the continental interior show more recent periods of higher sea level, and substantial warm-water incursions into interior basins in the late Miocene and early Pliocene. This considerable post-Oligocene variability of high latitude climate was supported by Rainer Gersonde's analysis of ODP Leg 118 diatoms. Within those same warm periods, low-latitude diatoms migrated into the Southern Ocean, in contrast with the isolation of the middle Miocene and the last 2.4 my.

John Barron reviewed ODP Leg 119 evidence for East Antarctic glaciation; notably, the question of late Eocene ice sheets in Prydz Bay remains open, pending better age control on key deposits. In a foretaste of the potential of stable isotope data from all four ODP Legs, Jim Zachos described a very different Paleogene Southern Ocean from today's, with strong, isolated subpolar gyres, and low-latitude production of bottom water, possibly dominant. Benthic foraminifera from Maud Rise, described by Ellen Thomas, include a short-lived early Paleocene low-oxygen assemblage which also argues low-latitude 'halothermal' bottom-water production, for at least that period. Brian Huber completed the symposium with an account of the Late Cretaceous Southern Ocean, already slowly cooling and partly isolated by weak oceanic fronts from warmer water to the north.

There is no space here to review the other symposia, or the Antarctic posters which, though individually more closely focussed than the symposium papers, reflect in aggregate a continuing, broad and vigorous research effort which bodes well for the future. The abstracts for this conference are published in *Terra Abstracts* 1 (2 — Third International Conference on Palaeo-oceanography). The fourth ICP will be held in the Federal Republic of Germany in 1992.

P.F. BARKER