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Recent meetings

Fifth SCAR Biology Symposium, Hobart, September 1988

The first two symposia on Antarctic biology were general meetings with no specific focus. In those days biological research was fairly limited in extent. By the time of the Washington symposium in 1974 this was no longer so and for this and the following meetings themes were chosen to give a clear direction. The themes are expected to reflect topics of current importance in Antarctic science and it is in this context that the title for the Hobart symposium 'Ecological change and Conservation' must be viewed.

The range of contributions was very wide and split almost 50/50 between posters and oral presentations. A total of 250 papers were offered to the organizers of the symposium, of which 167 were accepted. Eighty papers were scheduled for oral presentation and this made the programme very crowded. The organizers tried hard to fit as many as possible into the principal themes but by the end of the symposium it was clear that less than 50% of the contributions actually addressed the principal subjects. Marine papers dominated the meeting, with only 25% of the contributions dealing with terrestrial and freshwater ecosystems. In terms of organisms 54 contributions dealt with microbes and invertebrates (of which 16 were on krill), 33 were on plants, 27 on birds, 23 on mammals and 18 on fish. There was little evidence of studies on intertidal or subtidal organisms. If there seemed to be a slightly more coherent structure amongst the marine contributions than the terrestrial and freshwater material, this might be a reflection of the pervasive influence of the BIOMASS programme. Perhaps it could also be ascribed in part to the greater heterogeneity of the terrestrial system in comparison to the marine. Despite this the terrestrial and freshwater papers were disproportionately better at addressing the symposium theme than the marine papers.

During the week a number of common ideas became apparent, regardless of discipline. The value of long-term observations was stressed again and again for both marine and terrestrial ecosystems. The importance of systematic and well-organized monitoring programmes was underlined as the most effective method for detecting the onset and direction of significant changes in biological populations. What was not clear was a concensus on what should be monitored, how and for how long. Despite their scientific importance both of these activities were recognized as difficult to fund on a continuing basis. Conservation was seen as a field of growing importance in which active management would require much more data than is presently available for most systems. There was perceived to be great potential for improvements in both data management and data dissemination.

In the brief summaries at the end of the meeting Horner, Bengston, Walton, Hubold and Hempel all tried to highlight dominant sub-themes and point to questions for the future. The importance of the sea-ice biota is now clearly established but much more winter data from within the pack ice are needed. Difficulties remain in accurately characterizing the microhabitats within the ice and modelling this extremely dynamic system. In the Southern Ocean much remains to be done on the interaction between sea ice and plankton, on the current extent and distribution of particle flux and, despite the extent of current studies, on the ecology and behaviour of krill, especially when swarming. In contrast, studies of the mechanism of cold adaptation in marine organisms (although not strictly within the symposium theme) are alive and well and breaking interesting new scientific ground. The preliminary studies of El-Sayed on the effects of increased UV on plankton are an indication of a rapid research response in a topical and potentially significant field.

In a more general context the lack of an adequate taxonomic treatment for many groups was noted, whilst the poor state of soil science studies suggests many interesting opportunities are being missed for fundamental research on primitive soils. In the terrestrial and freshwater ecosystems little was known about the numbers of successful immigrants nor even about the reproductive success of established species. The synthesis of various forms of data showed considerable potential in the field of Quaternary studies at particular sites but much of the ecological work was difficult with the present inadequate taxonomy for many groups.

Technological developments were seen as an important feature of future studies in several fields. For recording activities away from land in mammals and birds as well as features of their physiological performance sophisticated electronic devices will be necessary. Increased availability and discrimination in data from remote-sensing systems will be critical in many marine investigations in the next decade, whilst on land the employment of the latest techniques will be essential to address difficult questions of genetic variability and physiological functioning at sub-zero temperatures.

A remarkably small number of drop-outs left the programme rather too full for easy digestion, despite an early start each day and the need, for the first time at a SCAR Biology Symposium, for one concurrent session. Especially noteworthy was the quality of many of the posters, which formed a major part of this meeting. Much less agreeable, despite the advice provided to all speakers by the organizers, was the appalling quality of the slides and overheads in a small number of the oral presentations. These made no useful contribution to the exchange of scientific information.

Despite the busy programme there was time for a welcome

visit to Mount Field to see typical Tasmanian vegetation and a platypus swimming in the lake. The terrestrial biologists found time for a BIOTAS meeting to discuss the future development of an international collaborative programme, whilst the krill biologists met for informal discussions on future priorities.

The organizers, led by Knowles Kerry, are to be warmly congratulated on their efforts. It was unfortunate that the necessity for housing delegates in widely separated accommodation militated against the informal evening discussions which were such a feature of the Wilderness meeting. It seems certain that the next symposium will need to be structured differently to allow for more adequate treatment of what are certain to be an even larger number of contributions.

In terms of numbers of international participants, papers and posters it was very clear that this was the most successful biology symposium so far. There were almost 200 participants from 19 countries. Obviously the largest group were from Australia but considerable numbers also came from the USA, UK, New Zealand, South Africa and Federal Republic of Germany. It was unfortunate that there were no scientists from the USSR and the German Democratic Republic, both of which have active biological programmes.

Should we be worried that polar science could be becoming an exclusive area, not well connected with discipline-oriented areas outside? Are Antarctic biologists inward-looking and out of touch? The evidence from this meeting is that Antarctic biology can be seen to be leading the world in some areas of science and providing much needed comparative information to others. Antarctic biologists are increasingly incorporated into global international programmes and there was much talk at Hobart of the SCAR contribution to the proposed International Geosphere–Biosphere Programme.

Hobart has demonstrated that Antarctic biology is alive, well and flourishing with a wide range of active programmes. An increasing interest in interdisciplinary research and a tendency towards team work are part of a pattern visible in other fields of science. We can look forward to continuing growth in Antarctic biology with a more general realization by non-polar biologists that polar science is now as developed, sophisticated and significant as studies elsewhere in the world.

D.W.H. Walton
W.R. Siegfried

Colloquium: Human Factors Research in Antarctica, Hobart, September 1988

During the 20th meeting of SCAR in Hobart in September 1988, Dr D.J. Lugg (Chairman of the Working Group on Human Biology and Medicine) in association with Professor H.K. Muller (Faculty of Medicine, University of Tasmania) organized a well-attended three-day colloquium on 'Human Factors Research in Antarctica'.

The introductory lecture by Professor Masterton traced modern polar human biology from the British North Greenland Expedition (1952–54). Following this there were accounts of the current studies being undertaken by Argentina, Australia, Chile, China, France, New Zealand, the United Kingdom and the USA. These accounts showed advanced occupational health thinking in most of the nations involved, and there was much common ground. The afternoon was devoted initially to medical screening and practice, together with the beginnings of epidemiological, occupational and public health work. Dr Peter Gormly and Lieutenant Commander Ker Boyce gave particularly detailed accounts of the screening work undertaken in Australia and the USA, respectively, while Dr Claude Bachelard presented his extensive studies on accidents on the French bases. This was followed by a very topical session chaired by Dr Michele Raney on women and families in the Antarctic.

The remainder of the Colloquium was devoted to the reporting of current research work and to the planning of future work. Dr Larry Palinka's studies of long-term effects of Antarctica on health and performance led to much discussion and had relevance to the sessions on endocrine studies, the cardio-vascular consequences of Antarctic life and the considerable section on polar psychology where the question of selection procedures received particular attention. Other topical areas discussed included microbiology and immunology, with some interesting examples on the transfer of bacteria and viruses around Antarctic communities by Dr Scott Cameron, and the effects of the ozone 'hole' on the health of the Antarctic community, with presentations by Professor Ed de Fabo and Dr Colin Roy.

Dr Jens Hart Hansen, the Chairman of the International Union for Circumpolar Health (IUCH) made a plea for more collaboration between the Antarctic and the Arctic in health care. The next meeting of IUCH in 1990 should contain a major session on Antarctic biomedical problems. There were also presentations on the analogous problems encountered in space. This session was chaired by Professor Chet Pierce, and Professor Rivolier pointed out the interest of the European Space Agency in collaborative work in the Antarctic, in addition to the interest of NASA.

The final task of the Colloquium was to identify areas for future research and a plea was made for more international collaboration and the establishment of larger data bases so that meaningful conclusions could be drawn earlier. There was general recognition that the human research potential of the Antarctic lay in the recognition that each polar community was a unique group of fit, healthy, young people subject to the same environment, diet, activity etc., forming an ideal population for studies on hormone chemistry, nutrition, microbiology, etc. The value of the Antarctic as an analogue

for space research was emphasized. Ethical problems in developing Antarctic medical research were touched upon and it became clear that greater integration and comparison with on-going arctic studies was desirable. The special importance of microbiology was also underlined and the possible problem of spontaneous virus development raised.

The Colloquium showed that there was considerable interest and vitality in the present range of Antarctic biomedical studies. It is to be hoped that this resurgence of interest on an international scale, ably led by the examples of Australia and France, will encourage much greater activity in this field over the next decade.

J.N. NORMAN

Meetings on Upper Atmospheric Physics, Hobart, September 1988

A Workshop on 'Recent results in ionospheric and magnetospheric physics' consisted of four half-day sessions, with another half-day session being devoted to a Symposium on 'Ozone and other trace constituents in the Antarctic middle atmosphere', the meetings being attended by up to 50 scientists from around the world. There were seven invited review papers and 34 contributed papers. Some of these are being submitted to *Planetary and Space Science* for publication as a special issue in in 1989.

Significant recent progress on the interpretation of auroral emissions, on electric fields, on magnetospheric whistler-mode studies and on upper atmosphere dynamics was reported. Reviews of the observational evidence for, and the theoretical explanations of, the springtime depletion of ozone over Antarctica provided a lively session.

An afternoon session was devoted to an informal discussion of what is needed, in the way of new experimental observations, on stratospheric ozone and other trace species. Particular attention was paid to intercomparisons between different techniques and to relationships with features of stratospheric dynamics. The difficulty of developing a comprehensive numerical and chemical model of the Antarctic stratosphere was emphasized.

Another session considered plans for the development and the future deployment of new facilites on the continent. Antarctic Geophysical Observatories (AGOs) could be particularly beneficial. The measurements necessary and the siting of the AGOs themselves need to be matched to the research requirements for Antarctic data during major international programmes in solar-terrestrial physics planned for the 1990s. The idea of establishing an international data base was floated. Another possibility for a new facility would be a second-generation transmitter of whistler-mode radio signals to diagnose the magnetospheric plasma distribution and to trigger the precipitation of energetic charged particles.

A Workshop was held on Antarctic data collected during January 1986, when balloon-borne electric field and X-ray bremsstrahlung measurements were made from the South Pole.

M.J. RYCROFT

SCAR Working Group on Geodesy and Geographic Information, Hobart, September 1988

The initial session of the Working Group on Geodesy and Cartography considered its changing role and function within SCAR. With the increasing demand for the instigation of a Geographic Information System (GIS) of Antarctica and the resulting need for a common geodetic reference system, presentational standards and agreed data base structures to facilitate interdisciplinary and international data exchange, it was concluded that the primary responsibility of the Working Group should be to provide an homogeneous ground-related spatial framework for specialized information systems developed by other SCAR Working Groups. It was suggested that the group's name should be changed accordingly, to the Working Group on Geodesy and Geographic Information, and this change was approved by SCAR.

A one-day symposium on Modern Geodesy and Cartography in Antarctic' was attended by 40 people. Six international papers were presented which focussed on historical cartography, and such recent developments in the mapping of Antarctica as the application of satellite imagery, remote sensing, the use of satellite positioning systems and digital mapping. The symposium papers emphasized the need for crustal movement monitoring surveys and the importance of digital space imagery for mapping. The Working Group also tabled the revised edition (September 1988) of the SCAR Antarctic Catalogue of Maps and Charts.

J. MANNING

Third Symposium on Invertebrate and Plant Cold Hardiness, Cambridge, 17–22 July 1988

The meeting was attended by 70 researchers in the field of cryobiology from 12 countries. The single session format with lengthy discussions was especially valuable in this mixed gathering of physiologists, biochemists and ecologists.

Six papers and posters on Antarctic organisms were presented at the meeting. The three on plants dealt with lipid content and fatty acid desaturation in a chilling resistant phanerogam on Kerguelen *(Pringlea antiscorbutica)* (Dorne,

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Joyard & Douce), the effects of extra-cellular freezing on filamentous chlorophytes on Signy Island (Hawes), and the resistance of algal-cyanobacterial crusts to disruption by frost heave (Wynn-Williams). The three contributions on Antarctic invertebrates reported on the survival of freezing by an introduced midge *(Eretmoptera murphyi)* (Harrisson & Block), low temperature adaptation in fellfield protozoa (Hughes & Smith), and cold tolerance and survival in two species of nematodes (Pickup).

In addition to these specifically polar papers there were more wide-ranging review papers on adaptations in alpine invertebrates, the physico-chemical aspects of freezing in biological systems, haemolymph nucleators, biochemical mechanisms of cryoprotection, plasma membrane changes in the cold acclimation of plants, and the relationships between field survival and laboratory determinations of cold hardiness in invertebrates.

The amended abstracts will be published in *Cryo-Letters* **9** (6) (1988). The next symposium will be at Binghamton, USA in 1990.

W.C. Block

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