

Chapter 5

The Environmental Years (1988-97)

Yet more new members

During this decade the membership of SCAR suddenly increased. Much of this was linked to the enthusiasm of countries to become Consultative Treaty Parties so that they could take part in any minerals development. The quest for consultative status required proof of significant scientific research and how better to do this than through SCAR. Finland, Ecuador, Colombia, Pakistan, Estonia, Canada, Ukraine and Bulgaria all joined as Associates whilst Sweden, Italy, Uruguay, Spain, Netherlands, Korea (South), Finland, and Ecuador all became Full Members. This not only had a major effect on the Delegates' Meetings and the attendance at the Working Groups but the extra subscriptions were a very welcome addition to the SCAR finances. As always the Secretariat was endlessly chasing some countries for unpaid subscriptions and finally, in the case of Colombia, it was recognized that the funds would never be paid and the country left SCAR, pleading lack of cash rather than lack of interest.

It was during this period that the International Arctic Science Committee (IASC) was established. For the first time there was a potential counterpart for SCAR in the Arctic, even though its original establishment came about in a quite different way and IASC was not part of ICSU. The changes in the geopolitics of the Arctic engendered by President Mikhail Gorbachev began with the ideas of perestroika and a new interest in the Soviet Union in establishing bilateral agree-

ments for Arctic collaboration. Canada and Norway quickly began talks with the Soviets that stimulated others to consider how this could be broadened. The foundations of IASC began with discussions at the SCAR San Diego meeting in 1986 where Jim Zumberge, Odd Rogne and Fred Roots called a lunchtime meeting about how to develop circum-arctic research co-operation, and capitalize on the cessation of the Cold War. Their conclusions were that this was an important opportunity and they should begin with the Arctic countries listed for bilaterals with the Soviet Union as the core group. Rogne already had experience of negotiating with the Russians and good high level connections in Moscow so he agreed to organize the first planning meeting in Oslo in February 1987 which was attended by representatives of all the eight Arctic Rim countries (Canada, Denmark, Finland, Iceland, Norway, Sweden, USA, USSR). These representatives came from the principal polar organizations in each country. Political sensitivity slowed progress in some quarters but the initial planning documents are believed to have provided a key initiative for the change in policy by the Soviet Union announced by Gorbachev in his speech in Murmansk on 1 October 1987 as parts of his speech were identical to parts of the planning documents for IASC. By the time of the first meeting in Resolute Bay, Canada on 28 August 1990 a set of Founding Articles had been agreed that satisfied the politicians of the Rim countries and would allow scientists from countries other than

the original eight to take part. It began work quickly with its secretariat established in Oslo and the inclusion of non-Arctic countries like France, Germany, UK and Japan (as second tier members) in its deliberations. Not surprisingly some of the same people were active in IASC as were active in SCAR and this informal conduit provided a linkage between the two organizations in the early years. IASC finally joined ICSU as an Associate Member in 2005. By 2010 IASC had now grown to include 18 countries

At XX SCAR in Hobart, Australia, during September 1988, the Delegates took two major decisions that were to affect SCAR far into the future. The Working Group on Logistics would be closed and succeeded by a Standing Committee on Antarctic Logistics and Operations (SCALOP) under a Council of Managers of National Antarctic Programmes (COMNAP) and the Sub-committee on Conservation of the Working Group on Biology would be replaced by a Group of Specialists on Environmental Affairs and Conservation.

The establishment of COMNAP and SCALOP

The ball was rolling rapidly towards an independent body for managers and logisticians.

David Drewry was able to attend the SCAR Executive in March 1988 to represent the managers and agreement was reached that a new Council of Operations Managers would replace the Logistics WG, and that its chairman would become part of the Executive. There were even some very general draft Terms of Reference formulated. The SCAR Executive was thus able to recommend the establishment of a Council of Operations Managers, an announcement met with dismay by those who were not privy to the detailed discussions. The next meeting was held at XX SCAR in September 1988 in Hobart where Brazil circulated a document stating its objection to the separation of the managers' group from SCAR. In the event, Jim Zumberge per-

suaded Tony Rocha-Campos, the Brazilian Delegate, to withdraw the objection as a personal favour to him because this was of political importance for the United States. The managers and the Working Group met together under the chairmanship of Jim Bleasel to develop their initiative and tried to work out how the new relationship would work with SCAR. All 22 National Programmes were represented. The Working Group considered the reasons for establishing the Managers Group were:

- a. To exchange information on those operational items or matters which have budgeting or operational significance and so to learn from the successes or failures of others.
- b. To exchange information on, and resolve, joint operational problems.
- c. To participate, with appropriate scientists, in discussions of proposed scientific projects requiring major international collaboration or large-scale operational support so as to determine their nation's resources for such projects.
- d. To establish personal contacts so that in the event of any emergency requiring it, international collaboration can be achieved more rapidly and efficiently.
- e. to facilitate responses to requests from ATCMs directed to "national Antarctic operating agencies".

On the proposal to take this forward there were no dissenting countries and COMNAP was formally born on 15 September 1988. The meeting then agreed unanimously that Alfred N Fowler should be appointed part time Executive Secretary to the new Council upon his retirement from the National Science Foundation, with an office at the American Geophysical Union. Not surprisingly, in the light of the efforts Wilkniss had put into this, OPP agreed to fund this part-time position during the early years of the Council. The Terms of Reference for the Council of MNAPs were agreed (while noting that

the group cannot make decisions that are binding on governments):

1. To establish a Council of MNAPs, federated to SCAR.
2. To review, on a regular basis, operational matters and to exchange information.
3. To examine, discuss and seek possible solutions to common operational problems.
4. To provide a forum for discussion in order to frame better, and in a timely, efficient and harmonious manner:
 - (i) national responses to common issues directed to National Antarctic Operators,
 - (ii) appropriate input to SCAR responses to questions involving science and operations/logistics.
5. To review, with appropriate SCAR WGs and Groups of Specialists, projected programmes requiring major international collaboration on operations/logistics and to provide appropriate advice to the SCAR Executive.
6. To respond to requests by SCAR for information, advice and comment.
7. To create sub-groups as necessary, of which one will be a Standing Committee on Antarctic Logistics and Operations (SCALOP) and which will replace the SCAR Logistics Working Group upon its termination.
8. Copies of all written outputs of the Council of MNAPs, and its sub-groups, to be passed to the SCAR Secretariat.

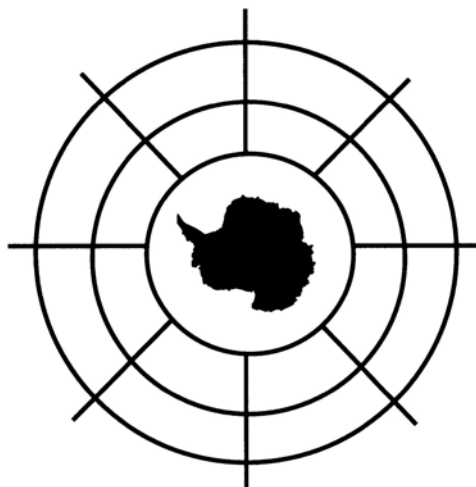
The Terms of Reference for SCALOP were as follows:

1. To serve SCAR by providing advice on Antarctic operations and logistics.
2. To investigate and, if necessary, arrange for research on operational problems identified by the Council of MNAPs or by SCAR and its Working Groups.

3. To establish *ad hoc* groups of experts to discuss and to foster advances in technology.
4. To hold symposia and expositions to inform of and review technological advances.
5. To exchange timely information on Antarctic logistics and operations.

One of the key elements here was deciding who should be the first Chairs of COMNAP and SCALOP. There was general agreement that David Drewry from the UK would make an excellent first Chair but Argentina was unhappy. The way forward was found over a lunch called by Odd Rogne where Carlos Rinaldi and Drewry agreed a way forward that would be acceptable to the Argentine politicians. Drewry was to be appointed for one year only. Much less contentious was the election of Heinz Kohnen (Germany) as the Chairman of SCALOP. The relationship with SCAR was solved by declaring that COMNAP was “federated to SCAR” but without defining exactly what this meant. The break had apparently been amicable but would the new organization really be more effective now that it was outside SCAR?

The first formal meetings of COMNAP and SCALOP were held in Cambridge, UK, 5–6 October 1989. David Drewry (then



The COMNAP logo adopted by the Council of Managers of National Antarctic Programmes.

Director of the British Antarctic Survey) chaired the meeting of COMNAP. Since at the meeting it was agreed that the elected Chairman should serve a two- or three-year term of office, despite reservations from Argentina, Drewry was re-elected to serve until the end of the annual meeting in 1991. Other agenda items discussed included: air operations; environmental protection and management; tourism and non-governmental activities; forthcoming large-scale international science programmes; telecommunications and status of relevant ATCM Recommendations. SCALOP met in parallel with COMNAP under the chairmanship of Heinz Kohnen (Alfred-Wegener-Institut für Polar- und Meeresforschung) who had been elected Chairman for a 4-year term. Topics discussed included: avoidance of duplication between COMNAP and SCALOP; current engineering projects; air operations; waste management and the environment. A sub-group was formed to develop a standardized format for waste management plans. The Chairman of SCALOP reported on the meeting to the plenary session of COMNAP.

The relationship between SCAR and the emerging COMNAP was a source of concern and confusion at this time. There was a continuous worry in SCAR that COMNAP would go its own way and sideline SCAR. But clearly many managers reflected on what their role was - to support science which was co-ordinated internationally through SCAR - so a *modus vivendi* was essential. How could an amicable and meaningful articulation be achieved? The old Logistics WG had been a component of SCAR and many in SCAR believed that COMNAP should be similarly organized - ie. a large, influential body BUT within SCAR. But with Peter Wilkniss and Jim Bleasel insisting that the managers could not be subordinate to SCAR there appeared to be a stalemate. There were endless draft documents prepared - mainly organograms which attempted to create a relationship between the two - but most were consigned to the waste paper basket as they failed to meet the

strongly held views on both sides. How then to achieve an amicable and workable relationship. The idea of "federation" was Drewry's, based on the fact that many of the countries affiliated to SCAR were federal states and therefore understood the relationships, dependence and dynamic between component states - or they thought they knew! That was the trick and almost everybody could therefore agree that "federation" had the right blend of both independence and association. So it was put to both SCAR and to COMNAP by Drewry at their Executive meetings. Many Delegates within SCAR expressed concern at this new development but were clearly powerless to stop it.

There was also concern that, although COMNAP had no funds of its own at that point, the managers had access to millions of dollars whereas SCAR's annual income was about US \$250,000. Perhaps, suggested some, this would allow COMNAP to directly compete with SCAR to provide advice to the Treaty, being able to fund crucial meetings or workshops more easily than SCAR. This could push SCAR to the sidelines and might then lead, in turn, to future requests being directed to COMNAP rather than SCAR. However, the die had been cast and the separation was complete.

The SCAR Executive met in Zurich in June 1991 and felt that it was essential to strengthen the relationship between SCAR and the new COMNAP. They agreed that the Chairman of COMNAP should be an *ex-officio* non-voting Delegate at SCAR's biennial meetings. The Chairman of SCALOP would be accorded the same status as Chief Officers. COMNAP had made reciprocal arrangements for the President of SCAR.

During the early years of COMNAP the relationship between SCAR and COMNAP was often, at best, wary and, at worst, distrustful. In a way this was hardly surprising. Most members of COMNAP were government servants wholly employed in Antarctic programme management

whereas the majority of SCAR scientists were based in universities or other non-Antarctic organizations who worked for SCAR in their own time or with the permission of their superiors, a permission that was often given only grudgingly. As a result, COMNAP could gather information and develop policy far faster than SCAR. Perhaps the real problem was that SCAR perceived that the managers wanted to distance themselves from SCAR because they wanted a power base from which to operate, something they had never had while they were a Working Group within SCAR. The election of David Drewry as the first chairman was considered to be helpful in creating an appropriate and positive articulation between the two organizations; Drewry was well-known as an Antarctic scientist, was serving as a SCAR Alternate Delegate as well as being the head of a national programme.

Over the years the relationship between SCAR and COMNAP has improved to the point where they now generally work much better together, particularly in providing advice to the Antarctic Treaty where the demarcation of expertise and responsibilities is normally very clear. COMNAP meets annually and its meetings in even-numbered years are held during the first week of the biennial SCAR meeting thereby providing an opportunity for the two Executive Committees to hold a joint meeting. Initially, in the odd-numbered years, the SCAR Executive Committee invited the Chairman of COMNAP to attend the Executive meeting. Since 1997, at the IX COMNAP meeting in Cape Town, South Africa, the SCAR Executive Committee has held its meeting alongside the COMNAP meeting in the odd-numbered years that has also provided the opportunity for a joint meeting of the Executive Committees. These joint meetings are invariably short, due to the time constraints of the main meetings, and have not always been as productive as might be expected. However, away from the meetings and at a practical level, there is regular electronic contact between the two secretariats, SCAR in

Cambridge, United Kingdom, and COMNAP, previously in Hobart, Australia and now in Christchurch, New Zealand.

Environmental initiatives

The Working Group on Biology had had a subcommittee on conservation almost since the beginning of SCAR, and from September 1974 it had been under the chairmanship of Nigel Bonner. The growing importance of conservation and environmental management at the Treaty had already been recognized by SCAR and, realizing that SCAR could contribute a great deal more in these fields, it was agreed that a more focused group was needed to generate the expert approach needed. At the XX SCAR Meeting in Hobart, Australia, September 1988, the Delegates agreed to establish the Group of Specialists on Environmental Affairs and Conservation (GOSEAC). Its membership was agreed by the Executive in Siena in 1989: Nigel Bonner (chairman), Rudolph Bannasch, Peter J Barrett, Krzysztof Birkenmajer, Pat Condy, Victor Gallardo, Marcello A Keller, Ronald I Lewis Smith, Hugh F M Logan, Paul Trehen and José Valencia. Its first meeting was held in Cambridge, United Kingdom, during September 1989.

The choice of a Group of Specialists, as opposed to a new Working Group, had its advantages and disadvantages. The principal advantage was that SCAR would appoint the members and the membership could be restricted. However, the latter advantage also meant that SCAR would have to pay the travel and subsistence costs for the members to attend meetings, a substantial item in the SCAR budget. Another advantage was that all the members were appointed for their expertise so that the group as a whole could cover the range of topics required. If there were any gaps in expertise for the agenda of a particular meeting the Convenor could co-opt additional members for that meeting. The fact that members were appointed as individual experts, not as representatives of a national SCAR member, meant that opinions could be



First meeting of the Group of Specialists on Environmental Affairs and Conservation (GOSEAC) held at the British Antarctic Survey, Cambridge, United Kingdom, 11–14 September 1989. Standing (left to right): Pat Richmond (SCAR Secretariat), Paul Trehen, Victor Gallardo, Marcello Keller, José Valencia, Pat Condy, Ron Lewis Smith. Seated (left to right): Rudolph Bannasch, Krzysztof Birkenmajer, Peter Clarkson (SCAR Executive Secretary), Nigel Bonner (Convenor), David Walton, Sherburne Abbott.

expressed and decisions made on purely scientific grounds without having to accommodate national stances, an important consideration in what was rapidly becoming a contentious field. A Working Group with national representatives could not have reached conclusions in this way. In addition, if National Committees had appointed the representatives to the group it would have been highly unlikely that the required range of expertise would have been covered.

GOSEAC started as a Group of Specialists with a difference. Most Groups of Specialists had a limited life, normally up to 10 years, during which they would be expected to address a particular scientific problem. This usually meant co-ordinating a research programme to which many SCAR scientists from several countries would contribute. GOSEAC would have no such research programme but would be developing advice to SCAR on various environmental and conservation matters. This advice would then be passed on by SCAR to the relevant organizations. In practice, most of the work undertaken and advice provided by GOSEAC was in

relation to matters put to SCAR by successive ATCMs. The only other long-term Group of Specialists was the Group of Specialists on Seals whose remit included providing scientific advice to the Convention for the Conservation of Antarctic Seals (CCAS) under the Antarctic Treaty.

GOSEAC proved to be controversial from the start. There was a great deal of business to be managed and on a strict timetable to allow SCAR to present the findings of the Group in papers to the ATCM. Unlike some of the other groups of specialists that welcomed anyone to join them GOSEAC operated differently with closed meetings of the sort originally envisaged for such groups. The expertise on the Group was carefully selected from a range of scientific disciplines and included a member of SCALOP right from the start, thus joining COMNAP to SCAR in these discussions. As members changed an environmental officer was added, linking GOSEAC to the Antarctic Environmental Officers Network (AEON), and it was made very clear at all of its meetings that members were there *ad*

hominem, and national positions were not admissible. This approach was seen by some as provocative and many attempts were made to allow the size of the group to be widened beyond the 10 agreed so that countries could appoint “national representatives”, a move determinedly resisted by the SCAR Executive. They did, however, agree that National Committees could appoint Corresponding Members to any Group of Specialists and that the Convenor could invite specific observers along as he saw fit. One of the idiosyncrasies of GOSEAC, adopted from the start, was that the members were expected to host meetings of the group in turn. This allowed the group to meet around the world without putting a particular burden on any one country.

GOSEAC provided a driving force for SCAR involvement in new conservation and management issues. The basic thesis was that good environmental management could only be based on good science. The range of subjects covered was very wide - from management plans for protected areas to the operation of incinerators, from the production of manuals for monitoring human impacts to a checklist for environmental inspections, from the toxicity of de-icer to marine acoustics and mammals. In many of these initiatives workshops were organized jointly with COMNAP and the reports and papers were often also joint productions. The impact of all this was considerable at an international level.



Members of GOSEAC enjoying the mudflats of the Waddensee on an excursion during the GOSEAC IX meeting in Bremerhaven, Germany, July 1999.

David Walton took over as Convenor in 1993 from Nigel Bonner at the GOSEAC meeting in Gorizia, a move not universally welcomed as some other countries believed that a change in the nationality of the convenor was required and had particular agendas they wished to push.

GOSEAC set up a close link to IUCN through Paul Dingwall in New Zealand which resulted in three co-sponsored workshops on Antarctic Protected Areas, Research and Management of the Subantarctic Islands and Antarctic Environmental Education and Training. The workshop reports were published by IUCN and provided important syntheses for the protected areas and subantarctic islands whilst breaking new ground on education by developing this as an agenda item for discussion at the ATCM.

Until the Protocol on Environmental Protection to the Antarctic Treaty was ratified by all the Consultative Parties in 1998 none of its elements could be legally acted upon. Afraid that this would set environmental management back by years the Parties decided to establish a “Transitional Environmental Working Group (TEWG)” which, whilst it had no legal standing, could work to put in place the foundations for the Committee for Environmental Protection. From the start many of the national delegations at the TEWG were inadequately provided with experts yet major subjects were under discussion and development. SCAR was the only body with a sufficiently broad expertise to provide the data for many of these discussions and GOSEAC found itself undertaking detailed work for the TEWG simply to ensure that the long term interests of science were protected.

One of the regular tasks for GOSEAC at its annual meetings was to review the draft management plans for protected areas in Antarctica that would be tabled at the ATCM for adoption as Sites of Special Scientific Interest (SSSIs) or Specially Protected Areas (SPAs) and subsequently as Antarctic Specially Protected Areas (ASPAs). Many of these draft plans submitted by National Committees

had limited scientific arguments, were poorly constructed, poorly written and with inadequate maps. These were to be granted key status as international legal documents with which all scientists would have to work. The group felt it essential that they should meet not only all the scientific requirements but also those of usability in the field and would often spend considerable efforts re-working a single plan before returning it to the originator for final revision. GOSEAC members were often very familiar with the areas to be protected which made a considerable difference to the revisions. In later years, once the Committee for Environmental Protection (CEP) was operational at the ATCM, SCAR was told to restrict its review of these plans to scientific matters only; the CEP would deal with all other aspects. A lack of familiarity with the areas designated together with little time for revision in a lengthy agenda led to the adoption by the ATCM of a number of less satisfactory management plans, although they contained satisfactory science.

The Terms of Reference for GOSEAC were defined and redefined by the SCAR Delegates but they still left room for interpretation. As a result the Convenors, first Nigel Bonner and subsequently David Walton, would pick up various matters for discussion that some Delegates felt were actually outside GOSEAC's remit. Such matters created critical discussions among Delegates when the Convenor presented his report and gave rise to far more vituperative remarks in the corridors. However, these were matters of importance to SCAR and, because they were not relevant to any other SCAR groups, the GOSEAC Convenors felt justified in considering them. Some Delegates were undoubtedly aggrieved by some of the GOSEAC advice because it did not accord with their national positions. They felt that GOSEAC should be a Working Group so that their national positions could be aired and accommodated. Despite these criticisms, GOSEAC continued with its work and survived attempts to "clip its wings".

Gradually, as the ATCM increased the number and extent of requests to SCAR for advice on environmental matters, the GOSEAC workload grew and the annual meetings became a week of feverish activity to complete the agenda. At the same time, several Delegates began to realize the amount of work that the group was doing on their behalf and their disposition towards GOSEAC moderated. Eventually, the wheel turned full circle and when the group was closed with the implementation of the recommendations of the SCAR Review one prominent Delegate, who had been one of GOSEAC's most vociferous critics, remarked that he did not know what SCAR would do in the future without a group like GOSEAC.

At XVI ATCM in 1991 the Delegates proposed to hold a First Meeting of Experts on Environmental Monitoring. In preparation for this the SCAR Executive convened an *ad hoc* Group on Environmental Monitoring that met in Cambridge, 24-26 February 1992. A paper was developed and the Executive Secretary took this to a meeting of the COMNAP subgroup on Environmental Monitoring in Washington DC, 2-5 March 1992. A separate COMNAP paper was prepared. At the meeting in Paimpont, France, 22-25 April 1992, the two papers were amalgamated into a single document that was then approved by both Executive Committees for joint submission as a discussion document for the Meeting of Experts, held in Buenos Aires, 1-4 June 1992. R M Laws (President), W N Bonner (Convenor of GOSEAC) and the Executive Secretary represented SCAR at the meeting. The document entitled "A scientific framework for environmental monitoring in Antarctica" was the only paper tabled for the meeting! The collective experience of the Antarctic environment of the representatives around the table was very largely vested in the SCAR delegation. After several hours of discussion, one national representative proposed taking the document and re-working it to form the report of the meeting. This was strongly rebuffed by another representative who stressed that

this Meeting of Experts had to develop its own advice to present to the next ATCM. The resulting report was indeed developed by the meeting but it was peppered with sentences and sections lifted from the SCAR/COMNAP document!

Relations with the Antarctic Treaty

At XII ATCM there had been discussion of the value both of having non-consultative Parties present at every meeting and inviting specific international organizations to attend where their expertise would help the discussions. At XIII ATCM in 1985 this was developed further by a resolution (XIII-2) that required reports from SCAR and CCAMLR at the next meeting, thus laying the basis for their regular attendance.

At XIV ATCM the Rules of Procedure were revised and both the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and SCAR were formally given the status of "Observers". This status entitled the Chairman of CCAMLR and the President of SCAR, or their appointed representatives, to attend the meeting and to submit written papers to the meeting as Working and Information Papers. However, the Chairman of CCAMLR and the President of SCAR could apparently only speak from the CCAMLR and SCAR desks during the relevant agenda items; they would have to spend the rest of the meeting with their national delegations, a ridiculous solution. Other international organizations, initially the World Meteorological Organization (WMO) and the International Union for the Conservation of Nature (IUCN) were regarded as Experts and could be invited to send a representative to assist with discussions on specific agenda items. Experts were allowed to submit Information Papers only. Both Observers and Experts could be excluded from the plenary if required. At this meeting the Delegates agreed Rec XVI-2 on the need to develop environmental impact assessment procedures for activities on the continent. Confusingly SCAR was also listed as an Expert in the final report

because of the attendance of Jim Bleasel (at the request of XIII ATCM) to address the specific topic of air safety.

For the XV ATCM in Paris, France, October 1989, Claude Lorius, as a leading figure in French Antarctic affairs, was closely involved with the French Government's organization of the Treaty Meeting. Lorius felt the time had come to make a more substantive mark for SCAR and suggested that he give an illustrated lecture to the plenary on SCAR science. Not only was this accepted and included in the programme but its novelty for many of the Delegates, as well as the way Lorius delivered the talk, won plaudits all round. The SCAR Executive had also agreed that, given the increasing emphasis on environmental affairs, Lorius should be accompanied by a specialist in the field and Nigel Bonner, Convenor of GOSEAC, was asked to go. Both were listed for the first time under SCAR as an official Observer delegation. SCAR had finally taken its place at the Treaty Meetings after only 28 years but its members were still supposed to scurry back to their national delegations when not speaking on an agenda item!

Many Antarctic scientists had had considerable misgivings about the negotiations for a minerals regime in the Antarctic. The conclusion of the negotiations and the formal signing ceremony of the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) was in Wellington on 2 June 1988. ASOC and Greenpeace were bitterly opposed to the Convention and had vowed to fight it tooth and nail from the start of the negotiations. SCAR was equivocal in that it had provided several important reports to the Treaty dealing with mineral resources and their possible exploitation, and many of its scientists had been involved in the negotiations as experts within their national delegations. The Delegates at XX SCAR had decided that SCAR should seek Observer status on the Commission and on the Advisory Committee and recognized that implementation of the Convention would enhance the need for scientific research. The final text was

very strong on environmental constraints and, given that any Party could object to a development, it did seem unlikely that the agreement had opened the door to an exploitation bonanza as some had claimed. Indeed some SCAR scientists, like John Behrendt, claimed that CRAMRA would have a positive effect both on environmental protection and on scientific research in general as any country wishing to proceed beyond prospecting would have to demonstrate a clear understanding of risks and mitigations. Politicians, such as Russell Marshall, New Zealand's Foreign Minister, praised CRAMRA for filling a dangerous legal vacuum without which there would be no control over exploitation or liability. Many conservation and environmental groups strongly disagreed with these views, since they felt that Antarctic mining should never be allowed under any circumstances.

Whilst the signatures in Wellington indicated agreement by the Parties ratification by all the claimant states was required to bring the Convention into force. The NGOs organized themselves to mobilize public opinion and lobby ministers in what were seen as the weakest countries.

Australia, the country with the largest claim to Antarctic territory, was the first to withdraw and refuse to ratify the Convention. Australian Prime Minister Bob Hawke explained his country's rejection of the treaty by saying

"First, the Antarctic environment is extremely fragile and critically important to the whole global ecosystem. Second, mining in Antarctica will always be dangerous, and could be catastrophically so ... we are convinced that the Minerals Convention is basically flawed. It is based on the clearly incorrect assumption that mining in the Antarctic could be consistent with the preservation of the continent's fragile environment. Any mining operation ... would have a lasting and major impact on the area in which it takes place."

This was not, of course, the real reason. The Australian Mining Industry Council was ambivalent over Antarctic mining but tended towards the position that signing CRAMRA would help protect the Australian national position. In this position it was supported by Australia's environment and foreign ministries who also thought that it would protect the Antarctic in general. Both the Australian Treasury and the Resources Ministry however had a different view, claiming that signing would undermine Australia's territorial claim, generate little revenue for Australia if others exploited the resources and that exploitation might, in itself, allow unprofitable mining that could undermine the Australian mining industry. Hawke also saw that he could mollify the Green Party in Tasmania, whose support he needed, by withdrawing Australia from CRAMRA. On 22 May 1989 the Australian Cabinet decided not to ratify CRAMRA.

Jacques Cousteau, French inventor of the aqualung and fervid environmental campaigner, had been active in France, claiming he achieved a million signatures on a public petition against CRAMRA. Visiting his friend President François Mitterand, Cousteau persuaded him that France would gain politically from being seen to be environmentally conscious, it would mitigate the public relations disaster of building the rock runway at Pointe Géologie near to Dumont d'Urville Station and the public would support non-ratification. Hawke capitalized on this during an overseas tour in June and the French government formally allied itself with Australia. This attempt to occupy the moral high ground was too much for some other countries. Belgium was the next to refuse to ratify, followed by India and Italy. New Zealand was in a difficult position as Chris Beeby, who had chaired the CRAMRA negotiations, was a New Zealander. Initially New Zealand criticized Australia for its position but soon public attitudes changed and the National Party, who had come out in favour of a World Park, won the next election and changed the country's position in Febru-

ary 1989. Meanwhile the USA, UK and Japan all denounced Australia and France for wrecking this important new initiative but they were soon facing a proposal, orchestrated by the Antarctic and Southern Ocean Coalition (ASOC) and others, to move instead to a more comprehensive form of environmental protection for the continent, underpinning its role as a place for peace and science.

Where did this new proposal come from? When Hawke was in Washington he gave a speech to the National Press Club in which he outlined an Antarctic Environment Protection Convention. During a visit from Prime Minister Michel Rocard of France to Australia in August 1989 it was announced that France and Australia would be promoting this joint initiative at the XV ATCM in Paris. Indeed, their joint working papers (XV ATCM WP2 & 3), supported by others from New Zealand, Chile, USA and Sweden pushed the Parties into organizing a Special Consultative Meeting immediately to agree on this new comprehensive regime for the protection of the Antarctic environment.

In November 1990 the Parties began the first session of XI ATSCM in Viña del Mar, Chile, to discuss comprehensive protection of the Antarctic environment. These Special Consultative Meetings are a device used to develop and negotiate particular arrangements outside the agenda and timing of the normal ATCMs but using the same rules of procedure. They have been used for agreeing CCAS, CCAMLR and CRAMRA as well as the Protocol and normally consist of a series of separate sessions at locations and times apart from the annual Consultative Meeting. R M Laws (President) and W N Bonner (Convenor of GOSEAC) represented SCAR and explained that excessive legislation could circumscribe scientific research, a point that was not universally understood or appreciated. A few days later The World Conservation Union (IUCN) held its triennial General Assembly in Perth, Australia. One of the workshops held during the Assembly was on mining in Antarctica and SCAR was invited to send a representa-

tive so the Executive Secretary attended. It was a frustrating two and a half days with Sir Martin Holdgate, Director-General of IUCN, trying to reconcile the extreme views of "green" participants, who would have been quite happy to have seen all human activity in Antarctica cease, and the pragmatic views of the majority, who recognized the value of scientific research in the region.

The final session of the series which comprised this ATSCM was held in Madrid, 3–4 October 1991 when the Protocol on Environmental Protection to the Antarctic Treaty, together with its first four Annexes, was adopted and signed on behalf of the Parties. Although much of the text of the Protocol could trace its origin to CRAMRA it was, nevertheless, a significant achievement on the part of the Parties to have completed the instrument in less than a year. It should be added that the "Greens" were largely satisfied by Article 7 that prohibited all mineral resource activities for 50 years. Despite the rapidity of drafting and adoption of the Protocol it would prove to be almost seven years before it entered into force upon ratification by all the Consultative Parties.

XVI ATCM in Bonn was a new experience for SCAR. This was the first ATCM at which SCAR had formal independent representation as an Observer and entitled to submit Working Papers and Information Papers direct to the meeting Secretariat. Working Papers are translated into the four official languages (English, French, Russian and Spanish) and must be tabled for discussion; Information Papers are translated only if requested and need not be discussed although, in practice, most are discussed. Nigel Bonner and Peter Clarkson represented SCAR speaking directly to the meeting rather than as previously when SCAR scientists included in national delegations could speak only through the heads of their delegations. It was an important meeting because the Protocol on Environmental Protection to the Antarctic Treaty, together with the first four Annexes, had been adopted at XI

At the close of XVII ATCM in Venice a “poem”, purportedly written by an Italian lady called Anne Engio, received a strictly limited circulation. Further “poems” followed at subsequent Treaty meetings where they were eagerly awaited by some Delegates. The last of these “poems” appeared at XXVIII ATCM in Stockholm in 2005 which, by a curious coincidence, was the last ATCM attended by the Executive Secretary of SCAR before his retirement.

XVII ATCM

The diplomats all have their say,
They work here in the strangest way,
Moving carefully around
Each other to secure their ground
On which to move a little nearer
To that point at which it's clearer
That the item of discussion,
By the Spaniard or the Russian,
Is one on which they all agree,
But each must feel completely free
To offer up his own suggestion,
Even though it makes congestion
For the progress of the meeting
So that chances of completing
A consensus on the item
That won't worry, scare or frighten
Politicians still at home
Who, because they could not come,
Wait anxiously by fax and 'phone
To hear what Delegates have done
And so what they will have to do
To get each measure safely through
Their parliaments to make it law

How to behave when once ashore
In that land of ice and snow,
Where diplomats so rarely go.
Then finally, when all seems lost
And Delegates reflect the cost
To stay in Venice for the meeting
To reach consensus all are seeking,
Suddenly, a word is changed,
A sentence here is re-arranged;
Delegates then all agree
That “This seems very good to me”.
And people ask “What was the trouble?
How did they get in such a muddle?”
The meeting's over, they did well;
Once back home they have to tell
Those politicians that, of course,
These recs must enter into force.
And so it all begins again,
The next agenda's set in train,
And they will meet again next year
To talk and talk ... Oh! Where's the beer?

Anne Engio

Venice, 1992

ATSCM in Madrid, and at this meeting the fifth annex on “Area Protection and Management” was adopted. The protected areas had always been a particular concern of SCAR and the new annex would mean revising all management plans for SPAs and SSSIs, a process that would provide a huge workload for GOSEAC in the coming years. Also present at the meeting as an Expert was a delegation from the Antarctic and Southern Ocean Coalition (ASOC), an environmental umbrella organization for about 200 “green” organizations as diverse as Greenpeace and the Worldwide Fund for Nature. The SCAR delegation held an informal meeting with the ASOC delegation that proved to be very confrontational. While both

sides had the same aim – to protect the Antarctic environment – their separate approaches, perhaps not surprisingly, were very different; SCAR's business was scientific research whereas ASOC's was environmental campaigning. These informal meetings however became a regular feature of succeeding Treaty meetings and, over time, they became less confrontational until, eventually, ASOC was quite supportive of SCAR on many environmental matters.

The recommendations from XIV ATCM and XV ATCM on environmental impact assessment had not gone unnoticed by the fledgling COMNAP who saw this as a major opportunity to provide direct input to the Treaty. Accordingly they organized



Carlos Rinaldi (Argentina) and David Walton (SCAR) on a white-water excursion, Japanese style, during XVIII ATCM, Kyoto, Japan, April 1994.

a three day Antarctic Environmental Impact Assessment Workshop in Bologna in June 1991 to develop the first practical guidelines. SCAR was invited to attend along with a wide range of technical and legal experts. The resulting publication on practical guidelines was an important development for the environmental officers in national operators who would be responsible for these assessments on all science programmes.

Quite separately there were several groups interested in what would happen to the Treaty as it approached the 30-year point in 1991, when any Party could ask for a review. One such group was the Ditchley Foundation. The Ditchley Foundations were established in the UK and the USA in 1958 to promote discus-

sion and better understanding of items of common interest between Britain and the US. Using a grand country house called Ditchley Park they have promoted around twelve conferences a year and the imminence of the 30th anniversary of the Treaty in 1991 persuaded them that one on Antarctica was merited in December 1988. Chaired by Dick Laws the attendees also included SCAR scientists Bob Rutherford and David Drewry as well as leaders of Treaty delegations like John Heap and Tucker Scully. The conclusions of the group were that a review of the Treaty in 1991 was unlikely; that a secretariat was needed both for co-ordination and information purposes; and that better co-ordination of science was a key objective. In this they recognized SCAR's role but noted that too often SCAR's reports and suggestions were ignored by national scientific research authorities.

XX SCAR, Hobart, 1988

September 1988 saw SCAR assemble in Hobart for XX SCAR. For many it was their first experience of Australia and proved quite different to the normal image of the continent – no deserts, no coral reefs, but sheep, apple orchards, convict settlements and a wonderfully temperate climate.

The welcome to Hobart for the Delegates was provided by a wine reception at Government House hosted by the Governor His Excellency General Sir Philip Bennett. The house was built in the mid-19th century in the style of a Victorian country house and retains most of its original features including beautifully panelled rooms, a huon pine ballroom floor and extensive ornate gardens. Such surroundings together with the chance to meet many people from the Tasmanian capital made this a most memorable evening. The SCAR banquet also proved a memorable evening not least because of the menu and the extremely drinkable Tasmanian wines. It was held in the Long Gallery at Salamanca Place, a set of converted old warehouses on the waterfront at Hobart, just a stones throw from where the Aus-

**Scientific
Committee on
Antarctic
Research**

**20
SCAR**

**International
Council of
Scientific
Unions**

Convener
Dr P. G. Quilty
Antarctic Division
Channel Highway
Kingston Tasmania
Australia 7050
Telephone 61-02-290 209
Facsimile 61-02-293 335

HOBART 1988

**THE XX SCAR BANQUET
The Australian
Gastronomic Tour**

**7.30 for 8.00 pm, Thursday 15 September 1988,
Long Gallery, Salamanca Place,
Hobart, Australia.**

Pie floater *Glenelg*

A highlight of any gourmet's visit to Adelaide, South Australia's capital. A hearty pea and ham soup ladled over a small prime beef meat pie. A tribute to the famous *Cafe d'Wheels*, a pie cart at the entrance of the Adelaide railway station.

Gumleaf-smoked squatter's jumbuck

Rural Australia's staple serving. A leg of prime lamb, hot smoked with gum leaves and glazed with herbs, black pepper and bush honey. Served with garden peas, new potatoes and carrots.

Peach melba

The classic Australian dessert. Served in operatic proportions with fresh King Island dairy cream.

**Billy Tea, lamingtons and gingernuts, plus a selection of
Tasmanian cheeses and fruit.**

Served with Australian sherries, ports and table wines

President
Dr C. Lorus
Laboratoire de Glaciologie et de
Géophysique de l'Environnement
Domaine Universitaire B.P. 96
38402 St-Martin-d'Hères Cedex
FRANCE

Past President
Dr J.H. Zumberge
University of
Southern California
University Park
Los Angeles
California 90089-0012
U.S.A.

Vice-President
Professor Dr G. Hempel
Alfred-Wegener-Institut für
Polar- und Meeresforschung
Columbusstrasse
D-2850 Bremerhaven
FEDERAL REPUBLIC OF
GERMANY

Vice-President
Professor E. S. Korotkevich
Arctic and Antarctic Research
Institute
Ul Beringa 38,
Leningrad 199226
U.S.S.R.

Secretary
Dr A. C. Rocha Campos
Universidade de São Paulo
Instituto de Geociências
Caixa Postal 20899
Cidade Universitária - Butantã
01498 São Paulo SP
BRAZIL

tralian Antarctic vessel *Aurora Australis* would be berthed in future years. A special version of the SCAR song book was produced to include both new Australian songs and ones from Japan, Germany and Russia. A good time was had by all!

The membership of SCAR continued to swell with Ecuador admitted to associate membership and Italy, Sweden and Uruguay upgraded to full members. The Executive changed the format of the Delegates meeting, inviting the Chief Officers

Science in the Snow

Some photographs from the XX SCAR Meeting in Hobart, Australia, September 1966.



Jim Zumberge (playing the accordion), Claude Lorius and Pat Quilty after the Banquet. This was Jim's last SCAR meeting and it was also the last rendering of the SCAR Marching Song.



Roland Schlich (France) and Carlos Rinaldi (Argentina) discussing a point in typically animated Latin style!

along for the first two days and devoting this time to discussing science, a welcome initiative for many and a direct result of the President's concerns that too much time was spent on bureaucracy.

Periodically the Executive had recognized that initiatives were needed to bring Antarctic science more clearly into the public consciousness. The growth of international interest in global problems, epitomized by IGBP initiatives, had also shown that SCAR was still very much organized along old fashioned disciplinary lines with little opportunity for fostering interdisciplinary discussions. In 1987 the idea of holding an Open Science conference to address both these problems was first raised in the SCAR Executive by Gotthilf Hempel. Much time was taken in Hobart discussing the content and structure of this proposed open science meeting and



Claude Lorius (France), Tak Hirasawa (Japan) and Sayed El-Sayed (USA) in conversation.



The SCAR cake, showing several penguin species undertaking various activities on the Antarctic continental cake!

a planning group was established under Hempel.

Allied to this a discussion of SCAR strategy, in the light of the Executive Committee concerns and a paper submitted by the UK, resulted in some clear decisions on two strategic goals and how to reach them. The Delegates agreed that "SCAR must play an active role in world science" and that it should continue to be "responsive to international events relevant to Antarctica where SCAR expertise in science and operations can be mutually beneficial". The first underlined the need for SCAR to become more involved in a variety of global programmes, whilst the latter vindicated those who maintained that the interaction with the ATS was a vital component of SCAR's role. The way forward apparently consisted of a series of motherhood statements, none

of which were new and all of which would put even greater workloads on the Chief Officers and the Secretariat.

As far as the future of the Logistics Working Group was concerned, at the behest of the Executive and in the light of the protracted discussions taking place in Hobart amongst the managers, the Delegates accepted the new terms of reference, agreed to the closure of the Logistics WG and accepted that a “new relationship with mutual respect of each other’s responsibilities, and the desire of both groups to forge a lasting and useful relationship will work to the benefit of the advancement of scientific research in Antarctica”. It certainly was not the outcome that SCAR had wanted but there was nothing else to be done other than move forward.

The new Executive Secretary

George Hemmen, who had served the Antarctic science community so well for so many years finally retired on 30 September 1989 handing-over to the new, full-time Executive Secretary, Peter Clarkson, who had taken up the post on 1 May 1989. George had been running SCAR, with due respect to the Executive Committee, for more than 27 years but the new incumbent was an unknown quantity. Clarkson, previously a geologist at BAS, now had to assume the mantle of “Mr SCAR”, a formidable challenge. Fortunately, SPRI continued to provide free accommodation for the SCAR Office so the management costs for the organization continued to remain remarkably low given the range of disciplines and programmes covered as well as the increasing number of SCAR countries.

Clarkson overlapped with Hemmen for a probationary period of 5 months to learn the job, although in reality it took him many years to learn the complexities of the system that George had managed with such apparent ease.

During this time he attended, with Hemmen, the meeting of the Executive Committee in Siena, Italy, 28–30 June 1989.

David Drewry also attended the meeting as the Chairman of COMNAP. The meeting was held in the peaceful ambience of the Certosa di Pontignano, a former Carthusian monastery now owned by the University of Siena and located a short distance outside the city. Topics discussed included SCAR’s participation in the International Geosphere–Biosphere Programme; planning the Antarctic Science Conference; and establishing an *ad hoc* group on Antarctic scientific data. A formal invitation from Argentina to host XXII SCAR in San Carlos de Bariloche was gratefully accepted and Professor Renato Funicello indicated Italy’s intention to host XXIII SCAR in Rome in 1994. For the Executive, the meeting was memorable for the opportunity to see Il Palio, the mad horse race around Il Piazza del Campo in Siena. This was followed by an invitation to join the open air banquet in one of the Contrade, the competing districts of Siena.

Meeting in Brazil in 1990 for XXI SCAR

XXI SCAR was held in São Paulo, Brazil, during September 1990. Professor Antonio Rocha-Campos, the Brazilian Delegate and elected Secretary of SCAR, had originally planned to host the meeting in Brasilia but the chosen conference centre was under construction and he was concerned that it might not be completed in time. He decided it would be safer to relocate the meeting to São Paulo, his home city, although the available venue would be less than ideal. His problems were compounded further when the reorganization of two government departments had resulted in the money allocated to the meeting disappearing from the relevant departmental budget. Eventually the funding was recovered and a successful meeting was held. This was an example of the problems that meeting organizers can face when relying on support over which they have no control.

This meeting was also marked by a change in SCAR. It was the first meeting since VI SCAR in 1962 where George Hemmen was not present from the SCAR Secre-



George Hemmen at home in April 2009, holding the clock presented to him by SCAR following his retirement in 1989.

tariat. Many Delegates spoke with deep respect for the work that George had undertaken during those years; he had forgotten more about SCAR than most Delegates ever knew but they were warmly welcoming to his successor. A collection was made for George that was used to



Sherburne Abbott (USA) followed by Carlos Rinaldi (Argentina), Dick Laws (UK), Sayed El-Sayed (USA) and José Valencia (Chile) dancing the conga after the Banquet at XXI SCAR.

purchase a retirement present; a mantle clock with its face bearing the inscription *Tempus fugit* and its case set with polished Brazilian semi-precious stones. This was presented to George later at the Scott Polar Research Institute, witnessed by his former colleagues there including Gordon Robin, an Honorary Member and former President of SCAR who, while he was the elected Secretary, had brought George into SCAR.

After the official opening of the meeting and following brief presentations, the Delegates agreed unanimously to admit



Kris Birkenmajer (Poland), Sherburne Abbott (USA), Gotthilf Hempel (Germany), Bill Budd (Australia), Gunter Weller (USA), Peter Clarkson (Executive Secretary) and Tak Hirasawa seated around the central table; Carlos Palomo, Josefina Castelví and Carlos Rinaldi (Argentina) are at the farther table during the Banquet at XXI SCAR in São Paulo.

Richard M Laws, President, 1990-94

Richard (Dick) Maitland Laws was born on 23 April 1926 and educated at Dame Allan's School in Newcastle on Tyne. He went to St Catherine's College, University of Cambridge for both his bachelor's degree (1947) and his doctorate (1953). In 1947 he joined the Falkland Islands Dependencies Survey and spent two years on Signy Island studying the life cycle of elephant seals. He was also Base Leader, magistrate and postmaster! His work later formed the basis for the management plan for sealing at South Georgia that he drew up in 1953. The 1953-54 season he spent as a whaling inspector aboard the *Balaena* returning to a research post in London at the National Institute of Oceanography. His work on marine mammals proved very important, allowing individuals to be aged for the first time leading to the development of species specific population models. Appointed Director of the Nuffield Unit of Tropical Animal Ecology in Uganda in 1961 he began work on elephants and other large African animals. In 1967 he moved to Director of the Tsavo Research Project in Kenya before returning the UK as a Leverhulme Research Fellow in 1969. At this point he decided to return to Antarctic work and joined BAS as Head of Life Sciences Division in 1969, becoming Director of BAS in 1973 on the retirement of Sir Vivian Fuchs. He remained Director until 1986 but also collected various other roles at the same time including Director of the Sea Mammal Research Unit (1977-87), Secretary of the Zoological Society of London (1984-88) and Chairman of the Cambridge University



Local Examination Syndicate. He began in SCAR in the Biology Working Group in 1972, becoming Chairman 1980-86. As UK Delegate to SCAR 1984-1993 he became President in 1990. After he retired from BAS he was Master of St Edmund's College, Cambridge for many years. For his many achievements Dick was awarded the Polar Medal and clasp, the Bruce Medal of the Royal Society of Edinburgh, an honorary doctorate from University of Bath (1991), made a Commander of the Order of the British Empire (CBE) in 1983 and elected a Fellow of the Royal Society in 1980. His name is also commemorated in Laws Glacier (60°38'S, 45°37'W) on Coronation Island in the South Orkney Islands.

Colombia to Associate Membership of SCAR and confirmed Finland, the Republic of Korea, The Netherlands and Spain as Full Members. This brought the membership to 24 Full Members and 4 Associate Members. Delegates also agreed to augment the Executive Committee with a third Vice-President to "spread the bur-

den being placed on members of the Executive to represent SCAR at an increasing number of meetings". In practice, the members of the Executive Committee all remained as busy as ever and, recognizing that they now had a full-time Executive Secretary, would frequently ask him to represent SCAR.

São Paulo was not at its best for the meeting. The pollution on some days was bad making it difficult for some Delegates to breathe and there were many days on which it rained and the plight of the homeless in the city were a salutary reminder of how difficult it can be in many SCAR countries to justify the resources for Antarctic research against pressing national social needs.

The facilities at the university however were excellent and the excursions included visits to the largest Japanese community outside Japan and to the coast at Santos.

The SCAR Antarctic Science Conference

Hempel's offer to host the open science meeting at the conference centre in Bremen, rather than a joint USA/NZ proposal for the meeting to be in Christchurch, had been accepted by the Executive Committee on the grounds that a European location would attract greater public and media interest. Entitled "Antarctic Science-Global Concerns" the four day meeting was intended to both raise the public profile of Antarctic science and foster better interactions between scientists from different disciplines. The Science Conference Planning Group met with the Executive Committee and all SCAR Chief Officers to finalize the structure for the Conference. Hempel, as Chairman of the



The introductory poster to the commissioned posters illustrating the science of the eight Permanent Working Groups of SCAR at the Antarctic Science Conference in Bremen, Germany, September 1991.

Planning group, made a presentation to the Delegates who approved the following programme:

- a. The Antarctic in the Global Scene
- b. Antarctic Research on Global Change
- c. Progress and Frontiers in Antarctic Science
- d. The Future of Antarctic Science
- e. The Framework for Research in the Antarctic
- f. Open Lectures
- g. Displays on National Operations
- h. Commissioned Posters
- i. Contributed Posters

The Conference was to be held in Bremen, Germany, 23–28 September 1991, and would be surrounded by other Antarctic meetings: SCAR BIOMASS Colloquium, Bremerhaven, 18–21 September 1991; SCAR IGBP Workshops, Bremerhaven, 18–21 September 1991; Antarctic Challenge IV, Bremen, 30 September – 2 October 1991; and XVI ATCM, Bonn, 7–18 October 1991. A small number of keynote addresses, a series of lectures on SCAR science and the importance of undertaking research in Antarctica and a major display of posters - 40 commissioned posters on SCAR science, 24 on national operations and nearly 200 submitted posters from individual scientists in the atrium of the Marriott Hotel – pro-



Logo of the Antarctic Science Conference.

Chapter 5. The Environmental Years (1988-97)

vided a formidable overview of Antarctic activities. As well as all this there were panel discussions and even an Antarctic art exhibition. About 500 people attended the meeting and Gotthilf Hempel made great efforts to interest the media but, outside of Germany, coverage was limited even in Europe and there was little interest shown from elsewhere. Equally unfortunate was the lack of representatives from the key target audience of Treaty Delegates; SCAR was preaching largely to the converted. In retrospect, the timing of the conference was less than ideal. Several Treaty Delegates later expressed their disappointment at being unable to come but explained that they could not afford the time or the travel costs. However, the mixing of different disciplines and the focus of the keynote talks on global problems and their solutions was more of a success and laid the foundations for the present biennial Open Science meetings which have steadily grown in popularity.

Gunter Weller, Chairman of the SCAR Steering Group for the IGBP, reported on the identification of six core programmes



At a reception during the SCAR Global Change Workshops in Bremerhaven, Claude Lorius (Past President of SCAR) was seen assessing the effects of global climate warming on the German grape harvest.

for an Antarctic Global Change Programme in the "White Book":

1. The Antarctic Sea-ice Zone
2. Palaeoenvironmental records from Antarctica
3. Mass balance of the Antarctic ice sheet and sea level
4. Stratospheric chemistry and biological effects
5. Biogeochemical cycles and exchanges in the atmosphere and ocean
6. Detection and prediction of change.

Each of the core programmes were to be developed by an international team of scientists at a planning workshop to be held in Bremerhaven, 18-21 September 1991. The workshops duly took place as planned and their reports provided the basis of a new publication *The Role of the Antarctic in Global Change: An International Plan for a Regional Research Programme* known as the "Black Book" and subsequently published by SCAR in 1992.

The request from the United Nations

The inter-sessional meeting of the SCAR Executive Committee was held in Zürich, Switzerland, 6-9 June 1991 at the invitation of the Swiss Commission for Polar Research and took place in the Institute of Geography. Among the topics discussed was a letter from the United Nations requesting SCAR to provide information on the Antarctic environment and advice on establishing an international Antarctic station. Dr S A Evteev, Assistant Secretary-General at the United Nations, was in Switzerland at the time and met with the Executive Committee and the Chairman of COMNAP. Prior to Dr Evteev's visit, the Executive had expressed very strong reservations about the wisdom and the practicalities of an international station and was very concerned about how to discourage the UN. Dr Evteev made a short presentation of the station proposal by the UN causing further gloom amongst those present. However, Dr Evteev went on to explain that he understood about

living and conducting scientific research in Antarctica because he had worked at Mirny and later spent a year at McMurdo Station as a Soviet Exchange Scientist in 1959–60. Therefore, he was well aware of all the difficulties that would be involved with an international station and so he, personally, thought it was a very silly idea but “I have to present the proposal”. The tension of the meeting rapidly evaporated and was followed by an extremely useful discussion that assisted greatly with the preparation of a response to the UN regarding the proposed station. SCAR would restrict its reply to scientific advice while COMNAP would advise on operational matters.

XXII SCAR, San Carlos de Bariloche, June 1992

The Antarctic Treaty Meeting of Experts in Buenos Aires was followed, after the weekend, by XXII SCAR held in San Carlos de Bariloche in the foothills of the Argentine Andes, 8–19 June 1992. The meeting had been timed to take place immediately prior to the start of the skiing season so that participants enjoyed a daily fall of wet snow and slushy streets. All the SCAR Working Groups met during the first week and a common theme in many of their recommendations concerned the implementation of the Madrid Protocol. The geologists also pronounced on rock group nomenclature and the protection of geological specimens, the latter being an issue for SCAR to raise at the next ATCM.

It was at this meeting in Bariloche that the dispute between the USA and New Zealand over the use of Arrival Heights came up for public discussion. The Arrival Heights protected area was one of the earliest designated (SSSI 2) in 1973 and unique in that its purpose was to protect an area of very low radio noise for scientists carrying out radio research on the Earth’s atmosphere and near space environment. As activities at McMurdo and Scott Base grew ever more complex and electromagnetically noisy the instruments installed at Arrival Heights were



The logo for the XXII SCAR Meeting in San Carlos de Bariloche, Argentina, June 1992.

increasingly impacted by unwanted radio noise. This was brought to a head by the installation by Telecom New Zealand of a satellite earth station at First Crater (which some alleged infringed the SSSI boundary) transmitting across the site at a low elevation. This was meant to be a major step in improving communications for both New Zealand and the USA but suddenly turned sour.

SCAR first became involved when the issue was raised at the Solar-Terrestrial Astrophysics Research (STAR) WG meeting at XXII SCAR by American scientists. Accusations that the earth station breached the boundary of the SSSI, that there had been no international consultation on its position and output, that the environmental impact of the station had not been properly assessed and so on, made it clear that this was an issue that could not be easily progressed in an open forum so a private meeting was convened, chaired by the President, and involving Ted Rosenberg, Charlie Bentley, and Bob Rutford from the USA and David Geddes, George Knox and Malcolm Macfarlane from New Zealand together with John Dudeney as Chairman of STAR. As a result of these discussions the SCAR Delegates were faced with two resolutions (one of which demanded the removal of

the earth station) but finally agreed on a composite one requesting that both sides confer under an independent chairman to see what could be done to solve the problem.

As Chairman of STAR John Dudeney was charged with organizing and chairing a resolution meeting in Cambridge after appropriate preparations. Considerable work proved necessary and since this included radio noise surveys and detailed examination of the radio interference on the experiments at Arrival Heights it took over 18 months before the meeting could be convened. It was clear that there were two issues to be resolved – one was an ATCM political issue about the management plan for the SSSI and the way New Zealand had approached the construction of the station. The second was a scientific issue of establishing if the earth station was actually damaging any of the existing experiments and if its bandwidth would preclude particular sorts of new experiments. This was an issue for SCAR.

By now the problem had risen up the political agenda with formal exchanges between the New Zealand and US governments as well as articles in popular science magazines like the *New Scientist*, which quoted Louis Lanzerotti as saying “I am amazed at their audacity. It’s like putting a nuclear power station in a penguin rookery” and letters to *Science* and *Eos*. The newspapers in New Zealand not surprisingly also took a predictably partisan view and there were wild accusations thrown around that this threatened the very basis of Antarctic science.

Attending the 2-day meeting at BAS in March 1994 were three New Zealanders (Fred Davey, Gordon Keys and Ian Axford) together with three Americans (Louis Lanzerotti, Ted Rosenburg and Anthony Fraser-Smith). A consensus report was achieved in which some of the original complaints were vindicated but others were shown to have little foundation. For instance, it was agreed that there was an increased noise level at Ar-

rival Heights but its origins appeared to lie with activities at McMurdo and Scott Base rather than with the earth station. It was not possible to say with any degree of certainty that the earth station had breached the boundaries of the site as they were so imprecisely described. There was no reliable evidence that the existing operation of the earth station had impacted the experiments then being conducted. The recommendations for the direct management of the protected area were simply a re-iteration of what had been previously intended. What was new was the proposal for an Antarctic Specially Managed Area (ASMA) centred on the site and with a radius of 100 km in which existing levels of electromagnetic radiation would be reduced, electromagnetic compatibility would be an essential part of planning for all new equipment in this area and periodic noise surveys would be conducted to determine how these objectives were being achieved. The ASMA was to be managed jointly by the two National Operators and its effectiveness reviewed annually by a panel of experts appointed by SCAR.

Various mitigation measures were taken by both national operators, the fuss died down and the science continued. SCAR submitted its recommendations to XIX ATCM as Information Paper 57 and the US and New Zealand also jointly submitted Information Paper 86 thanking SCAR for its efforts in resolving the matter although noting that the recommendation on the ASMA did not appear to be feasible. Indeed, the proposals for the ASMA were never actioned, possibly because of the need for a rotating “Manager” and the probable American objections to working under a New Zealand manager. Whilst there were some initial efforts on noise surveys in the area it is not clear that they have continued. What was clear from this incident was that the existing protected area legislation was never likely to be suitable for protecting scientific activities of this sort from interference. An altogether different approach was needed but there was no po-

litical appetite at the Treaty for finding a sensible solution and the protected area continues just as before.

During the second week, the Delegates welcomed Pakistan and Estonia to Associate Membership and approved the transfer of Ecuador to Full Membership. Following the global change workshops organized by Gunter Weller and the SCAR Steering Committee for the IGBP and the tabling of the draft report *The role of Antarctica in global change: an international plan for a regional research programme*, the Delegates agreed to establish a new Group of Specialists on Global Change and the Antarctic. The group would provide links between SCAR groups and act as an information clearing house on global change research; provide liaison between SCAR and other major international global change programmes; plan and implement a regional programme of global change research in the Antarctic; and recommend a structure to implement the programme including an interface with COMNAP. Professor Charlie Bentley would be the Convenor.

The Delegates also agreed to the proposal to establish a SCAR-COMNAP *ad hoc* planning group on Antarctic Data Management. Membership of the group would cover a number of nationalities and disciplines that would prepare a report on the current status of Antarctic data and plan activities to provide a comprehensive framework for the management of the data. The report should be completed in time for submission to XVII ATCM.

The *ad hoc* Planning Group on Antarctic Data Management reported to both the COMNAP and SCAR Executive Committees in 1992. The proposal identified the need for an integrated directory of all Antarctic data, agreed international standards for data and an international database system. The first element was to be met by building an Antarctic node as part of the Global Change Master Directory (GCMD) run by NASA and the estimated cost for this was US \$200,000 per year. The Executives decided to think about this a little further.

In 1988 the Working Group on Human Biology and Medicine had established an *ad hoc* Group on Antarctic Space-Related Human Factors Research. The purpose of the Group was to consider aspects of living and working in Antarctica could provide guidance on conditions that might be encountered during long manned missions into space. The analogue focused on the isolation of small human communities in the Antarctic for lengthy periods. One aspect concerned medical conditions, particularly in the field of microbiology, and another concerned the psychological effects. The timing of such studies was important because the accessibility of Antarctica, in terms of both communications and physical contact, was changing rapidly as transport to and from the continent improved, especially with increasing use of aircraft. The group held two meetings, chaired by Des Lugg and included representatives from the US National Aeronautical and Space Administration (NASA) and the European Space Agency (ESA). The group was closed at XXIII SCAR in 1994.

The SCAR Executive Committee met in Stockholm, Sweden, 13–16 April 1993. The ICSU review of SCAR had been received and it was critical of many aspects of SCAR. The Executive was unimpressed and regarded much of it as poorly informed and inadequately argued. A proposal that there should be a single committee for the polar regions was regarded as unnecessary as the contrasting situations of the Arctic and Antarctic would require two subcommittees that would simply imply an extra level of bureaucracy. Nevertheless, it was agreed that SCAR and IASC should maintain closer contact. The review also criticized SCAR for spending too much time attending to matters from the Antarctic Treaty, a criticism that the Executive Committee rejected outright on the grounds that it was important to protect scientific research. In a subsequent discussion with the Executive Director of ICSU, SCAR's position as an independent scientific adviser to the Treaty was formally accepted, much as ICSU itself acted as the independent

scientific adviser to the United Nations. At a joint meeting with the COMNAP Executive it was finally agreed that a new Antarctic Data Directory System should be established and the details were developed later that year at a meeting in Boulder in September.

XXIII SCAR, Rome, September 1994

XXIII SCAR was in Rome, 4–9 September 1994, characterized for many by hordes of gypsy children molesting Delegates as they walked from their hotels to the meeting. It was very hot and the lack of air conditioning in the meeting rooms left everyone sweltering and, if they had eaten a truly Italian lunch, quietly sleeping in the afternoon. Mario Zucchelli was the chairman of the local organizing committee and made the meeting memorable for many with the social arrangements, starting with a bus tour on the Sunday of Roman sites including the Colosseum. The welcome cocktail reception for the working group members was held at the Accademia dei Lincei, founded in 1603 and the oldest scientific academy in the world with Galileo Galilei as one of its first members. In the second week the Delegates had cocktails in the Botanic Gardens and finished with a truly splendid evening banquet up at Villa Miani, on one



The logo for the XXIII SCAR Meeting in Rome, Italy, August – September 1994.

of the hills overlooking Rome. The Villa is surrounded by its own park and the view from the terrace over Rome, sipping wine as the sun set, was an outstanding experience.

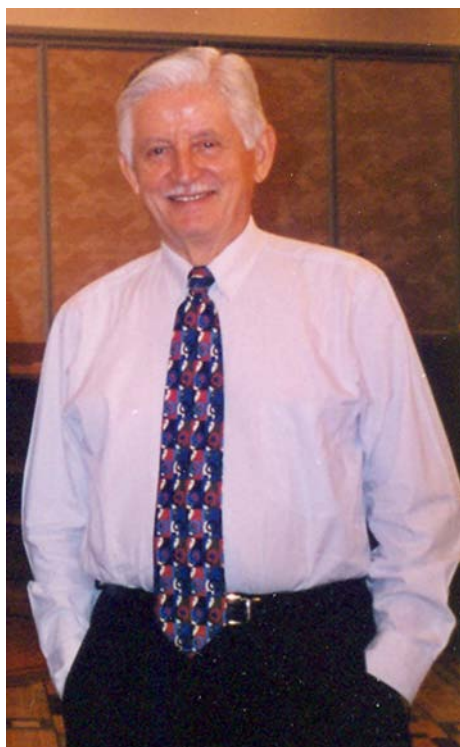
Delegates welcomed Canada and Ukraine as new Associate Members and agreed that Bulgaria should also become an Associate Member from 5 March 1995, after the expiry of a six-month period of formal notice. The SCAR Global Change Programme was discussed at length and there were widely differing views on



A plenary session at the XXIII SCAR Delegates' Meeting in Rome, Italy, September 1994.

Antonio C Rocha-Campos, President, 1994-98

Professor Antonio (Tony) Rocha-Campos graduated and got his PhD from the University of São Paulo, São Paulo, Brazil. His research refers mainly to the geological record of past ice ages in Gondwana. As a geologist, Tony is a veteran of eleven scientific expeditions to West Antarctica where he is studying Cenozoic glacial sedimentary rocks. He started his participation in SCAR activities in 1984, during the XVIII SCAR Meeting in Bremerhaven, Germany, as Delegate of the Brazilian National Antarctic Committee. In the meeting, he successfully presented Brazil's candidacy as a new full member of the Committee. Tony was a pioneer scientist in the Brazilian Antarctic Program (PROANTAR) in which he became involved from its inception in 1982. From 1984 to 2005 he was Scientific Coordinator of PROANTAR and member of all the other national Antarctic organizations. Tony has been a representative of the Brazilian Academy of Sciences at the National Council for Antarctic Affairs (Ministry of External Relations) and from 1984–2003 was an assessor of Brazilian delegations to Antarctic Treaty Consultative Meetings. At the XIX SCAR meeting (San Diego, 1986), he was elected to the Executive Committee as Secretary of SCAR (1984–90), and became President of SCAR for the term 1994–98 at the XXIII SCAR meeting in Rome. From 1998–2002 he still served SCAR as im-



mediate Past-President. At the XXVII SCAR meeting (Shanghai, 2002) he was elected Honorary Member of SCAR. Presently, he is Professor Emeritus of the Institute of Geosciences, University of São Paulo, São Paulo, Brazil, and continues his position as a member of the National Committee on Antarctic Research, as the Brazilian Delegate to SCAR and a member of the National Council for Antarctic Affairs.

where to go next. Some Delegates were concerned at the apparent proliferation of subgroups, others that the objectives were still too broad and in some cases undertaking work that was being done well elsewhere. Eventually an agreed restructuring of the programme was tabled reducing the groups and their potential cost, which in turn did away with the need to establish a special fund for GLOCHANT. The generous offer of Australia to host a SCAR Global Change Project Office in Hobart was welcomed. Strong

views were expressed over the ICSU Review of SCAR which was thought to show little understanding of both current operations and the relationship with the Treaty. Recommendations from the meeting included proposals for the operation and management of activities in relation to SSSI No 2 at Arrival Heights on Ross Island; for the management of Antarctic scientific data; for the protection of the newly discovered subglacial lake beneath the Russian Vostok Station; and on the use and archiving of multi-channel seis-



The SCAR Executive Committee during XXIII SCAR in Rome: Claude Lorius (Past President), Carlos Rinaldi (Vice President), Peter Clarkson (Executive Secretary), Dick Laws (President), Kris Birkenmajer (Secretary) and Zhaoqin Dong (Vice President).

mic data within the Seismic Data Library System (SDLS).

Before the end of the meeting, Dick Laws completed his term of office and Tony Rocha-Campos (Brazil) was elected President.

The Executive Committee was invited to hold its meeting in Siena, Italy, 16–20 September 1995. This was in the week following the 6th International Symposium on Antarctic Earth Sciences, a hectic time for the Italians. Professor Anders Karlqvist, Chairman of COMNAP, and Roland Schlich, Chairman of the SCAR Standing Finance Committee, also attended the meeting. Discussions focused on the Global Change and the Antarctic (GLOCHANT) programme where the Group of Specialists was encouraged to develop a science and implementation plan. The progress of the SCAR-COMNAP *ad hoc* Planning Group on Antarctic Data was noted and it was agreed that the offer from New Zealand to host the Antarctic Master Directory at the International Centre for Antarctic Information and Research (ICAIR) in Christchurch should be accepted. The Executive Secretary reported that half the SCAR National Committees had advised the Secretariat in which of the new contribution categories they had elected to contribute. Schlich also noted that expenditure on scientific activities had increased whereas administrative costs had decreased.

XXIV SCAR, Cambridge, August 1996

It was the turn of the UK to host XXIV SCAR in 1996. Cambridge was a difficult place to organize large meetings as it had no conference hotels so the only option was to use the university colleges out of term time. The meeting was set for August on the assumption that the weather would be good and it used the very modern facilities of Churchill College's Møller Centre towards the outskirts of the town and close to the British Antarctic Survey.

The British hosts had decided to try to make this a memorable meeting in a number of ways. Not content with a fly-past of the BAS aircraft and a British military band marching to and fro on the Churchill sports fields the British representatives on each working group also agreed to invite all their colleagues to an evening reception at their homes, a feature that proved to be a logistical nightmare but went off very well in the event. Delegates were also offered the chance to try the traditional Cambridge pastime of punting on the River Cam; a new experience for many!

This meeting focused on the SCAR global change programme, the relationship with the ATCM and changes to the constitution, the last the result of consultations and redrafting by Bob Rutford over several years. Charlie Bentley, in presenting progress on global change made it clear just how complex the field was becoming, how the new Programme Co-ordinator Ian Goodwin had built up connections with a wide range of other global change offices around the world and how the GLOCHANT group would serve as the START Regional Committee for the Antarctic. Delegates spent some time discussing the ATCM, voicing concerns about the way in which SCAR observers had provided immediate responses to questions raised at the Treaty meeting that had not been discussed with Delegates, chief officers and the Executive, and how the content of the science papers should be thoroughly reviewed before submission so that they were not open to question. Professor



SCAR Delegates and Chief Officers at XXIV SCAR Meeting in Cambridge, United Kingdom, August 1996.

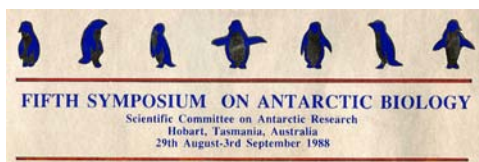
Rudiger Wulfrum attended the meeting to brief attendees on the progress with the Liability Annex to the Madrid Protocol. The Delegates finally approved a SCAR view on this as the basis for a paper to be presented to the Treaty Legal Expert Group in the autumn of 1996. Not everyone was happy about SCAR becoming involved in the legal discussions but it was clear that the lawyers needed some guidance with concepts such as impacts, repair, mitigation, damage and monitoring.

In the review of Groups of Specialists three groups (Structure & Evolution of the Antarctic Lithosphere, Cenozoic Palaeoenvironments of Southern High Latitudes and Southern Ocean Ecology) were all closed and the Delegates complained yet again about the short time scale given to them by GOSEAC to examine papers destined for the Treaty, especially new management plans. Professor M Magnusson, the President of IASC, attended the meeting to stimulate discussion of bi-polar interests and promote the joint IASC/SCAR Tromsø symposium on "Polar aspects of Global Change" in August 1998.

Biological Sciences

During this decade the biological work in the Antarctic became even more prevalent and wide ranging with most countries now significantly involved in either marine or terrestrial investigations. The BIOTAS programme aimed to implement an international terrestrial research programme across a disparate range of researchers. As in BIOMASS there was the question of standardized techniques, the establishment of a communications network through a newsletter and the selection of a number of key research sites in order to characterize habitat diversity and to study long-term change. Its outline programme was accepted by the Biology WG at XX SCAR in Hobart and the first of a series of BIOTAS workshops began with one on aerobiology and colonization at BAS in 1989.

Despite the considerable efforts of several people BIOTAS never worked as well as BIOMASS. There are many possible explanations but the lack of a clear political need of the sort that had driven BIOMASS, the limited or non-existent support for this type of science in many SCAR coun-



The logo for the Fifth Symposium on Antarctic Biology held in Hobart, Australia, August–September 1988.

tries, and the fragmented nature of the community were all contributing factors. The very general theme adopted at the start, chosen to allow the participation of as many researchers as possible, proved to be one of the principal weaknesses of this programme. The critical mass was always too small in each of the disparate areas to make the progress needed for the programme to become a convincing force. It formally ended in 1998 with many of its participants helping to formulate its replacement – Regional Sensitivity to Climate Change in Antarctic Terrestrial Ecosystems (RISCC). If BIOTAS was over ambitious in its original aims it did make some progress in establishing the extent of the community, organizing two international field seasons at Terra Nova Bay and Rothera, two very successful workshops and provided a major stimulus for the production of bryophyte and lichen floras for the continent. The BIOTAS bibliography of Antarctic terrestrial and limnological publications incorporated a great deal of material from outside the active groups in BIOTAS but gave a clear indication of the extent of the relevant research which proved to be much greater than expected.

The Fifth Symposium on Antarctic Biology was organized in Hobart, in the week preceding XX SCAR, by an International Steering Committee chaired by Gotthilf Hempel with José Valencia, Roy Siegfried, Nigel Bonner and Knowles Kerry and a local committee run by Knowles Kerry. Suggestions that Hobart was too far away to attract the community were quickly allayed when 212 scientists from 30 countries registered and presented 80 oral papers and 93 posters. Kerry was invited to work at AWI in Bremer-

haven to edit the volume with Hempel who had agreed a contract with Springer to publish the volume. There were too many papers for a single volume and it was therefore decided just to include those directly relevant to the theme of the meeting “Ecological change and the conservation of Antarctic ecosystems”. After much effort Kerry had collected all the papers together and was ready to leave for Germany. They were all in his car together with his computer when it was stolen. The thief was arrested an hour later when he attempted to run a road block set up to catch drunken drivers but neither the computer nor the manuscripts were in the car. Next morning Kerry wrote to every author explaining the problem and asking for copies to be sent to him at AWI, packed his bags and left for Germany. When Kerry finally returned from Germany he had a phone call from a bush walker reporting that the manuscripts had been found, dumped near a creek not far from where they were stolen, but the computer was never found. On the positive side the meeting was extremely stimulating for biologists, and the field excursions to the *Eucalyptus* forest and to the national park on Mount Field, with guided tours to the three vegetation zones, were very exciting for those who had not seen a platypus or an echidna before as well as showing the Gondwana linkages between Australian and South American vegetation.

The WG meeting in Hobart in 1988 was of considerable importance. Concerns about the introduction of non-indigenous biota into the Antarctic were raised and an *ad hoc* group was put together headed by David Walton to report on the extent of this and its implications. Earlier Knowles Kerry had realized in the 1980s that although several countries, including Australia, already had ethical codes covering animal experimentation, which they were applying to their activities in Antarctica, there was no generally agreed standard for all SCAR countries. Since animal experimentation is a highly contentious issue world wide any attempt to formulate

international standards was clearly going to be difficult but Kerry felt strongly that this was the sort of initiative that SCAR should undertake. The Biology WG established an *ad hoc* group of four people (Knowles Kerry, Roy Siegfried, John Croxall, with Arnoldus Blix as chairman) in 1988 to prepare a draft. The first draft immediately threw up problems as it included a section stipulating that undertaking a regulated procedure would require a licence and proposed that SCAR should issue licences, something far beyond the bounds of possibilities. It also recognized that some countries apparently had no legislation covering animal experimentation and might even be averse to adopting a non-legally binding code. After some difficulties an improved draft was adopted by SCAR in 1990 and this was also accepted by the ATCM as a Code of Conduct and later used in management plans for protected areas.

The need for a new type of Antarctic Protected Area was identified where multiple categories of use needed to be managed simultaneously. The WG identified several possible sites for its application – Arthur Harbour, Deception Island, Dry Valleys, Ross Island, Signy Island, Vestfold Hills – and a new statement of objectives for Antarctic conservation was agreed.

The BIOMASS Colloquium held at AWI in Bremerhaven in September 1991 was the culmination of one of SCAR's most important and far reaching programmes. It was the first time that the scientific community had attempted to provide information on multispecies management before a marine ecosystem had been seriously degraded by commercial exploitation, and it showed just how effective international collaboration could be in tackling these large scale questions. Without the efforts of BIOMASS it is not clear on what data the CCAMLR Scientific Committee would have based their early models or calculated the Total Allowable Catches.

Planning for the new programme on the Ecology of the Antarctic Sea Ice Zone

(EASIZ) began in Trondheim, Norway in 1990 and was further developed during a meeting in Bremerhaven, Germany in 1991. The aim was to understand the structure and dynamics of the Antarctic Coastal and Shelf Ecosystems (ACSE), the most productive areas of the Antarctic. The six key questions around which all the work was structured were:

- a. What is the role of ice in the Antarctic coastal marine ecosystem?
- b. How do communities of Antarctic marine organisms differ from those elsewhere?
- c. What physical, chemical, and biological factors determine patterns of production, sedimentation and recycling, and the major elemental budgets in ACSE?
- d. How are marine organisms adapted to low temperature and seasonal changes in the physico-chemical parameters characteristic of the ACSE?
- e. What is the nature and importance of the interaction between land (including shelf ice) and sea in the Antarctic coastal zone?
- f. How are the biological communities of the ACSE directly affected by human activities?

The programme proved to be very successful, running from 1994 to 2004 and involving more than 150 scientists and 17 countries. With a series of dedicated cruises beginning in 1996 on *Polarstern* and carefully planned workshops it was an exceptionally well prepared SCAR programme.

Group of Specialists on Seals

CCAS enshrined a special role for SCAR in advising Parties on how to manage seal stocks in the Antarctic. The first and only review meeting of this Convention was held in London in September 1988 and for that the Group provide a detailed report on permitting, sealing zones, exchange of information and a definition of commercial sealing. As it turned out the

CCAS review was a rather damp squib with little to decide since there were no indications that commercial sealing was about to start. There have been no further review meetings of CCAS.

At each of their meetings the Group continued to review the returns of Antarctic seal takes as required under CCAS but these were all at very low levels and necessitated no action.

Meeting in 1990 in São Paulo the Group of Specialists on Seals continued to be concerned about the data for pack ice seals which suggested wide scale declines in populations and they recognized a need for an internationally supported and co-ordinated census. They also concluded that some nations were not meeting their CCAS requirements in reporting on seals killed or captured and without accurate census data they felt they would be unable to discharge the SCAR requirements under CCAS.

The Group also noted that there was evidence of antibodies to canine and phocine distemper viruses in crabeater and leopard seals around the Antarctic Peninsula. Phocine distemper had become a major problem for seals in the North Atlantic in the late 1980s with many thousands of common and grey seals dying. The fact that antibodies had been found in Antarctic seals, together with the suggestion that canine distemper could jump the species barrier, meant that sledge dogs would be discussed as a potential threat to Antarctic seals in general when the Protocol was being negotiated.

Of more concern, following a review of all available data, was the unexplained declines in elephant seal populations at Kerguelen and Macquarie islands. This stimulated the Group to organize a meeting in May 1991 at the Monterey Bay Aquarium, Santa Cruz, California, USA, to review the situation and suggest key research requirements for the future.

When the Group met at Bariloche in 1992 a major new programme was devised. The Antarctic pack ice seals were

thought to comprise up to 80% of the global biomass of seals yet the population data were poor and for some species, like Ross Seal, there was still a great deal to learn about its basic biology and life cycle. The Antarctic Pack Ice Seals programme was outlined in Argentina and at a workshop in St Paul (Minneapolis, United States) in 1993 a prospectus was drawn up outlining the scientific objectives. In May 1994 at Padua, Italy, the next stage, an implementation plan, was developed describing the logistical requirements for survey work and locating the principal study areas for the proposed five year programme as well as appointing a Steering Committee of five chaired by John Bengtson. The programme was very ambitious and required considerable ship and air time so that implementation was going to be a problem. At last, in 1993, the handbook on research methods *Antarctic seals: research methods and techniques*, edited by Dick Laws, was finally published by Cambridge University Press after many years in gestation.

Human Biology and Medicine

After two years of discussion in 1989 in Aberdeen a new *ad hoc* Group on Space-related Human Factors Research had its first meeting. With representatives of both ESA and NASA present the emphasis was on looking for research on Antarctic analogues that would help inform the management of astronauts in the new space station. There were some very interesting ideas put forward – such as the proposal to build an Antarctic Planetary Test-bed – but in the end a much more modest pilot study on microbiology was agreed. Even this proved difficult to organize and in the end only France, Australia and the UK took part in a co-ordinated protocol. Claude Bachelard from France promoted a study on psychological assessment in which different countries would use standard psychological tests to determine the suitability of applicants for overwintering and their performance in Antarctica whilst Nelson Norman from the UK suggested telemedi-

cine developments to improve diagnosis. Whilst some of these were partially realized in other ways, as with most ideas put forward in this WG the impetus slowly died partly because most SCAR nations declined to appoint doctors to the Group but also because of the very few countries that were prepared to fund human biology research. Of all the WGs this was always the one with the fewest nations represented.

Geological Sciences

The geoscientists continued to feel that the periodic symposia on Antarctic Earth Sciences were a most valuable way of keeping the community informed of developments and they were always well attended. The 6th symposium was held in 1991 at the National Women's Education Centre in Ranzan, Saitama Prefecture, Japan, 9–13 September 1991. Despite clashing with the SCAR Open Science Conference in Bremen, 237 scientists from 20 countries participated in the symposium and presented 163 papers and 101 posters, making it the largest Antarctic Earth Science Symposium to date. Two 5-day pre-symposium field excursions were held viewing the metamorphic terrain of the Abukuma Plateau and the active crustal movements in the Izu Peninsula – Mount Fuji – Kofu Basin region. There was also a 7-day post-symposium excursion to the Hokkaido Hidaka-Kamui-kotan metamorphic belts. Papers were presented in three parallel sessions on the first two and a half days and in two

parallel sessions thereafter. It had been decided in the Working Groups that, in order to speed publication, a volume of extended abstracts, mostly about six pages long, would form the official symposium publication. This would allow authors to publish their contributions separately in international journals. Nevertheless, in addition the Japanese organizing committee selected 100 of the contributed papers and published these in a hard-bound volume the following year, a commendable effort.

The 7th Symposium on Antarctic Earth Sciences was hosted by the Italians at the Università di Siena, 10–15 September 1995. This was an even larger symposium than that in Japan with more than 400 participants from 26 countries. There were more than 400 paper and poster presentations and, of these, 162 were accepted, following peer-review, for publication in the symposium volume of 1200 pages. Many people thought that geological research in Antarctica would be in decline, following the adoption of the Protocol on Environmental Protection to the Antarctic Treaty because of Article 7 prohibiting mineral resource activities. However, Tony Rocha-Campos, President of SCAR and himself a geologist, when addressing the closing session took great pleasure in pointing out that the attendance and contributions to the symposium showed that earth science research in Antarctica, far from dying, was thriving as never before.



Participants at the VI International Symposium on Antarctic Earth Sciences at Ranzan, Japan, September 1991.

In 1992 Mike Thomson (UK) Chief Officer of the WG on Geology, floated the idea for the establishment of an informal group to co-ordinate geological research in the South Shetland Islands. There was a degree of enthusiasm for this and the project became known as “Collaborative Geoscience in the South Shetland Islands” with the acronym COGS. This seemed an appropriate acronym for a group that would mesh together the geological research interests of several countries. Several meetings of interested parties were held in the margins of SCAR geoscience symposia. Key problems were discussed with the aim of agreeing a preferred interpretation of the islands’ complex geology to gain a better understanding of their geological history. Plans were drafted for an international geological excursion to the islands to visit a number of key exposures where those geologists present could form an international consensus on the interpretation of the outcrop’s geology. Unfortunately, as sometimes happens in SCAR, the enthusiasm of the scientists at a meeting was not matched by those at home who hold the purse strings and the whole enterprise failed, largely for lack of logistic support. On the other hand, the initiative was not entirely lost and many years later SCAR formed the King George Island Science Co-ordination Group as a cross-SSG initiative to oversee co-ordination of all scientific activities in the South Shetland Islands where there is currently a plethora of summer and winter stations that is resulting in a great deal of duplication of effort.

Group of Specialists on the Structure and Evolution of the Antarctic Lithosphere

This Group had been established in 1986 and lasted for ten years. In 1989, with the support of NSF and co-sponsored by the Geology WG, they organized an international field trip to study the tectonics of the Scotia Arc led by their Convenor, Ian Dalziel. However, the major contribution of the Group proved to be organizing the Antarctic component of the Global

Geoscience Transects Project as part of the Inter-Union Commission on the Lithosphere. These transects were intended to provide data in a common format so that crustal details could be compared from anywhere in the world. In the end twenty transects were compiled and many were displayed as posters at AGU meetings. Out of this grew the realization that in explaining these data international efforts should be channelled through a new project – the Antarctic International Lithosphere Project (ANTALITH) – which would focus on five key areas: the Byrd Subglacial Basin, the Pensacola Mountains, the Gamburtsev Mountains, the Lambert-Amery Drift and the margin of the East Antarctic craton.

Group of Specialists on the Evolution of Cenozoic Palaeoenvironments of the Southern High Latitudes (GOSC)

Established in 1986 this Group was active over a ten-year period. Alan Cooper and Peter Webb, decided that a new initiative was necessary to provide for better international access to seismic data. Accordingly they organized a SCAR/NSF/USGS workshop in June 1990 in California to develop the idea of a new seismic library project called ANTOSTRAT (Antarctic Offshore Seismic Stratigraphy). This clearly struck a chord in the community as the project was agreed at XXI SCAR the following month and the following year two workshops were organized by the ANTOSTRAT Steering Committee in Oslo and Tokyo to assess the extent of the data available in twelve countries and design the library format. It was seen as an intermediate state between a national or institutional data collection and the existing World Data Centres. Despite some problems with initial funding the project gained momentum, thanks principally to the efforts of Cooper and Webb who also found time to establish *ANTOSTRAT News* as an information focus for the community. In response to the SCAR paper on the Seismic Data Library at XVII ATCM, Rec 12 put forward by the USA gave the Treaty’s seal of approval to this

new venture, publicly suggesting for the first time that data should be made generally available through the library only four years after collection. One of the funding problems was solved when USGS offered in 1993 to underwrite the costs of initial CD-ROM production for distribution to the eleven centres worldwide that agreed to host the library. Amazingly, this Recommendation is still not in force after almost twenty years as Ecuador, Japan and Korea have still to ratify it, but this has proved little disincentive to the other SCAR countries that have actively developed the library's facilities.

Physical Sciences

In 1987 the IAGA General Assembly decided to disband many of its Interdivisional Commissions and replace them with working groups. Thus the Interdivisional Working Group for Antarctic Research was formed with many elements of its remit rather close to those of the existing SCAR WG on Upper Atmosphere Physics. A proposal to merge the two was accepted by SCAR Executive in 1988.

At XX SCAR in Hobart the Group again spent most of their time on a symposium with 45 papers covering a very wide range of topics. The Delegates meeting agreed that the WG remit should be broadened to include all areas of atmospheric sciences and formally changed its name to WG on Atmospheric Sciences. A concomitant of this was a need to broaden the membership of the group to include specialists in the lower atmosphere.

Thus SCAR Executive agreed a new combined WG on Atmospheric Sciences, apparently at the behest of all national members. However in the USA the Terms of Reference and membership were disputed by the Polar Research Board at its meeting 1–3 April 1990. This position resulted directly from a memo and petition signed by 21 scientists at an earlier meeting in Palo Alto in March 1990. They considered the field to be covered was too extensive for a single WG and

would result in a lack of coherence in discussions and planning. This position was taken forward by the US Delegates to the next SCAR meeting in Brazil.

At XXI SCAR in São Paulo the Atmospheric Science WG held a symposium and three workshops as well as making a visit to the Brazilian Space Research Institute. It was at this meeting that John Lynch proposed a new international station on the plateau which would be ideal for a wave injection facility and for high latitude geomagnetic studies but despite forwarding a recommendation to the Delegates the idea failed to make progress. At the business meeting the members heard the arguments, agreed the remit for the group was too large and asked to be split up into two new working groups: Working Group on Physics and Chemistry of the Atmosphere (PACA) chaired by David Bromwich and Working Group on Solar-Terrestrial and Astrophysical research (STAR) chaired by Louis Lanzerotti.

In 1992 the International Astronomical Union established an Antarctic Astronomy Working Group and the STAR WG saw it as important that SCAR developed a complementary approach. By XXIII SCAR the STAR group, which had previously sponsored a symposium on Antarctic astronomy, drew attention to the interest developing in the USA, Australia and Italy by sending a recommendation forward to the Delegates.

Geodesy and Cartography

The 5th edition of "*Antarctica: a catalogue of maps and charts*" was published by SCAR in 1988 in a loose-leaf format. With 1400 entries from 17 countries it had grown considerably since the 4th edition in 1976. Sadly, despite the considerable efforts in compilation it was heavily criticized. The immediate response of the WG was to write to all the contributors requesting checks on what was included and updates on recent publications as well as identification of typographical errors.

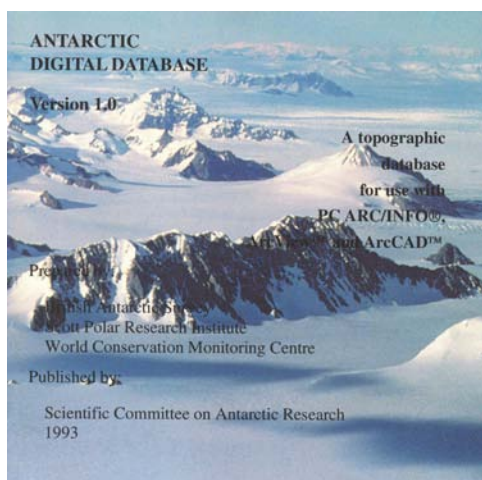
On 9 May 1991 the Antarctic Digital Database project (ADD) project was launched at the Royal Geographical Society in London. Its aim was to provide a single, comprehensive geographic framework for the continent and its surrounding islands all available on a CD-ROM. Getting to this point had been a lengthy activity with a need to bring together a range of organizations both to collect the necessary data as well as funding the production of the CD-ROM itself. The initiative for the project came from the WG on Geodesy and Cartographic Information and used material provided by eleven nations (Argentina, Australia, China, Germany, Japan, New Zealand, Norway, Poland, Russia, United Kingdom and USA). BAS, SPRI and World Conservation Monitoring Centre (WCMC) collaborated in its production with significant funding from a grant provided by British Petroleum. Actually collating the various data sets into a single framework proved complicated and time consuming, underlining the lack of consistency in Antarctic mapping that the WG had been trying to address for many years. After the publication of version 1 in 1993 BAS undertook to maintain the files and update them as new information became available, allowing new editions to be launched in later years. In 1999 version 2 became available on the

BAS server via the web-site. It proved an immediate success with the Antarctic community and soon other organizations were buying it for both academic and commercial use. The funds received from these sales were ploughed back into further work on the databases and the development of new products.

Group of Specialists on Global Change and the Antarctic (GLOCHANT)

The international science interest in global change was steadily growing in the 1980s as IGBP programmes rolled forward. SCAR needed to connect more directly with this and the Executive established a SCAR-IGBP Steering Committee to develop outline proposals for the next SCAR Meeting in 1988. A major achievement of this Steering Committee was the drafting of "*The Role of Antarctica in Global Change*", first submitted to the Scientific Advisory Committee of IGBP in October 1988 and then revised and published in October 1989. At the Bariloche meeting in 1990 the Steering Group established the six principal themes for global change.

In 1992 at XXII SCAR in Bariloche the Delegates, recognizing its importance for the Antarctic, agreed to establish a new group of specialists to replace the SCAR-IGBP group. Charlie Bentley was the first Convenor of the Group of Specialists on Global Change and the Antarctic (GLOCHANT). The original remit for this group was very wide requiring not only that they provide linkages and co-ordination between relevant national and international programmes but that they also plan and implement a regional programme of global change research. The disciplinary remit that they tried to cover was also very wide from the mass balance of ice sheets to oceanography and from numerical modelling to stratospheric chemistry. The original group consisted of Ian Allison, Gerd Hubold, Arne Foldvik, Dominique Raynaud, Paulo Artaxo, Paul Treguer, Fumihiko Nishio, Mark Thorley and Howard Cattle with Mario Zucchelli



The cover of the SCAR Antarctic Digital Database on CD-ROM.

as a link to COMNAP. The first meeting in February 1993 was held at BAS and made great efforts to encompass the rapidly changing and very diverse fields by allotting responsibilities to individuals for oversight and co-ordination and establishing seven subgroups on particular topics. They decided that a formal link should be developed to the System for Analysis Research and Training (START) which was sponsored by IGBP, WCRP and Human Dimensions of the Global Change Programme (HDGCP). It followed from that model that a SCAR START network would need to establish a Regional Research Centre for Global Change with a member of staff to co-ordinate national contributions and a Special Fund to meet the extra costs. A Call for Proposals to house this activity resulted in an offer from Australia to house it in Hobart. Advertising the job of Co-ordinator produced a gratifying response of 13 applications from around the world and Ian Goodwin was appointed. The proposal for the Special GLOCHANT Fund met with a positive response from SCAR and COMNAP but translating this into substantial cash flow proved to be more difficult.

The development of the GLOCHANT activities in the six themes gave rise to a host of different groups which can be linked under four broad headings:

Palaeoenvironmental change

ANTIME (SCAR GLOCHANT-PAGES) - history of the Antarctic continental margin

ITASE (SCAR GLOCHANT-PAGES) - recent history of climate change

PICE (SCAR GLOCHANT-PAGES) - long-term climate change records in ice cores

Mass-balance of the Antarctic ice-sheet, and its consequences for global sea-level change

ISMASS (SCAR WG-Glaciology - potential WCRP-CLIC) - ice-sheet mass-balance

Southern Ocean processes and climate

ASPeCt (SCAR GLOCHANT - potential WCRP-CLIC) - sea-ice physics and climate

SO-JGOFS (IGBP, SCOR) - ocean biogeochemistry

Ecosystem dynamics and response to climate change

RiSCC (SCAR WG-Biology - potential GCTE) - terrestrial and limnetic ecology

SO-GLOBEC (IGBP, SCOR, IOC) - marine plankton dynamics

This list does not represent the totality of global change science in Antarctica. Projects in some SCAR Working Groups (especially WG-PACA and WG-Glaciology) also contributed directly to an understanding of global climatic change, and there were also several large projects that sat completely outside SCAR but were of relevance to the Antarctic (for example two major developments in WCRP - CLIC and CLIVAR).

Chapter 5. The Environmental Years (1988-97)



Above: Deploying Current, Temperature and Depth (CTD) bottles during the *Oden* Southern Ocean Cruise in the 2008–09 southern summer season, part of a long-term research programme. Photograph: Swedish Polar Research Secretariat.

Below: Mayo Clinic graduate student Maile Ceridon, left, fitting Steven Slay with a LifeShirt that he will wear in bed at McMurdo and later at South Pole to compare various details of his sleep patterns at different altitudes. Photograph: Peter Rejcek / NSF.





Above: Rob VanTreese collecting water from Don Juan Pond, Wright Valley, in a study of the seasonal transition to test the hypothesis that the onset of darkness induces physiological changes in microplankton. Photograph: John Priscu / NSF.

Below: The recompression chamber at the Bonner Laboratory diving facility, Rothera Research Station. A chamber is a necessary precaution against incidence of decompression sickness (the bends) when diving. Photographer: Pete Bucktrout / BAS.



Chapter 5. The Environmental Years (1988-97)



Above: The 'birders' (from left Donna Patterson-Fraser, Rick Smaniotto, Kirstie Yeager, and Jen Blum) at Palmer Station analyzing giant petrel diet samples as a part of the Long Term Ecological Research (LTER) programme. Photograph: Peter Rejcek / NSF.

Below: The first Antarctic cruise of the Korean Icebreaker *Araon*. Photograph: Korean Oceanic and Polar Research Institute.

