

Chapter 4

The Expansion Years (1978-87)

New members join SCAR

For the first twenty years SCAR membership remained unchanged with the original twelve countries that established the original Special Committee in 1958. There seemed limited interest amongst other countries to commit to an expensive Antarctic research programme until, that is, the Treaty began to discuss mineral resources at a series of Special Treaty meetings. Suddenly countries wanted to be included in the decision-making. Joining SCAR was a way of establishing the scientific *bona fides* of the new countries and in 1978 first the Federal Republic of Germany and then Poland joined. Not to be outdone the German Democratic Republic joined in 1981, followed by India and Brazil in 1984 and China in 1986. The following year, 1987, showed a remarkable number of applicants for the new category of associate membership – Spain, Sweden, Peru, Italy, Netherlands, Switzerland and Uruguay. The major expansion of SCAR had begun and with it changes to the whole organization.

To codify its activities and provide a rule book for its committees SCAR had produced its first *SCAR Manual* in 1966. This early edition had clearly outlived its usefulness and by the end of this decade a new edition of the manual had been prepared by George Hemmen. This new edition omitted most of the historical background and the original lengthy section on the Antarctic Treaty, focusing much more on SCAR members and activities.

This was also the decade of sartorial elegance! The idea for a SCAR tie was precipitated by the enthusiasm shown for the BIOMASS ties. It was decided to have them designed and manufactured by the same company, Cravateur Tie Company in Cape Town. After initially sounding out opinion the Executive decided to go for the logo supported by a penguin on each side, and placed an order at the end of 1981 for an initial 250 made from polyester. However, before any were produced the sample designs were shown to other SCAR members and since the majority favoured the continent surrounded by a circle that was the design which was finally used. The order for 500 was completed late in 1982 but bulk shipment to the UK for distribution proved to be a problem. UK Customs wanted to levy such high import duty and VAT on the consignment that Hemmen simply refused to accept it, forcing its return to South Africa where Pat Condy kindly agreed to distribute the ties worldwide.



The SCAR tie.

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XV SCAR, Chamonix, 1978

With both Poland and Germany becoming the first new members of SCAR since its inauguration XV SCAR marked the start of the expansion of the membership. Poland had tried many years before to join but had been refused as it did not have an adequate scientific programme. By this time they had been working at their year-round station Arctowski on King George Island since 1977 and provided evidence of current and planned future activities. Whilst the Germans had not

yet established a station Gotthilf Hempel provided extensive evidence of recent German research in concert with other SCAR countries, as well as marine research on chartered research vessels, and provided details about the planned establishment of their new station Neumayer in the Weddell Sea. The acceptance of these two countries provided a format for all the following applicants in later years.

The Delegates discussed the progress with the report to the Treaty on the en-

George A Knox, President 1978–82

George Knox was born in Pleasant Point, New Zealand, in 1920 and educated at Timaru Boys High School. He received his initial degrees from the University of Canterbury. He joined the Zoology Department there in 1960 and directed a very successful marine biology team for 12 years. His academic career at Canterbury University spanned 35 years, twenty of which he spent as head of the Department of Zoology. He was involved in Antarctic conservation initiatives, BIOMASS and discussions on mineral exploitation. First appointed to the National Committee for Antarctic Research in 1959, he sat on the Ross Dependency Committee from 1965 to 1992. The NZ Delegate to SCAR from 1974 to 1986, he was also Secretary General and then President of INTECOL between 1978 and 1982. He remained the IUBS Delegate to SCAR until he could no longer attend its meetings.

He was elected a Fellow of the Royal Society of New Zealand in 1963 and received numerous awards including the Hutton Medal from the Royal Society of New Zealand (1978), Member of the Order of the British Empire (1985), and Companion of the New Zealand Order of Merit (2001). Most recently he was awarded the New Zealand Antarctic 50th Anniversary Award. He was made an Honorary Member of SCAR in 1982. He published over 100 scientific papers



and five books as well as numerous environmental reports. His last book on the biology of the Southern Ocean has been through two editions and remains the basic reference text. His field work took him to the Antarctic 13 times and he worked in the USA, Canada, Chile, Japan, Australia, China and Europe. The G A Knox Research laboratory at the Kaitiaki Research Station was named after him in 1986. He is commemorated in Mount Knox (77°32'S, 163°16'E). He died 4 August 2008.

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vironmental impact of mineral exploration and that, together with other requests from the Treaty, stimulated a discussion of the role and functions of SCAR *vis-à-vis* the Treaty. Whilst the importance of supplying independent scientific advice was agreed, the Delegates came down firmly against advising governments on resource management issues. To avoid this becoming a source of confusion it was agreed that a new statement on SCAR philosophy and objectives should be prepared. All the new activities proposed were clearly going to exceed the existing budget so subscriptions needed to increase. George Knox was elected the new President and as Tore Gjelsvik stood down he was elected an Honorary Member by acclamation.

XVI SCAR, Queenstown, 1980

At the Executive Meeting in 1980 there were discussions on how to change the role and functions of SCAR, based on a paper prepared by F J Hewitt (South Africa), as well as the need to expand the Executive and widen the pool of scientists eligible for election to office. Funding for BIOMASS continued to be inadequate and the activities only just managed to stagger along. An application for an ICSU grant for US \$25,000 to help with this was agreed. SCAR had begun limbering up to provide advice to the Treaty on minerals and, in the light of increasing tourism, the Biology WG Subcommittee on Conservation had produced "*A Visitor's Introduction to the Antarctic and its Environment*". On the advice of the WG Meteorology a Group of Specialists on Antarctic Climate Research was formed specifically to develop an Antarctic input into the World Climate Research Programme. Surprisingly, in the official record of SCAR, there is no mention of the air disaster on 28 November 1979 when an Air New Zealand DC10 crashed into Mount Erebus, killing all on board. Whilst this was a tourist flight and therefore nothing directly to do with SCAR the ensuing mayhem effectively cancelled most of the season's science at McMurdo

Station and Scott Base, which one might have expected to be cause for comment.

The following year the Executive had the first report from its Group of Specialists on Antarctic Environmental Implications of Possible Mineral Exploitation (AEIMEE), under the convenorship of Bob Rutford, which identified 15 areas in which they needed to gather data. As part of their thinking the Executive suggested to the Biology WG that they should elaborate proposals for new SPAs and SSSIs that would provide key protection against any future mineral exploitation. Some extra funding had come from four countries to support BIOMASS but the situation was still grave as extra travel funds were needed for the mineral exploitation group. The German Democratic Republic became the latest member of SCAR. It was at this meeting that SCAR realized that its responses to Treaty requests had not been discussed in Buenos Aires at XI ATCM as it appeared the Argentine Government had not asked for them. For the first time the unofficial pathway from SCAR through National Committees to government delegations had broken down. The latest revisions to the constitution and procedures, amending the 1972 changes, were finally published in 1981.

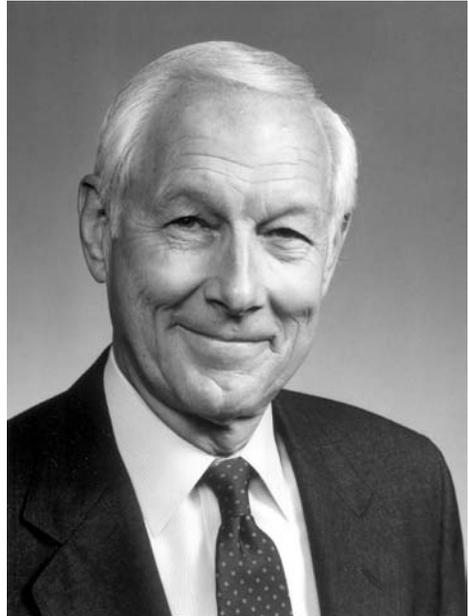
XVII SCAR, Leningrad, 1982

At the invitation of the Soviet Union the Third Logistics Symposium was held in Leningrad in 1982 as part of XVII SCAR, with 65 papers and 50 attendees. The Delegates' Meeting was held in the striking surroundings of the Palace of the Scientists (formerly the Palace of the Grand Duke Vladimir) on the banks of the Neva and only a short distance from the Winter Palace. With over 350 rooms there was more than enough space for the Antarctic meeting and there were some major topics to address.

There was much discussion of the BIOMASS programme and it was finally decided that the Group of Specialists on Southern Ocean Ecosystems and their Living

James H Zumberge, President, 1982-86

Born in Minneapolis James Herbert Zumberge received both his bachelor's degree and his doctorate in geology from the University of Minnesota. While teaching at the University of Michigan he led the US Ross Ice Shelf Project during IGY and this began for him a life long fascination with Antarctica. He continued summer field work in the Antarctic until 1962 when he was chosen as the first president of a new liberal arts college, Grand Valley State College in western Michigan. His success in both establishing the university, recruiting high quality staff and attracting millions of dollars in funding established a new career as a university administrator, rising through ever more prominent universities until his final appointment as president of the University of Southern California 1980-91. He was the US Delegate to SCAR 1972-86, advisor on Antarctic affairs to the State Department 1970-73 and chaired the US Antarctic Research Commission in 1984. An exceptional administrator, he joined the boards of a number of large corporations and was a keen skier and water polo player as well as a musician, playing the accordion and the piano. He died in Pasadena on 15 April 1992 at the age of 68. The



Zumberge Library and Zumberge Pond at Grand Valley State University's Allendale Campus are named for him, as well as Zumberge Hall of Sciences, one of the natural science buildings at USC. He received six honorary degrees and is commemorated in the Zumberge Coast (78°00'S, 74°00'W) and Cape Zumberge (76°14'S, 79°40'W).

Resources should be retained alongside BIOMASS, with a five man BIOMASS Executive to run the affairs of the programme as well as the BIOMASS Special Fund that had been established in 1980. A BIOMASS Data Centre was also needed, as was a much greater income to fund these activities. Having delivered a report to the Special Antarctic Treaty Consultative Meeting negotiating the minerals regime, the Delegates agreed that some more focused work on answering specific questions raised by the Treaty should be organized but that, if there was no formal response to the advice, SCAR should not take the work any further. A case was made for a new Group of Specialists on Sea Ice but this needed to be jointly de-

veloped with SCOR.

Observers from Brazil, China, India, Italy and the Netherlands attended the meeting, using the opportunity to collect advice on how to develop their cases for membership. The Finance Committee was clear that there were insufficient funds to address the many proposals and the Meeting accepted that, as well as a 12% increase in national contributions, applications needed to be made to ICSU for US \$14,000 to support the minerals and climate work whilst a further US \$25,000 was needed for the BIOMASS fund.

With the eighth ratification of CCAMLR the Convention came into force in 1982 but the invitation to SCAR to attend as

an Observer was not received before the meeting so SCAR was not represented – an inauspicious start to the relationship. However, Delegates decided that this should be rectified in future and SCAR should take an active part.

By 1983 AEIMEE had produced its final report which was rapidly approved by the Executive, without circulation to National Committees for comment, and sent on to the Special ATCM in Bonn discussing CRAMRA. SCOR had finally agreed to establish a joint Group of Specialists on Antarctic Sea Ice and the Executive agreed to co-sponsor with IUCN a symposium in 1985 on the scientific requirements for Antarctic conservation. This had not been straightforward as IUCN was regarded by many as simply a talking shop with little direct Antarctic experience. It was agreed that Nigel Bonner, Chairman of the SCAR WG on Biology's Subcommittee on Conservation, should be the SCAR representative to inject some rigour into the discussions and ensure that the outcomes were scientific rather than political.

SCAR rarely seemed to take time to consider its achievements. In 1983, at an international symposium in Kiel, Tore Gjelsvik, a previous President of SCAR, was asked to talk about scientific co-operation. In the course of describing SCAR's establishment and early development he took time to list eight major achievements from the meteorological station network and geophysical observatories to glaciological investigations and marine biology studies. Yet the way he described them begs the question of what SCAR had achieved and what was attributable directly to national programmes. As a facilitator and co-ordinator SCAR had often provided the forum for agreement and discussion, increasingly offered agreed international science objectives, and undertaken some important synthesis tasks, but it has never funded directly any Antarctic science. Yet everyone agreed that its influence was of great importance.

XVIII SCAR, Bremerhaven, 1984

The Federal Republic of Germany (BRD) was one of the newest members and was keen to show its support for SCAR so volunteered to host XVIII SCAR at the new Alfred Wegener Institute in Bremerhaven. There were now 17 members and observers from China, Uruguay, Netherlands and Sweden all indicated their enthusiasm to join in due course.

Political activities elsewhere were going to have an impact on SCAR. On 29 September 1982 Dr Mahathir Bin Mohamad, the Prime Minister of Malaysia, addressed the General Assembly of the United Nations on the subject of Antarctica. Contending that the area belonged to all and should rightfully be under UN oversight he requested that the UN seriously consider the future of the continent and its management. This political initiative gained further support from the Non-Aligned Group of countries and the UN First Committee was delegated to deal with it. At the United Nations in December 1983 Resolution 38/77 of the General Assembly stimulated the Secretary General to initiate a study on the "Question of Antarctica" and to prepare a "Comprehensive, factual, and objective study on all aspects of Antarctica, taking fully into account the Antarctic Treaty system and other relevant factors". SCAR received a formal request on 20 March 1984 from Viacheslav Ustinov, the Under Secretary General for Political and Security Council Affairs, asking for relevant information on scientific activities. SCAR provided ICSU with material for a preliminary response to the UN invitation for input to the review. To develop a more thorough response SCAR decided in 1984 to commission Richard Fifield, then Editor of the magazine *New Scientist*, to prepare a general account of all Antarctic science as co-ordinated through SCAR. The Chief Officers were asked to provide him with material and the first draft appeared for comment in 1985. Whilst the general approach and level of narrative was acceptable there were many detailed comments about the contents. Some groups

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felt that their material should have been included in its entirety, others felt that the balance between science areas was not appropriate, and many objected to the re-wording of their original submissions. There was duplication and erroneous information which all needed correcting. Fifield had an unenviable job trying to please this diverse group of scientific contributors as well as turning out a book that would appeal to the public and could be understood by the UN. He failed to acknowledge his debt to the Chief Officers for their contributions and the interactions throughout SCAR on this volume were less than satisfactory for all concerned. In the end the edited text was agreed by September 1986 but this continued interference from such a large informal committee did the book little good and its final format, when published in March 1988, lacked the immediate public appeal that a less supervised and more creative project might have produced. It did, however, answer the United Nations requirement with copies being sent to the UN for distribution to all permanent delegations.

At its 5th meeting in France the Group of Specialists on Southern Ocean Ecosystems and their Living Resources had realized that with the BIOMASS programme completed the group would be disbanded. They had other ideas and proposed instead that a new SCOR/SCAR group on Southern Ocean Ecosystem Studies be born out of the old with Sayed El-Sayed remaining as the convenor. Discussions at the Executive centred on this and the decision to disband the group and allow the BIOMASS Executive to oversee the remaining workshops and data analyses without any new initiative proved a difficult one. El-Sayed had not endeared himself to everyone during his convenorship and there were strong representations not to give him any further responsibilities, whilst others felt he had been unfairly treated. The Executive felt that the solution adopted met all these difficult points. There had been considerable discussion on the location of the BIOMASS

Data Centre with competing offers having been received from BAS and AWI. In the end BAS was chosen and a Data Centre Advisory Group constituted. The Executive also agreed to establish the *SCAR Report* series to carry reports of Working Groups and Groups of Specialists that were too long for the *SCAR Bulletin*.

XIX SCAR, San Diego, 1986

Meeting in June 1986 in the summer heat of San Diego there was a heavy agenda for the Delegates of XIX SCAR. The explosion of interest in the Antarctic engendered by the CRAMRA discussions had forced SCAR to consider how to deal with all the new countries. A proposal from Tore Gjelsvik to the Executive in 1985 suggested the establishment of a new category of membership "Associate Members" which would require changes in both the Constitution and Rules. These were agreed by the Delegates with an annual contribution set at US \$4000, a valuable new source of income for SCAR.

At the SCAR Executive meeting in Grenoble in 1987 the President, Claude Lorius, voiced some of his concerns about the problems facing SCAR. As well as a rising number of members SCAR was under increasing pressure from various organizations concerned with environmental problems as well as under political pressure from the Treaty. He noted that national operators wanted to create a new system that might conflict with SCAR and that the degree of SCAR involvement with big international programmes was causing concern. Observing that SCAR activities were not always appreciated he gave some interesting quotes:

"SCAR is so busy doing detailed business that there is no time for discussing visions, new ideas and opportunities"

"there are too many stations with useless duplication of programmes on King George Island"

"there were some questions about SCAR ability to manage large, interdisciplinary scientific programs"

Claude Lorius, President, 1986-90

Born February 25, 1932 in Besançon, Claude Lorius has a licence ès-sciences in physics (awarded in 1953), a diplôme d'études supérieures in physics (1954) and a doctorat ès-sciences in physics (1963). Responding to an advertisement on a bulletin board in 1955 on the walls of the University of Besançon: "Needed: young researchers to join scientific excursions organized in conjunction with the International Geophysical Year" he set off into the unknown polar regions beginning with an expedition to Greenland, and then wintering in Antarctica with two companions at Charcot Station, 2400 m up on the Polar Plateau. When Claude saw bubbles burst as ice cubes melted in a glass of whisky he realized they could hold vital information about composition of the historical air and thus was born a key new area of palaeoclimatic research. He established a team of glaciologists at the Laboratoire de Glaciologie et Géophysique de l'Environnement in Grenoble to develop ice-core drilling equipment and techniques for dating and interpreting the ice sheet archives. Drilling began at Dome Concordie on the high plateau in the mid-1970s. To everyone's surprise, they found much lower CO₂ and methane than today in glacial samples. By the 1980s they were continuing their work, again in collaboration with the Soviets, at Vostok. A series of major papers followed, establishing for the first time the way that temperature and CO₂ had followed one another through glacial and interglacials. Claude became Director of the laboratory in Grenoble, a position he held until 1988. He also held a number of roles at the national level: within the CNRS; at the Ministries of Research and the Environment; on the French National Committee on Antarctic Research, from 1987 to 1994; and the French Institute for Polar Research and Technology, which he founded in 1992. He also led a number of French Polar Expeditions, 1984-87. Internationally



he was a member of the World Climate Research Programme (WMO-ICSU) from 1980 to 1984, and the executive committee of Past Global Changes (IGBP) (1989-98). He was a member of the International Arctic Science Committee (1991-98). He was also a member of the executive committee of the Greenland Ice Core Project (1989-93), and he presided over the EPICA project (European Programme for Ice Coring in Antarctica) (1993-95).

He was awarded the Humboldt Prize (1989), Belgica Medal (1989), Italgas Prize (1994), Tyler Prize for Environmental Achievement (1996), Balzan Prize for climatology (2001), Médaille d'Or du CNRS (2002), Vernadsky Medal (2006), SCAR Medal for International Scientific Co-ordination (2008). He is in *Petit Larousse Illustré* next to Sophia Loren (2004)! He is an officer of the Légion d'honneur (1998), a member of the Académie des Sciences and Académie des Technologies. He is a foreign member of the Russian Academy of Science (1994), member of the Academia Europaea (1989), and European Geophysical Society Fellow (1999).

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He noted that Delegates' Meetings had become so intensive in terms of detailed business that there was not time for considering new opportunities in science. Although the Working Groups did some of this they had little visibility in the general science community and the overall profile of SCAR was low. It was time, he said, for SCAR to make a decision on its future – to continue to keep a low profile and devote itself to science or seek to play a significant role in Antarctic activities and world science. This latter idea led on to further discussions about developing a new science strategy and the Executive agreed to an extra meeting the following spring in Paris.

When the minutes of the meeting were circulated this last item struck a chord with several national committees. Gunter Weller, writing on behalf of the US Polar Research Board, urged that SCAR get closely linked to IGBP and use the XX SCAR meeting in Hobart to stimulate new thinking from the WGs. In his letter he also included criticism of how much time SCAR had been devoting to answering questions from Treaty Parties which had caused some to question the purpose of SCAR. This recurrent theme, questioning the resource costs of SCAR's interactions with the Treaty, would continue almost unabated for the next two decades. It seems surprising in retrospect that so many scientists simply failed to see that this science diplomacy had immense value for the scientific community in ensuring that an independent scientific voice was always injected into the legal developments, and that the legitimate interests of the scientists themselves were represented in this key international forum. There was apparently a feeling amongst many scientists that politics had nothing to do with their legitimate interests and SCAR should avoid getting involved. The reality, of course, is that politics is and always has been the underpinning for Antarctic science and we forget that at our peril.

The Executive agreed with a proposal from Chile that a new Group of Special-

ists on Antarctic Environmental Affairs and Conservation was needed to provide the cross disciplinary input to environmental questions at the Treaty. Hempel as Vice President was asked to draft terms of reference and a proposed list of members.

It was at this Executive meeting that Italy, Netherlands, Spain, Sweden, Switzerland, Peru and Uruguay were all accepted as Associate Members. The Executive was concerned that Korea had not yet applied but had apparently decided to go ahead with building a station on King George Island.

Despite Lorus's earlier suggestion that it would be simpler for SCAR to take a lower profile this did not seem the right course. It was decided instead that planning for a major Antarctic Science symposium in 1991 should go ahead, and that this should be used to raise the public profile of SCAR. The Executive also took the decision to advertise for a replacement Executive Secretary now that Hemmen had decided to retire. Finally, there was a meeting between the Executive and Chief Officers of the SCAR subsidiary groups (Working Groups and Groups of Specialists) to develop the first steps in a new SCAR science strategy.

Rumblings of discontent

The Logistics Working Group continued to be a problem for the Executive Committee. The idea of a new forum for managers began to take shape in 1985. Soon after Peter Wilkniss became Director of the Division of Polar Programs (DPP) at the National Science Foundation he met Jim Bleasel, then Director of the Australian Antarctic Division. Both men were new to their posts and unhappy with the way in which logistics was organized within SCAR, seeing logistics as far more important than it appeared to SCAR and believing that an NGO was an inappropriate body for organizing government funded activities. In this they were reflecting opinions expressed by Ed Todd, the previous Director of DPP, who wrote that:

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“...some SCAR participants forget that commitments to SCAR are not governmental commitments by most SCAR participants who have no such charter; this confusion has led SCAR to assume management direction of research activities to which governments are not committed, and to unwarranted criticism of governments that have declined the presumed commitment of resources necessary to implement them.”

Wilkniss believed that since managers were employed by governments they could not be a subservient part of an NGO, reporting to academics who might disagree with some of their decisions. Not surprisingly the SCAR Executive was alarmed by these developments, not least because of the aggressive way Wilkniss began to push them to the other operators and the damage many saw this would do to the way science and logistics had always been integrated.

At XIX SCAR in San Diego in 1986, discussions ensued in the WG on Logistics for a separate body. The informal discussions came up with the name National Antarctic Programme Directors (NAPDs). Wilkniss suggested that too many of the relevant ATCM topics in which the NAPDs had a major interest were being missed, delayed or lost in the existing SCAR system. Meetings of the NAPDs were needed to deal effectively with this and it would be better if the NAPDs were separate from the SCAR WG but that they met at the same time and in the same place. The overall response from the managers in these discussions was enthusiasm for change and the US, through Wilkniss, offered to host an extra meeting in Boulder in 1987 to establish the new NAPD forum and show how the agenda could be split with the WG. At San Diego, Bob Thomson from New Zealand was thanked for his ten years of efforts as secretary to the WG and was replaced by Jim Bleasel.

A two-part meeting was held in Colorado, 8–12 June 1987, hosted by DPP. First there was a Logistics WG meeting and

then one for the managers, which were mainly the same people with two hats. It was the latter which set the tone and pace, urged on by Wilkniss and Bleasel. There the logisticians defined the two new entities (Council of Managers of National Antarctic Programmes and Standing Committee of Antarctic Logistics and Operations), worked on terms of reference and listed the areas of immediate concern for their attention. Wilkniss had set the scene by circulating a definition of national programme director and reasons why some topics could only be seen as governmental, like air safety, rather than Working Group material, and the meeting soon accepted Terms of Reference for future MNAP meetings. Amongst these ToRs was the proposal that all meetings should be only in English, that meetings as far as possible would be held in government facilities and attendance would be strictly limited. It was at this meeting, during discussions on air operations, that an invited expert from the International Civil Aviation Organization produced a chart which showed extensions of existing Flight Information Regions down to the South Pole with their apparent allocation to Argentina, Chile, Australia and New Zealand, a situation that several members noted was both impractical and politically inappropriate. Some also thought that at least some of the topics under discussion - establishment of scientific priorities, co-operation in research, international scientific exchange - strayed too far into the territory of SCAR.

There was a further informal meeting, called by Lorius and Bleasel, in October 1987 during the ATCM in Rio de Janeiro between some MNAPs and members of the SCAR Executive. Lorius was initially very pessimistic about the future of SCAR if logistics broke away. At this point it appears Bleasel was still happy to talk about re-organization of the Logistics WG within SCAR, although managers from Argentina, Japan and China were reluctant. To try and resolve this the Executive decided to ask David Drewry and

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Jim Bleasel to the special SCAR Executive meeting in Paris in March 1988 to take part in the discussions. At the meeting in Rio de Janeiro Bleasel had made the case for the new group but suggested that both he and Wilkniss were now prepared for the group to be inside SCAR. Lorus agreed that if necessary SCAR could be restructured to accommodate the managers. After further discussions most managers opted for a group within SCAR although the possibility of independent decision-making without the SCAR Executive proved a potential stumbling block. It is clear that in Rio de Janeiro there appeared to be an agreed solution. Bleasel had even produced a series of possible decision diagrams suggesting how the different responsibilities would be put into practice. It seemed to many senior SCAR people that the loss of the managers to an outside body would render SCAR impotent and possibly politicized. Indeed, the concession of a place on the SCAR Executive for the managers suggested that power was shifting away from the scientists and over to the MNAPs, many of whom were political appointees often with minimal scientific background.

The Executive was working hard to keep the managers within SCAR and they thought they had agreed this with those present, although some apparently were reluctant. Later, on 5 November 1988, Jim Bleasel sent a telex to all the managers outlining the discussions and what had been agreed. Crucial to the managers acceptance of the SCAR framework was a set of five conditions

- a. Decisions by the managers on operational matters would be handled directly by the managers and would not be subject to alteration by other areas of SCAR; there would be a reasonable degree of independence for this group
- b. The general operation of SCAR would be made more efficient
- c. Matters which required joint operational and science inputs would be co-ordinated between the manag-

ers group and the relevant science working groups; the resulting joint SCAR decision would be promulgated through the SCAR Executive

- d. The inclusion of the managers group within SCAR would, in the short term, only be possible by creating such a group as a working group; this would be reasonable only as a short term measure and following a change to the SCAR Constitution, the group would be given higher status within SCAR and appropriate representation in the SCAR Executive
- e. The managers group could create whatever subgroups, responsible to it, which it felt were necessary. Subgroups would only be created where there was a need for relatively frequent meetings, such as for scientific working groups, and less frequent meetings would be catered for by symposia, workshops etc.

However, it turned out that this was not sufficient to keep the managers within the SCAR umbrella.

Bound up with this was what would happen to the SCAR Office with Hemmen retiring as it was clear that both Australia and Germany would be prepared to host the facility. The appointment of the new Executive Secretary was crucial as was an approach to SPRI on confirming they were willing to continue to provide accommodation.

Antarctic Treaty relations

At X ATCM in 1979 Recommendation X-3 had suggested that SCAR should prepare a telecommunications handbook, building on the previous symposium it had organized in 1972 in Oslo, Norway and the third Antarctic Treaty Meeting on Telecommunications held in Washington in September 1978. By 1980 the Working Group had a first draft ready for review and continued working on it, finally submitting what was now called SCARCOM to XII ATCM in 1983. It was welcomed by the Treaty Parties but they agreed that

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the task of keeping it updated should fall on a government organization and they accepted the offer from the Australian Antarctic Division.

The continuing requests from the Treaty for information and reports finally caused SCAR to ask Parties to consider the financial implications of this at XII ATCM. Surprisingly this appears to have had a positive reception resulting in Recommendation XII-8:

“Being aware also that the assistance requested of SCAR by the Consultative Parties imposes additional demands on scarce resources;

Recommend to their Governments:

That they consider in the light of its expertise and past assistance any requests that may be made by their national committees for additional funding to meet costs to SCAR of responding to requests for advice from Antarctic Treaty Consultative Parties”.

Predictably this was a toothless declaration and there is no evidence that any such extra funding was ever provided to support any SCAR activities. For many countries there is a disconnect between the funding for the science and logistics and the leadership of the ATCM delegation, which means that pious suggestions like this normally fall into a black hole after the meeting finishes.

It was also at this meeting that the Non-Consultative Parties attended for the first time, a feature which apparently precipitated a more wide ranging discussion on what expert agencies might also be asked to attend. XIII ATCM in Brussels in 1985 proved something of a milestone for SCAR's relations with the Treaty. Recommendation XIII-2 specifically invited SCAR and CCAMLR to become Observers at future ATCMs and to provide information and overviews as appropriate. This opportunity for SCAR to present both Information and Working Papers in its own right was to be fully utilized in later years.

At XVIII SCAR the Delegates had accepted a proposal that a further 13 new SSSIs should be designated to give better protection for on-going scientific research. The UK picked up this proposal and at XIII ATCM, on the basis of the UK submission, the Treaty accepted this major extension of protected areas. This more than doubled the designated protected areas and provided an important impetus for developing the system further.

As far back as 1960 SCAR had recognized that waste disposal rules were necessary for good environmental management and by 1975 the Treaty had accepted SCAR's advice and introduced the Code of Conduct for Antarctic Expeditions and Station Activities. This was certainly a step forward but with increasing numbers of countries active and the growing size and number of stations there was a remarkable lack of data on exactly how much waste was being generated and how it was being managed. In 1983 XII ATCM asked SCAR for advice on the extent of human impact on the Antarctic environment. The SCAR response came from the biologists, written by Bill Benninghoff and Nigel Bonner, and recognized that waste disposal was an essential part of normal activities but needed better guidelines as previous activities, including dumping waste on sea ice, were no longer seen as acceptable. At XVIII SCAR in 1984 new waste guidelines were discussed and at the following SCAR meeting it was agreed to form a Group of Experts on Waste Disposal chaired by Jim Bleasel from AAD with Nigel Bonner, George Knox and Bert Bolin. At XVIII SCAR the Sub-Committee on Conservation had formulated some further guidelines for waste management and it was from this basis that the panel attempted first of all to identify the range of wastes produced and their impacts. They attempted to gather information from national operators using a questionnaire and, as normal, this proved both slow and difficult with a considerable number of countries initially ignoring the request, although in the end all ex-

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cept one operator responded. The study continued for some years and it was only in 1989 that SCAR finally published its report and recommendations.

At the XIV ATCM in Rio de Janeiro, Brazil, in 1987, during the discussions on the depletion of the Antarctic ozone layer, the President of SCAR, Claude Lorius, made a presentation on the scientific activities of SCAR and its publications and this was included as an Information Paper in the documents for the meeting for the first time. SCAR had also been asked to assist the meeting in its discussion of Agenda Item 14: "Air Safety in Antarctica" and input here was provided by Jim Bleasel, Chair of the SCAR Working Group on Logistics, with both men attending the meeting both as members of their national delegations and in the formal listing as part of a formal SCAR delegation.

SCAR provided input to XIV ATCM on a number of other topics. On protected areas its proposals made some important recommendations: that Specially Protected Areas should have management plans, that a new category was needed which allowed for zoning of use (which would eventually become the Specially Managed Areas), that areas designated as SPAs needed to include adequate representation of all Antarctic ecosystems, and that areas and monuments should be visited periodically to assess their state and reports on these should be circulated to Parties. A previous request had asked for advice on how to improve accessibility for scientific data and SCAR's response was a paper from an *ad hoc* group established to review environmental data management. SCAR also registered its concerns about the siting of new stations and noted that their concentration in some areas (such as King George Island) could lead to unproductive duplication of science.

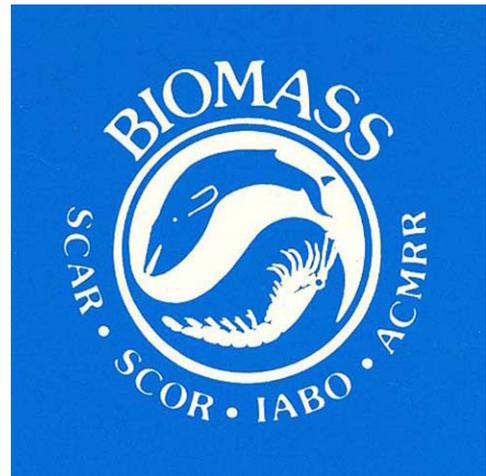
Biological Sciences

This was a period in which SCAR biologists began to acquire unstoppable momentum, helped by political initiatives

that were developing at the Antarctic Treaty. Concerns over fishing, and the possible harvesting of seals, stimulated the Antarctic Treaty Consultative Parties to begin developing management regimes to control exploitation. For these they needed scientific advice and SCAR was there to provide it.

It had become clear in the early 1970s that the expansion of fishing activities in the Southern Ocean, especially around South Georgia and Iles Kerguelen, by the Soviet Union and its allies within Eastern Europe (such as Poland), were untrammelled by any rules or regulations. The trawler fleets were on station year-round and, with periodic visits to factory ships to unload catch and refuel, were believed to be wreaking havoc in the poorly understood food chain. SCAR's response had been the establishment of the BIOMASS programme focused on krill.

Establishing the Group of Specialists for BIOMASS proved a trying business. For sensible political reasons SCAR decided that SCOR should be a co-sponsor but then the Advisory Committee on Marine Resources Research (ACMRR) from FAO became very interested and was also invited to help develop the initiative. John Gulland, at that time the head of the Marine Resources Service at FAO, played a



The logo of the Biological Investigations of the Marine Antarctic Systems and Stocks (BIOMASS) programme.

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major part (some said a dominant part) in the discussions. SCAR concern grew rapidly as increasing numbers of FAO scientists were suggested for a group originally limited to 12 people, already much larger than any other specialist group in SCAR. An increasingly complicated web of technical groups and working parties was proposed and SCAR became seriously alarmed not only at the possibility of a takeover of their initiative but also at the potential cost of supporting meetings. There were other issues over the possibility of rotating convenors, the loose wording over those who could claim observer status and the lack of representation from some countries like Norway. The files are replete with confidential letters directly and indirectly questioning the ability of individuals and the possible private agendas that were being developed. Despite all this a competent committee was finally agreed.

In 1980-81 the First International BIOMASS Experiment (FIBEX) took place with 13 ships from 11 countries, the largest oceanographic investigation ever organized to that date in the Southern Ocean. Despite this massive effort it was beyond their capabilities to survey the whole ocean so four key areas were targeted. The experience of this first attempt at survey provided many lessons for organizing the Second International BIOMASS Experiment (SIBEX) over the two seasons 1983-84 and 1984-85.

The Group of Specialists held its last meeting in June 1985 at Dammarie-les-Lys in France, full of enthusiasm from the completion of its last co-ordinated field season. However, the SCAR Executive decided that summer to disband the Group and all its subsidiary groups replacing them with a five-man BIOMASS Executive charged with organizing workshops, managing the BIOMASS Data Centre at BAS, and overseeing the holding of a final Colloquium.

With the ratification of CCAMLR in 1982 the Australians had offered to host the new secretariat in Hobart. The research

undertaken in FIBEX and SIBEX proved to be the crucial groundwork needed for CCAMLR to establish its Scientific Committee on a firm basis and develop its own programme of research and data collection for fisheries management purposes. Here again SCAR initiatives provided the science basis for policy making.

Concern about impacts on the Antarctic environment had surfaced early on with the Agreed Measures for the Conservation of the Antarctic Fauna and Flora passed in 1964 being the first tangible results. By VI ATCM in 1971 it had developed more energy and Recommendation VI-4 asked SCAR to tell the Parties not only what impacts were occurring but also how they could be measured and minimized. The Working Group on Biology was tasked to produce a response and this turned out to be a Code of Conduct for Antarctic Expeditions and Station Activities, which was tabled at VIII ATCM in 1977 and recommended to all Parties.

This SCAR did and even encouraged Parties to fund research into impacts, a proposal that certainly fell on deaf ears at all levels – Parties, National Committees and all the National Operators.

The following Treaty meetings generated a variety of motherhood recommendations with little or no direct effect but an increasing recognition that something more formal was needed. It was only in 1983, with Rec XII-3, directed again at SCAR, that anything substantive happened.

Bill Benninghoff was a botanist whose strong interest in polar biology developed from his early work with USGS in Alaska, Iceland and Greenland. He got involved with the US Antarctic programme after he moved to Michigan State University in 1957. He and Nigel Bonner saw this request as an important opportunity to get the process of environmental impact assessment incorporated into Treaty thinking and quickly set about drafting a text at the request of the Executive. Published as *Man's impact on the Antarctic environment: a procedure for evalu-*

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ating impacts from scientific and logistic activities in 1985 this had a major role in changing the then concept of stewardship to a more pro-active process, with environmental impact assessment progressively seen as a key tool in managing impacts. The document provided the basis for Annex I of the Protocol.

Despite the acceptance of the Code of Conduct by the Treaty the Conservation Sub-committee, chaired by Nigel Bonner, was convinced that something more publicly accessible was needed, a booklet that could be given to all visitors to the Antarctic, be they scientists, logisticians or tourists. With the assistance of a range of people including Bill Benninghoff, John Croxall, Victor Gallardo, Knowles Kerry, Jean Prévost and Sayed El-Sayed, Bonner produced "*A visitor's introduction to the Antarctic and its environment*" in 1980, a major step forward in summarizing conservation and environmental management aims in one document. Whilst still written in fairly dense scientific prose it was a real attempt to provide a more public summary of why and how everyone should behave when visiting this continent for science. The Sub-Committee was asked in 1982 to produce an annotated atlas of Specially Protected Areas and equivalents in the Antarctic and Sub-Antarctic which would provide an opportunity to fill gaps already identified in the ecosystem matrices. Bonner realized that there was not enough expertise amongst the existing membership and set about adding potential extra assistants including José Valencia, Yvon LeMaho, George Knox, Hugh Logan, Bruce Parker, Aldo Tomo and Stanislaw Rakusa-Suszczewski to his existing group of eight. The guide "*Conservation areas in the Antarctic*" was eventually published in 1985 by SCAR, co-authored by Nigel Bonner and Ron Lewis Smith.

As far back as 1960 IUCN, the World Conservation Union, had urged the Antarctic Treaty Parties to set aside inviolable areas of the continent for conservation. This exhortation was repeated in 1978 with additional attention being drawn

to the need to conserve krill and marine resources, a field in which SCAR was already very active. In 1980, along with UNEP and WWF, IUCN published the World Conservation Strategy to draw attention to the increasing pollution, habitat destruction and unsustainable harvesting that had proliferated across the planet. This global document was intended to enthruse others to produce regional strategies and in 1981 members adopted a resolution at the General Assembly to prepare a conservation strategy for the Antarctic. It was with this in mind that the SCAR Conservation Sub-Committee embarked on organizing a major meeting in Bonn in 1985, jointly sponsored by SCAR and IUCN, to develop the scientific requirements for Antarctic conservation. The meeting was well attended and the extensive discussions led to further meetings and workshops that delayed the publication of the final version until 1991. One of the outcomes was an agreement to form a joint IUCN/SCAR working group (SCAR Executive felt the terms "Task Force" sounded too militaristic) to formulate the detailed conservation strategy. Despite having an offer from IUCN to support all the costs of the group SCAR decided that this might allow IUCN too great an opportunity to set the agenda and agreed instead that each organization should fund its own participants. After some discussion these turned out to be: from IUCN John Beddington, Lee Kimball, and Paul Dingwall, and from SCAR Nigel Bonner, Pat Condy and Bill Benninghoff. Discussions at XXI SCAR pointed up some of the differences in philosophy between the two organizations and although the biologists were able to accept the joint document produced in 1986 the Logistics WG made what Bonner felt were uninformed and prejudicial criticisms, demanding significant changes to the document. This precipitated discussions of whether any future work should be done with IUCN if members of the SCAR community found their approach so difficult. In the end, since no written comments were received from the Logistics WG, it was agreed to continue the joint working

group. Despite the enormous input into the process by SCAR scientists the final Strategy was published as just an IUCN publication and in a format that was sufficiently forbidding to ensure that it would only be read by enthusiasts. This was an unfortunate and wasted opportunity.

At this same meeting the biologists also recognized that a more organized approach to data management was necessary to meet good stewardship requirements and proposed the establishment of an *ad hoc* group to review existing databases and make some proposals for future programmes. The rejection by the ATCM of SCAR advice on marine SS-SIs had been a blow but four further terrestrial ones were suggested. Dick Laws stood down as chairman of the Biology WG and was replaced by Gotthilf Hempel with José Valencia as secretary.

The success of BIOMASS had stimulated new thinking amongst the terrestrial and freshwater biologists in SCAR. At XVIII SCAR in Bremerhaven the Biology WG decided to establish a new group to promote and co-ordinate an international programme of terrestrial, limnological and littoral research. It had long been recognized that these research areas had been neglected, often because of the focus on marine research. Ron Lewis Smith was asked to convene an *ad hoc* group to develop a new programme named the

Biological Investigations of Terrestrial Antarctic Systems (BIOTAS). A progress report at San Diego suggested there was enthusiasm for this and SCAR formally established the initiative in 1986. A newsletter was initiated in 1987 as well as directory of existing and planned projects meeting the general theme "Biological processes in cold environments".

The expectation by the Biology WG had been that a symposium would be held every four years. But this all went wrong after the 3rd Symposium in Washington DC in 1974. There were no offers from countries to host the next meeting and so progress languished until Roy Siegfried and Pat Condy from South Africa came up with a proposal. This was still the apartheid era and South Africa valued the Antarctic greatly as one of the few international arenas from which it could not be expelled. So government funding appeared to support a memorable meeting in September 1983 in the small seaside town of Wilderness in one of the most beautiful areas of South Africa.

Yet again a different approach was used. The theme this time was "Antarctic nutrient cycles and food webs" and in a change to the format both oral papers and posters were allowed. In the end around 110 papers and posters were presented by the 170 participants from 13 countries. No Russian scientists were able to attend

Science thaws apartheid

★ SUNDAY TIMES, September 18 1983 5

By BRENDA HARTDEGEN

INTERNATIONAL Antarctic scientists have changed the face of apartheid on the Garden Route — temporarily at least.

All apartheid signs were removed at the beaches at the Wilderness and a tourist camp in George shortly before the 180 delegates from 12 countries arrived this week for the fourth international symposium on Antarctic biology.

And signs at the Wilderness Hotel were removed at the request of the organisers

Discriminatory signs felled on Garden Route

of the conference, the Scientific Committee on Antarctic Research (Scar). This is said to have been done to prevent the delegates from being "hurt or offended".

The signs at the tourist camp on the outskirts of George were removed by the local municipality, and the town clerk, Carel du Plessis, said that they would not be replaced once the scientists have gone. The "whites only" signs at the beach at

the mouth of the Wilderness Lagoon and at the other Wilderness beach, Leemans Klip, were removed by the Outeniqua Divisional Council, but the council's secretary, Dawie de Vries, said that he did not know if the signs would be put up again. He said the council was usually guided in these matters by the policy of higher authority — the provincial administration or the central government.

The signs were erected a few years ago after a large number of black soccer players converged on the Wilderness to play informal matches on the piece of land.

The land was set aside for soccer fields for staff of the Wilderness Hotel, but there were complaints of unruly behaviour and of the beaches being used as toilets because of the lack of proper facilities — so up went the signs.

"Apart from that one incident there has never been any trouble on the Wilderness beaches," said Mrs Beatrix Bosch, a leath-

Action taken to avoid 'hurting' 180 visitors

er artist who has lived at the Wilderness for 14 years.

"The signs were unnecessary, and it will be extremely hypocritical if they are replaced after the conference."

Professor Roy Siegfried, chairman of the local organising committee of the conference, refused to comment.

The only countries not represented at the conference are Belgium, Russia and East Germany. The first of the Scar conferences was

held in Paris in 1962, the second in Cambridge, England, in 1966, and the third in Washington DC in 1974.

The theme of this year's conference is "Nutrient Cycles and Food Chains". A banquet for the delegates was hosted at the hotel on Thursday night by Mr A B Eksteen, director general of the Department of Transport, and was attended by the Minister of Transport, Mr Hendrik Schoeman.

An urgent investigation into the demarcation of beaches along the Garden Route has been requested by the provincial administration.

Some months ago all the municipalities and the divisional councils were asked to send in their recommendations about which stretches of beach should be set aside for which racial groups.

Mr de Vries said these recommendations could not be made public as the matter was still under discussion.

An article in the South African *Sunday Times* describing measures taken by the local authorities to downplay apartheid during the SCAR Biology Symposium.

Chapter 4. The Expansion Years (1978-87)



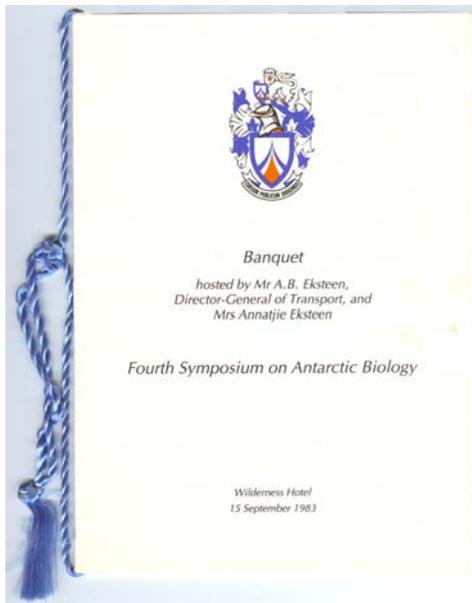
Participants at the SCAR Antarctic Biology Symposium at Wilderness, South Africa, September 1983.

because of the Soviet Union's political opposition to the South African Government, a situation which also apparently stopped participation from the GDR, and there were no papers published from Belgium or New Zealand. As expected there were many papers from the South African hosts as well as a surprising number from Germany which had only recently joined SCAR in 1978. Poland also contributed for the first time. This time five keynote

papers were invited on marine nutrient cycles, terrestrial and freshwater nutrient cycles, marine food webs, terrestrial food webs and the interactions between marine, freshwater and terrestrial systems.

Publication of the proceedings used a commercial publisher – Springer Verlag – and the three editors adopted the style of the journal *Polar Biology*. It was accepted that all papers had to pass peer review and they had to be submitted before the meeting. In the end the volume contained papers based on 46 oral presentations and 41 posters grouped in five parts. In his final overview of the meeting Dick Laws noted the move from survey work to process-orientated research driven by hypotheses, the need for more comparisons with elsewhere in the world, and the importance of winter observations. He concluded that future research should focus on repairing some of the holes in our knowledge – nano-plankton, winter in the pack ice, historical data on krill stocks, trace elements and their role, foraging by sea birds and accurate estimates of predation pressure at various levels in the food web.

An analysis of first author affiliations could be taken as indicative of the importance of biology in national programmes at that time. On this basis South Africa and the UK showed the greatest commitment to biology closely followed by the



Cover of the Biology Symposium banquet menu.

Science in the Snow

USA. Next was Germany, then France with the remaining countries only just present. Interestingly the keynotes were solicited from France, Germany, South Africa, UK, and USA, closely reflecting the final paper count.

Throughout much of this period the members of the Group of Specialists on Seals were primarily concerned with completing the handbook on research methods. The increasing numbers of fur seals at South Georgia had stimulated wider interest in fur seals in general and the Group co-hosted a meeting at BAS in 1984, together with BAS, US National Marine Fisheries Service and the US Marine Mammal Commission, on the Biology of Fur Seals. Attended by 35 scientists from 13 countries this was later published as a Technical Report by NOAA.

SCAR was awarded a contract from UNEP to investigate satellite-compatible telemetric data collection on Antarctic seals as a contribution to the FAO/UNEP Global Plan of Action for Marine Mammals.

Human Biology and Medicine

The International Biomedical Expedition to the Antarctic (IBEA) was the brainchild principally of Jean Rivoilier and Des Lugg and took four years to come to fruition. The scientific proposal was completed in June 1978 and was based on 12 people in the field for two months. The intention was for them to do normal work but for their responses to be measured. The programme was aimed at assessing if pre-acclimatization gives any advantages for working and if normal work in a natural cold environment allows similar changes to occur. The project was split into three phases – laboratory studies, field work and then laboratory studies again. The French agreed to support the traverse party, which left from near Dumont D'Urville on 31 December 1981, with a convoy of vehicles maintained by 11 men from Expedition Polaires Françaises to support the twelve strong medical team from Argentina, New Zealand, Australia, France and the UK. The field work oc-

cupied 10 weeks on the plateau and the team returned to Sydney to complete their tests and analyse the data.

It was an ambitious programme with projects in physiology, biochemistry, microbiology, immunology, psychology and epidemiology and it was not altogether surprising that all did not go to plan. One of the initial problems was that the WG appeared to assume that SCAR support and logistic backing would materialize as soon as it was asked for, forgetting the need for national committees and SCAR Delegates to consider such a major activity. It says a lot for the standing of Rivoilier that he was able to persuade the French to bear most of the costs. In addition to several scientific papers, a book "*Man in the Antarctic*" was published in 1988.

Des Lugg took over from Jean Rivoilier in 1984 as Secretary of the Working Group. The doctors requested permanent representation on the Logistics WG to deal with questions of healthcare but this was repeatedly denied them as setting a precedent in cross-representation. The WG also became increasingly interested in medical problems linked to the increasing proportion of women being recruited for Antarctic service. At this time most national operators were unwilling to share medical details with the Group so discussion of the extent of the problems – from pregnancy to behavioural changes – was largely anecdotal. One solution proposed was to split the WG into two with part being responsible for healthcare but operating within the Logistics WG and the remaining rump left with medical research as the existing WG. This did not find favour with the WG members and was a ridiculous solution driven by some very strange ideas on medical ethics from some national operators. Even today the situation remains unresolved.

Geological Sciences

SCAR had now become firmly involved in the discussions of mineral exploration/exploitation which was certainly likely to

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have significant repercussions on earth sciences if an agreement was reached and ratified. Negotiations were undertaken by the Treaty in a series of special meetings behind closed doors and SCAR was not invited to be represented, although SCAR scientists were included as advisors in many of the national delegations. However, SCAR decided that some more independent input would be helpful anyway and Martin Holdgate organized a workshop, this time at the Rockefeller Foundation Conference Centre in Bellagio, Italy, 5–8 March 1978, producing a report *Oil and Other Minerals in the Antarctic: the environmental implications of possible mineral exploration or exploitation in Antarctica* the following year. The original EAMREA group had been strong in environmental sciences but lacking in specialists in mining and oil technology. The Antarctic Treaty working group had included many technologists and geologists but few environmental scientists. In Bellagio all the groups were represented and there was a greater emphasis on oil as the key resource for exploitation.

The second SCAR report, published in 1979, was derived from work undertaken by a Group of Specialists on the Environmental Impact Assessment of Mineral Resource Exploration and Exploitation in Antarctica established by SCAR in 1977 with Jim Zumberge as the chair. The third report *Antarctic Environmental Implications of Possible Mineral Exploration and Exploitation*, edited by Bob Rutford and published in 1986, contained revised and updated versions of the first two reports as well as various relevant ATCM recommendations and papers. Having completed its work the Group was disbanded.

X ATCM had discussed the possibility of extending the designation of Sites of Special Scientific Interest to those of geological importance. In Adelaide in 1982 this prompted spirited discussion in the WG with final agreement that the key types of sites meriting protection were those with extensive fossil resources and that such designation would almost certainly



Participants at the Fifth Symposium on Antarctic Earth Sciences held at Robinson College, University of Cambridge, UK, August 1987.

Science in the Snow

“render the sites vulnerable to collection by non-scientists”. The geologists decided they wanted no part of such designations.

The Australians hosted the 4th SCAR/IUGS Symposium on Antarctic Earth Sciences, in Adelaide over 16–20 August 1982. The timing coincided with the centenary of the birth of Sir Douglas Mawson, Australia’s pre-eminent geologist who went south with Shackleton on the *Nimrod* expedition, 1907–09, and then led the Australian Antarctic Expedition, 1911–14, and the British, Australian and New Zealand Antarctic Research Expedition, 1929–30. More than 200 persons from 16 countries participated. 183 papers were grouped into 15 topics and were read in four concurrent sessions over the five days and, of these, 174 were published in the symposium volume, largely as complete papers but some as abstracts only. A 5-day pre-symposium excursion to the Eyre Peninsula and the Flinders Ranges proved popular with 40 participants and a similar number enjoyed the four 1-day excursions to see the geology local to Adelaide. All in all, Robin Oliver, Jim Jago and Pat James had organized a most successful symposium.

Five years on the geologists met again for the 5th SCAR/IUGS Symposium in Cambridge in 1987. This time it was the turn of BAS, in the form of Mike and Janet Thomson, along with Alistair Crame, to organize and host the meeting. These three also undertook the mammoth task of editing the proceedings volume that was published by Cambridge University Press. Nearly 200 participants from 19 countries made 138 oral and 34 poster presentations. The latter were well-attended and allowed more time for detailed discussions than was possible with the traditional oral lectures. Parallel sessions had become inevitable but were not popular with participants of wide-ranging interests. Pre-symposium field excursions to the north-west highlands of Scotland and the Wessex Basin in southern England demonstrated two classic areas of British geology and the extremes of the

British weather. The northern party endured torrential rain while the southerners enjoyed cream teas in the sunshine. Finally, no visit to Cambridge would have been complete without a punting party that proved a great success.

For many years there had been growing confusion over the names used in Antarctic stratigraphy. Bob Tingey had spent years collecting the diverse usage from his colleagues around the world and in 1983 the *International Lexicon of Antarctic stratigraphic nomenclature*, edited by him was finally published by the Bureau of Mineral Resources in Canberra for SCAR.

Oceanography

At XVII SCAR in 1982 the report from the WG sealed its fate. With so many other bodies interested in the Southern Ocean and clear evidence that most of the physical oceanographers opted for SCOR rather than SCAR as a forum, the Delegates decided to close the WG and formally invite SCOR to undertake the main responsibility for future physical and chemical oceanography in the Southern Ocean. It was to be another 25 years before SCAR again dipped its toes in the Southern Ocean, both because scientific interest had changed and probably because the new Executive Director was an oceanographer!

Glaciology

The glaciologists continued to find it more convenient to meet away from the main SCAR meetings but were sufficiently enthused by progress to organize two major symposia on Antarctic glaciology. The 3rd International Glaciological Symposium was organized at Ohio State University in September 1981. This proved popular with 94 papers presented, 21 of them as posters, under eight headings ranging from ice sheet stability and sea ice through to atmospheric and surface processes. In reviewing the 60 papers finally published in the symposium volume Gordon Robin remarked on how they demonstrated the

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emergence of a systematic and mature phase in Antarctic glaciology, with a wide range of complex and demanding field studies supported by advanced and sophisticated laboratory analyses.

The 4th symposium was hosted in Germany at AWI in Bremerhaven and organized by Heinz Kohnen in September 1987. Again its major papers were published in a volume of *Annals of Glaciology*, as they had been for the previous meeting in Ohio. This decision to use the journals for publication rather than a stand-alone volume was in sharp contrast to both the geologists and the biologists. In opening the symposium Gotthilf Hempel noted that the papers for the meeting showed how major steps were being made in deep drilling, developing more complex computer models for the ice sheet, satellite altimetry and what it could contribute to mass balance studies, and the role of GPS in studying glacial movement. This Symposium was the first with an associated trade exhibition.

Meeting in Iceland in 1985, at a symposium on glacier mapping and surveying, the WG briefly reviewed progress with four major programmes: GAP, the Filchner-Ronne Ice Shelf Programme, Antarctic sea ice and the Iceberg Observing Programme. After eight years Colin Bull (USA) resigned as chairman and was replaced by Olav Orheim (Norway). At an informal meeting the following year members agreed that there was an urgent need to acquire as much satellite imagery as possible but recognized that the images were expensive. An *ad hoc* group of seven SCAR nations decided to work together and pool their resources which meant that by January 1987 Orheim could report that 138 new images had been ordered covering the whole perimeter of the Antarctic and the major ice streams.

Group of Specialists on Antarctic Climate Research

A new Group of Specialists on Antarctic Climate research was formed in 1980 with K Kusunoki as Convener and Ian Alli-

son as Secretary, providing a close link to the Glaciology WG. Its principal objective was to prepare an implementation plan for climate research based on the report *Basis for Action Plan on Antarctic Climate research* originally presented by Morton Rubin at XVI SCAR. Meeting in Leningrad in 1982, the group rapidly sprang into action. They identified several immediate activities including the need to co-ordinate climate data management and to deal more effectively with data reporting from automatic weather stations. In addition they asked that more ocean and sea-ice zone data buoys be deployed, that sea-ice observations be included in BIOMASS cruises and other voyages and that international collaboration was needed to develop compatible satellite elevation data sets for calculating mass balance changes. They extensively revised the earlier report and, in discussions with WCRP, a new document, edited by Ian Allison, was published in 1983 as *Antarctic Climate Research: Proposals for the Implementation of a Programme of Antarctic Research contributing to the World Climate Research Programme*.

Upper Atmosphere Physics

A joint COSPAR/SCAR workshop on "Satellite observations of the Antarctic: past present and future" was organized in 1984 in Graz, Austria, and later published in *Advances in Space Research*. At their meeting at XIX SCAR the Working Group organized several special sessions including the Nagata Symposium on geomagnetically conjugate studies, a data analysis workshop and a workshop on middle and upper atmosphere physics as well as their business meeting. Much of the initiatives within this field continued to come from the global organizations like SCOSTEP or IAGA with the SCAR WG providing a forum for commenting on progress within the continent.

Science in the Snow



Above: Examining ice stratification in the wall of a pit at the German Kohnen Station, Dronning Maud Land. Photograph: G Truafetter, Alfred-Wegener-Institut.

Below left: Shallow coring on the polar plateau during the Indian traverse to the South Pole (November 2010). Photograph: Rasik Ravindra.

Below right: Working on the deep ice core at the Japanese Dome Fuji Station (77°19'S, 39°43'E, 3,190 m above sea level). Photograph: National Institute for Polar Research.



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Above: Lou Albershardt (University of Wisconsin, USA) with an ice core from a 90 m drill hole taken during the Trans-Antarctic Scientific Traverse Expeditions – Ice Divide of East Antarctica (TASTE-IDEA). Photograph: Stein Tronstad.

Below: Erin Pettit about to hoist a power drill to the top of a 30 m ice cliff where her colleagues will drill holes for instruments to measure the temperature, movement and melting of the vertical face of Taylor Glacier. Photograph: Kristan Hutchison / NSF.



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Above: Geoffrey Morley using a large chainsaw to cut into the sea ice in McMurdo Sound to study the speed and direction of ice cracks. Photograph: Emily Stone / NSF.

Below: Robert Mulvaney taking measurements from an ice core in the cold room at BAS HQ Cambridge. Photograph: Pete Bucktrout / BAS.



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Above: Russian glaciologist Vladimir Lipenkov in the ice-core store at Vostok Station. Photograph: Arctic and Antarctic Research Institute, St Petersburg.

Below: Russian sea-ice biologist Igor Melnikov standing on the sea ice beside the *Akademik Fedorov* in Antarctica. Photograph: Russian Antarctic Expeditions.

