

International Council of Scientific Unions

# SCARreport

No. 6

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# **SCAR Report No. 6**

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### **XIth Antarctic Treaty Special Consultative Meeting**

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**Recommendation XV-1.**  
**Comprehensive measures for**  
**the protection of the Antarctic environment and**  
**dependent and associated ecosystems**

The Representatives,

*Convinced* of the need to preserve the Antarctic Treaty system so as to ensure that Antarctica does not become the scene or object of international discord;

*Bearing in mind* the special legal and political status of Antarctica and the special responsibility of the Antarctic Treaty Consultative Parties to ensure that all activities in Antarctica are consistent with the purposes and principles of the Antarctic Treaty;

*Recalling* the designation of Antarctica as a Special Conservation Area;

*Recognizing* the vulnerability to human interference of the Antarctic environment and its dependent and associated ecosystems;

*Recognizing further* the unique opportunities Antarctica offers for scientific research on processes of global as well as regional importance;

*Taking into account* international concern for the environment and the importance of Antarctica for the global environment;

*Bearing in mind* the substantial body of measures adopted by the Antarctic Treaty Consultative Parties in recognition of their special responsibilities for the protection of the Antarctic environment and its dependent and associated ecosystems;

*Recalling* in this context Articles V and IX (1) (f) of the Antarctic Treaty and Recommendations setting out general principles for the protection of the Antarctic environment;

*Recalling also:*

- (a) the Agreed Measures for the Conservation of Antarctic Fauna and Flora and associated Recommendations;
- (b) the Convention for the Conservation of Antarctic Seals (which entered into force on 11 March 1978);
- (c) the convention on the Conservation of Antarctic Marine Living Resources (which entered into force on 7 April 1982);
- (d) the Convention on the Regulation of Antarctic Mineral Resource Activities (which has not yet entered into force);
- (e) Recommendations relating to:
  - i. the Antarctic Protected Area system concerning Specially Protected Areas, Sites of Special Scientific Interest and Historic Sites and monuments;
  - ii the Code of Conduct for Antarctic expeditions and station activities;
  - iii the effects of Antarctic tourism and non-governmental expeditions;
  - iv the use of radio-isotopes;
  - v oil contamination;
  - vi the prohibition on the disposal of nuclear waste; and
  - vii environmental impact assessment procedures;as well as work undertaken in relation to the uses of Antarctic ice;

*Taking note* of proposals made at XVth Consultative Meeting by France and Australia for a comprehensive Convention for the Protection of the Antarctic Environment which would establish Antarctica as a natural reserve, land of science; by the United States for comprehensive measures building on the components of the Antarctic Treaty system; by Chile on comprehensive measures, which include the development of the concept of Antarctica as a Special Conservation Area; by New Zealand for comprehensive measures constituting an integrated and binding environmental protection regime; and by Sweden relating to common elements for environmental protection;

*Welcoming* the further substantial progress made on the protection of the Antarctic environment and its dependent and associated ecosystems through the work of this Consultative Meeting including the adoption of Recommendation XV-3 on Waste Disposal; Recommendation XV-4 on the Prevention, Control and Response to Marine Pollution; Recommendation XV-5 on Environmental Monitoring in Antarctica;

Recommendation XV-6 on New Sites of Special; Scientific Interest; Recommendation XV-8 amending Article VIII of the Agreed Measures to provide for Management Plans for SPAs; Recommendation XV-9 on development of improved descriptions and management plans for Specially Protected Areas (SPAs); Recommendation XV-10 on Establishment of Specially Reserved Areas; Recommendation XV-11 on Establishment of Multiple-use Planning Areas; Recommendation XV-14 and XV-15 on promotion of the international scientific cooperation; Recommendation XV-17 on the Siting of Stations; Recommendation XV-19 on Charting of Antarctic waters; Recommendation XV-21 on Antarctic Ice and the Declaration on the Ozone Layer and Climate Change;

*Acknowledging* the need, in the light of the unique qualities of Antarctica and increasing human activities there, to ensure the effective implementation, coordination and further elaboration of the system of protection of the Antarctic environment and its dependent and associated ecosystems;

*Recommend* to their Governments that:

1. They undertake as a priority objective the further elaboration, maintenance and effective implementation of a comprehensive system for the protection of the Antarctic environment and its dependent and associated ecosystems aimed at ensuring that human activity does not have adverse impacts on the Antarctic environment or its dependent or associated ecosystems or compromise the scientific, aesthetic or wilderness values of Antarctica.
2. To contribute to this objective, a Special Antarctic Treaty Consultative Meeting be held in 1990 to explore and discuss all proposals relating to the comprehensive protection of the Antarctic environment and its dependent and associated ecosystems.
3. In addressing the requirements of such a comprehensive system, they:
  - (a) have regard to the principles for the protection of the Antarctic environment and its dependent and associated ecosystems already established under the Antarctic Treaty system and shall consider the need to elaborate further, expand and supplement those principles;
  - (b) review the existing body of measures for the protection of the Antarctic environment and its dependent and associated ecosystems in order, *inter alia*, to:
    - i identify those measures which should be updated, strengthened or otherwise improved;
    - ii identify areas where the existing measures should be supplemented;
    - iii consider the nature of the legal obligations contained in existing measures and the need, as necessary, to state those obligations with greater precision;
    - iv make provision for the promotion of research related to environmental management decisions;
    - v promote the establishment of procedures for assessing the possible impact of human activities on the Antarctic environment and its dependent and associated ecosystems in order to provide for informed decision-making as to their acceptability;
    - vi promote the establishment of procedures to monitor the effectiveness and adequacy of environmental protection measures;
    - vii consider the role of an information and data base for the effective implementation, revision and extension of environmental protection measures;
  - (c) consider if and to what extent institutional arrangements may be necessary and the form or forms of the legal or other measures needed to ensure the maintenance, integration, consistency and comprehensiveness of the system of protection of the Antarctic environment and its dependent and associated ecosystems.

## **Opening Statement by the President of the Scientific Committee on Antarctic Research (SCAR)**

**Dr R M Laws**

Mr President, Delegates and Observers,

I would like to join the other delegates in congratulating you on your election as President of this meeting. I speak as President of SCAR and SCAR greatly appreciates the invitation extended to us to participate in this special Consultative Meeting as an observer and particularly thanks the Government of Chile. I also appreciate the remarks of IUCN and reciprocate them.

SCAR is pleased that several delegates have referred to the need to give priority to science and a specific role for SCAR. Unfortunately some delegates will not know what SCAR is.

SCAR, the Scientific Committee for Antarctic Research is a component of ICSU - the International Council of Scientific Unions - which promotes international scientific activity in all branches of science world-wide, and its application for the benefit of humanity. ICSU is a non-governmental organization representing scientific academies and research councils, which are multi-disciplinary, and scientific unions which are international disciplinary organizations. Currently there are twenty-four national members, seven ICSU scientific union members and four associate members.

The scientific work of SCAR is conducted by eight permanent working groups with national members and five groups of specialists (whose members are appointed by SCAR for their experience and expertise). These groups report to SCAR.

SCAR is charged with the initiation, promotion and coordination of scientific research in Antarctica. It is the single international interdisciplinary non-governmental organization which can draw on the experience and expertise of an international mix of scientists across the complete scientific spectrum. It is therefore, the obvious source of advice on a wide range of scientific questions and is ideally placed to provide answers.

For over thirty years, in fact, SCAR has provided such advice to the Antarctic Treaty System and made numerous recommendations on a variety of matters, most of which have been incorporated into Antarctic Treaty instruments. Foremost among these must be advice on the ecology and environment of the Antarctic and measures for their protection.

But, Mr President, Antarctic science also has a critical role extending far beyond the Antarctic. It has been long known that the Antarctic offers unique opportunities for research in a variety of disciplines which contribute to understanding problems outside the Antarctic. In recent years it has also come to be accepted that research in the Antarctic, including the Southern Ocean and the sub-Antarctic islands, is crucial in its contribution to understanding global change, a development which affects all human beings. For example, the core programmes have been identified for the Antarctic component of the International Geosphere-Biosphere Programme (IGBP) and include:

- detection and prediction of global change;
- study of critical processes linking Antarctica to the global system;
- provision of information on the history of environmental change;
- assessment of ecological processes and effects.

The objectives of these investigations are to describe and understand the interactive physical, chemical and biological processes that regulate the total Earth system, the unique

environment that it provides for all life on Earth, the changes that are occurring and the manner in which they are influenced by human actions. The subject has a relevance far beyond the confines of the Antarctic. It includes global warming and the thinning of the ozone layer.

Mr President, SCAR's record speaks for itself. Antarctica has long been described as a continent for science and more recently as a land of science. If this is a serious concept, weight should surely be given to independent scientific views as I have tried to show in this brief statement. SCAR is the single organization which represents all shades of Antarctic science. SCAR is committed to environmental conservation but Antarctic scientists are very concerned that steps may be taken unwittingly which seriously limit their ability to conduct basic research, actions which could have serious consequences, not just for Antarctica but, as I have indicated, for the world. They are also concerned that SCAR may be replaced as the main body advising the Antarctic Treaty System on the scientific aspects of environmental matters.

Mr President, successful environmental protection measures depend on a good appreciation of the underlying science and Antarctic scientists are needed to evaluate proposals for protected areas. The SCAR Group of Specialists on Environmental Affairs and Conservation was formed to provide scientific advice and its chairman, Nigel Bonner, is present as a SCAR observer at this meeting.

In conclusion, Mr President, SCAR urges the ATS meetings to continue to draw upon SCAR to provide such advice and asks that a way be found to ensure that the minimal constraints - consistent with realistic environmental protection - be imposed upon scientists, bearing in mind their essential contribution to solving not only Antarctic but global problems.

Thank you Mr President.

## **Presentation by the President of the Scientific Committee on Antarctic Research (SCAR)**

**Dr R M Laws**

Mr President and Delegates, I am speaking on behalf of working Antarctic scientists many of whom have wholly dedicated their careers to Antarctic Science. SCAR, a Committee of the non-governmental International Council for Scientific Unions (ICSU), has noted with some concern that only half of the opening statements actually gave support to science and only four Delegates specifically mentioned SCAR, despite its long track record of Antarctic science in support for the Antarctic Treaty System (ATS) - and despite repetition of the phrase "Land of Science" as describing the Antarctic. Also, the SCAR scientists are concerned that a significant proportion of Delegates have little direct knowledge of the Antarctic, its environment and the research carried out there. So I would like first to draw your attention to the SCAR information package distributed to Delegations here and to the circular announcing the Antarctic Science Conference to be mounted in September 1991 by SCAR. We hope that many of you will be able to attend, and the last two days will be devoted to interactions between scientists and policy workers, research managers and other groups (including the media) interested in the Antarctic. The primary objective of the conference is to foster public awareness of the importance of Antarctic Science, particularly in relation to global problems.

SCAR has been an important element in the success of the ATS to date, particularly by giving independent scientific advice on environmental matters, which is the basis of many of the recommendations of ATCMs over the past 30 years. I would like to summarize the activities of some of the scientific groups in SCAR, showing their relevance to the protection of the Antarctic environment and ecosystems, as well as to global problems.

SCAR has always attached the highest importance to the protection of the Antarctic environment. Initially this was done through the SCAR Working Group on Biology, where the first drafting of what was to become the Agreed Measures for the Conservation of Antarctic Fauna and Flora (1964) was carried out. A series of papers on topics of conservation and environmental protection were prepared. Proposals for new Special Protected Areas and Sites of Special Scientific Interest are routinely assessed. During 1988 a Group of Specialists on Environmental Affairs and Conservation (GOSEAC) was constituted, in recognition of the increasing importance being attached to these matters. This has a wide membership, having representation from geologists, geographers and logistic experts as well as biologists. In view of the heightened interest in environmental affairs, GOSEAC meets every year. Its current chief tasks include a special study of the role of environmental impact assessment in the protection of the Antarctic environment and a revision of the booklet *"A Visitor's Introduction to the Antarctic and its Environment"*.

SCAR having recognized the ICSU International Geosphere-Biosphere Programme (IGBP) to be potentially the most significant global scientific programme of the coming decade, appointed a Steering Committee in 1988 to develop proposals for an Antarctic contribution. The resulting document *"The role of Antarctica in Global Change"* was distributed at the XV ATCM in Paris, 1989, so I will not elaborate here except to say that the Antarctic, including the continent and the Southern Ocean with the sub-Antarctic islands, is a critical area in the global change studies conducted by the international scientific community.

The SCAR Working Group on Biology has promoted international collaboration in research on Antarctic biology. The Antarctic provides unique opportunities for the study of biological processes under unusual environmental conditions such as extreme cold and

extreme seasonal and daily light cycles. The region is ideal for the study of dispersal and colonization across great expanses of ice and ocean. Relatively young terrestrial and inland water ecosystems, in which single species are often very abundant, can readily be studied. Their relative simplicity provides unusual opportunities for improving understanding of basic principles which may be applied more widely. The Southern Ocean with its pack ice zone is a most unusual and highly specialized habitat, with ecosystems of great intrinsic scientific interest and resources of commercial value, such as krill, squid and fish. Past exploitation of these resources, particularly the baleen whales, has caused perturbations that unintentionally provide a unique large-scale scientific experiment.

The Working Group on Biology has responded to the periodic requests from the Antarctic Treaty Parties for scientific advice on specific matters such as conservation, use of natural resources, man's impact on the environment, facilitation of scientific research, guide-lines for experimental research on living animals, pollution and tourism.

The SCAR/SCOR BIOMASS Programme (Biological Investigations of Marine Antarctic Systems and Stocks) is a major collaborative effort of scientists from many nations concerned with providing an adequate body of knowledge for the wise management of the living resources of the Southern Ocean. This international programme began in 1976 and grew out of the scientific community's concern for maintaining the delicate ecological balance in the oceans surrounding the continent of Antarctica. The foundation of the Antarctic ecosystem is krill, potentially a major human food resource. Krill, however, are crucial to the Antarctic food chain, providing food for the higher species including whales, seals, penguins, fishes and squid. The overall programme initiates, combines and draws together marine scientific studies of participating nations. Scientists exchange information in workshops and make plans for joint expeditions and for data management. Two multi-ship, multi-national cruises took place in 1981 and 1984-85 and an International Data Centre has been created.

The BIOMASS programme has been an important source of information for the Scientific Committee of CCAMLR (the Commission for the Conservation of Antarctic Marine Living Resources). (A complementary group has been set up by SCAR to consider aspects of the terrestrial and inland water ecosystems, known as BIOTAS (Biological Investigations of Terrestrial Antarctic Systems)).

Major international programmes in physical oceanography and meteorology of the Southern Ocean and its sea-ice zone are now in progress within the World Ocean Climate Experiment (WOCE) and other IGBP activities. These programmes include the Antarctic ocean and have a strong need for the integration of studies of biological systems in relation to the environment.

The SCAR Group of Specialists on Southern Ocean Ecology was established jointly with SCOR (the ICSU Scientific Committee on Oceanic Research). It acts as a forum for review and coordination of on-going and new activities in Southern Ocean Ecology and related fields. In this function, the Group has developed a scientific framework for the establishment of an international interdisciplinary research programme on the Ecology of the Antarctic Sea-Ice Zone. This Group of Specialists also acts as a specific body within the SCAR structure to respond to requests for scientific advice from the ATS, including CCAMLR. The Group can also advise on the possible impacts on marine ecosystems from fishing and from potential mineral and hydrocarbon exploitation.

The Antarctic seals are more abundant, in terms of numbers and biomass, than all other seals in the world combined. The SCAR Group of Specialists on Seals is interested in research on all aspects of the biology of Antarctic seals. A major scientific objective is to use measures such as growth rates, survival, foraging areas, feeding depths, and general health as indicators of ecosystem conditions. This work is particularly important in the face of commercial harvesting of fish and krill, and the increasing pressures of tourism and other human activities. This Group of Specialists enables SCAR to discharge its



responsibilities under the Convention for the Conservation of Antarctic Seals (CCAS). The Group also responds to requests for advice from the Scientific Committee of CCAMLR, particularly in respect of ecosystem monitoring and the effects of marine debris.

The SCAR Working Group on Geodesy and Geographic Information is concerned with the mapping of Antarctica in its widest sense. This includes the geodetic configuration (i.e. size, shape and gravitational field) of Antarctica as well as the coordination of geographic information. In this last respect the Group recently published for SCAR *"Antarctica: a catalogue of maps and charts"* which is a catalogue of all topographic and thematic maps published by SCAR nations. The Working Group coordinated a five nation Antarctic GPS (Global Positioning System) Pilot Project which acquired the field data during the 1989-90 austral summer. It is also supporting a project to provide an accurate and up-to-date digital database for a map of Antarctica at a scale of 1:250,000. This will include data on the coastline, rock outcrops, altimetry and bathymetry from all available sources. It can be used by all SCAR nations to provide an international standard map of Antarctica at a variety of scales.

The SCAR Working Group on Glaciology is concerned with Antarctic snow and ice in all its various forms, from atmospheric drift and precipitation over the plateau of the inland ice sheet to the outer reaches of the pack ice zone. Studies include physics and chemistry of the ice sheet to reveal ice sheet dynamics, past and present atmospheric composition, particularly in terms of climate change and the levels of "greenhouse" gases, and as a baseline for monitoring global pollution; ice thickness measurements to determine stability of the ice sheet with its potential for affecting global sea level; the variability in the seasonal growth and extent of the sea ice which has a significant effect on the total albedo (i.e. reflective property) of the continent and its climate; and the interaction between the ice, ocean and atmosphere. Many of these studies increasingly use remote-sensing techniques, particularly those available in orbiting satellites.

SCAR also has a Working Group on Geology. Although Antarctica is 98% ice-covered, the proportionally small amount of rock is largely concentrated in huge mountain ranges, free of vegetation. Superb exposures commonly display rocks with a freshness and in an extent rarely seen in other parts of the world. This offers possibilities of interpreting less well-displayed phenomena elsewhere on the basis of what can be better observed in Antarctica. Antarctic geologists seek to discover how the continent of Antarctica formed; what are the crustal forces and processes that shaped its past and will continue to shape its future? By studying its rocks and fossils they want to unravel its climatic history and the evolution of the animals and plants that lived on and around it. Answers to many of the constituent problems are beyond the logistic and financial capability of any one nation and SCAR, on the advice of its Working Group on Geology, has set up two Groups of Specialists to promote and coordinate international research into two of these, on the Structure and Evolution of the Antarctic Lithosphere, and on the Evolution of Cenozoic Palaeoenvironments of the High Southern Latitudes.

The Lithosphere is the rigid shell of the Earth. It comprises seven major crustal plates which meet at mid-ocean ridges and some continental margins. It is the relative movement of these lithospheric plates that generates earthquakes and volcanoes. Understanding the structure and evolution of the Antarctic lithospheric plate is critical for all studies of plate interaction on a global scale, for it abuts on four other plates. The relative and absolute movements of the plates are also vital to understanding the palaeoenvironment of the Earth and hence to the understanding of short-term environmental changes of importance to human beings. The main task of this Group of Specialists is to develop an international project to gain knowledge of the continent beneath the ice.

The Group of Specialists on the evolution of Cenozoic Palaeoenvironments (i.e. from about 65 million years ago) was established to promote the integration and correlation of the Antarctic terrestrial and marine palaeoenvironmental records with those of the Southern Hemisphere lower latitudes, and to stimulate the evaluation and definition of important

relevant global events deduced from Antarctic geological research. The Group is actively developing the ANTOSTRAT project which proposes to make a compilation of all available off-shore acoustic data of all types to study the problem of Cenozoic ice-volume changes and their effect on global sea level and climatic variations.

Next, the SCAR Working Group on Solid-Earth Geophysics. Complementary to Geology, Geophysics applies the methods of Physics to understand Earth history, Earth structure and dynamic Earth behaviour. Geophysics is essentially remote-control geology, making indirect measurements of the physical properties of regions that the geological hammer cannot reach. These may lie deep within the Earth, or merely beneath a few kilometres of sea-water, sediments or ice. Why the Antarctic? Essentially, because to ignore Antarctica and the surrounding ocean is impossible. Very many of the problems that concern Earth scientists need to take a global view.

Some of the techniques of Geophysics, as of other branches of Earth Science, are used by industry to prospect for hydrocarbons and metallic minerals. Minerals exploration in Antarctica is a sensitive issue at present, and some are claiming that all Earth Science research is preparation for minerals exploration, and it should therefore be banned. In fact the Earth Science carried out in the Antarctic rarely if ever has the power or spatial resolution of survey required for minerals exploration, and is mainly concerned with targets and regions of not the slightest minerals interest. Data are freely exchanged and published, the only concern being to safeguard intellectual priority, as in any other science.

Turning now from the Earth to its atmosphere - the Working Group on Physics and Chemistry of the Atmosphere encompasses research on Antarctic tropospheric and stratospheric processes, extending from the surface to an atmospheric height of 10 km and from 20 to 50 km respectively. Tropospheric topics include cyclonic storms and the resulting snowfall over the ice sheets, and the unique continent-wide surface wind regimes. Stratospheric aspects particularly include the springtime "Antarctic Ozone Hole" which is believed to be caused primarily by emissions of man-made gases (chlorofluorocarbons or CFCs). With regard to environmental questions the disciplines of concern to the group can provide input in two general areas: Monitoring to provide evidence of both Antarctic and global airborne pollutants; and acquisition of scientific knowledge to understand and to predict the movement and dispersal of pollutants.

Moving higher - the SCAR Working Group on Solar, Terrestrial and Astrophysical Research is concerned primarily with Geospace, surrounding the Earth. The upper atmosphere above about 70 km is a plasma (an extremely thin electrically-charged gas) the Ionosphere, formed under the influence of X-radiation and ultra-violet radiation from the sun. The Magnetosphere is a volume of space near the Earth that is dominated by the magnetic field lines connecting the northern and southern polar regions, which shields the Earth from this radiation. Taken together, the Ionosphere and Magnetosphere are known as Geospace. Radiation and charged particles from the sun - reaching the Earth as the solar wind - interact with the Ionosphere to give auroral displays and disturbances, allowing deep-space phenomena to be studied from the ground. Because it is centred on a land mass (unlike the Arctic, centred on an ocean basin) the Antarctic is particularly well-placed for such studies because scientific stations can be occupied in the region permanently. These studies are very necessary because the magnetospheric shield, like the ozone layer, is crucial to all life on Earth.

Also, with the exception of the immediate vicinity of the stations, the Antarctic continent represents an essentially pristine electromagnetic environment and the natural environmental levels of electromagnetic signals can be studied over a wide range of geomagnetic latitudes. The importance of such measurements is that these measured levels can then be used as the knowledge base for places where the human-produced interference is so large that the natural background levels cannot readily be ascertained.

I submit that this is an impressive (although incomplete) list of the achievements of international science in the Antarctic. This work must not be endangered for the future. In devising legal mechanisms to prevent or control damage to the environment therefore, we need also to assess the possible adverse impact of those measures on the scientific research process. If the restrictions imposed are too severe, Antarctic research will wither and additions to knowledge, of global importance to humanity, will be held back. The virtual cessation of international marine research over the continental shelves of the world - brought about by conditions imposed on marine scientists by governments - should be taken as a strong warning.

Next, I would like to give some perspective to your discussions on environmental impact and to discuss ecological fragility and the actual, very limited, scale of ecological impact by science. (Apart from science, tourism is the only other potential impact on the Antarctic Treaty Area; fisheries impact marine resources and CCAMLR is the agreed control mechanism). "*Fragile*" is a term often applied to Antarctic ecosystems and has been employed by SCAR itself in other contexts, but it is in effect questionable. The Southern Ocean ecosystem has been subject to an enormous perturbation due to commercial whaling and other predator groups have increased to substitute for whale predation on krill. The marine ecosystem is certainly robust not fragile.

On land the vegetation is easily destroyed, like forests in lower latitudes, but it is primarily composed of colonizing plants which more easily renew the plant cover and any destruction is confined to the immediate vicinity of the impact - not spread by fire or flood as in lower latitudes. The Antarctic terrestrial communities are not in fact as fragile as those in many other regions - recovery is slow but sure. The lakes are small and easily affected, but the greatest impact on them is natural fertilization by seal or penguin colonies. Overall Antarctic terrestrial ecosystems are not particularly fragile.

Next "*significant*". What is the scale of environmental impact by science? We need to see this in perspective. The Antarctic, with a land area of 14 million km<sup>2</sup>, is one tenth of the Earth's land surface; it is a vast region. If the average population density of the rest of the world obtained, Antarctica would hold some 550 million people; even the ice-free (say) 0.5% of coastal areas would hold some 3 million on this basis. The actual population of scientists and their support is 2-3,000 and at that not even year-round. In any case, of the ice-free coastal region, only a tiny fraction is suitable for human installations - with rugged coastlines and very few anchorages or harbours. Most bird colonies are on rugged terrain unsuitable for human building installations. There are no large seal colonies on land in the Treaty area.

Even where there is a station, while the impact may be great, it is extremely localized with a restricted "footprint" probably much less than 1 km<sup>2</sup> on average. Even airborne pollution is limited. For example ten years after the building and occupation of the British Rothera Station, monitoring showed accumulation of heavy metals in lichens - but only to 250 metres away, even downwind. This suggests that local sources at ground level may have a very small effect at a distance; extensive lead emissions from aircraft remain the greatest cause for concern in this respect. As there are about 50 scientific stations, round about 50 km<sup>2</sup> - out of 14 million km<sup>2</sup> - are impacted in this way. (I am told that even the large oil-field at Prudhoe Bay in the Arctic has a "footprint" of roughly 100 km<sup>2</sup> - still very small in the Antarctic context).

Let us next look at some known impacts from industrial installations. I will give a few examples: first, at Svalbard in the Arctic, with an area of 60,000 km<sup>2</sup> there have been active coal-mines for many years, but outside the mining areas the wilderness is apparently unaffected although there are dust layers in the ice. The area of the Antarctic continent is 14 million km<sup>2</sup>. Second, Signy Island in the Antarctic has had a long human occupancy - From 1921 to 1929, 3500 whales were processed at a shore station and a scientific station has been occupied at the same site from 1947 onwards. Recent measurements of hydrocarbon levels show a rapid decrease outside the cove and reach low levels 1.5 to 5

km from the station. Third, an earlier study at Grytviken, South Georgia, has been published. There was intensive whale processing at the whaling station over the sixty years, 1904 to 1964; and subsequently a scientific station was active. Hydrocarbon levels fall off rapidly outside the cove as measured in the 1970s. Again, impacts are very localized.

In fact the major known impacts on the Antarctic are from outside the region. Some examples are: first, CFCs introduced to the atmosphere to the north of the Antarctic led to ozone thinning and the overall influence of increased ultraviolet radiation on biota. Secondly, in Antarctic snow and ice, heavy metals originating elsewhere are widespread, and there are identifiable radio-active layers from atomic bomb tests. Thirdly, effects of global warming due to human impacts outside the Antarctic are predicted to be greater in the Polar regions, with extensive effects on Antarctic ice shelf break up, pack ice extent and fast ice persistence. Fourthly, natural oil seepage, which occurs elsewhere, has not been reported in the Antarctic, but there are volcanoes which erupt occasionally. The last significant event was the violent eruption of Deception Island in 1967 and 1970, which spread volcanic dust over the surrounding area. Fifthly, wandering albatross populations show a sustained 1% per annum decline in the South Atlantic and Indian Ocean sectors. This is evidently caused by the long line fishery for blue fin tuna. A study found 0.4 birds killed per 1000 hooks deployed by foreign fleets around Australia, which implies that 44,000 albatrosses of one species die each year. This is probably the main factor responsible for the observed decline in some albatross populations. Sixth, entanglement of Antarctic fur seals in net collars from fishing operations is similar in incidence to the effect on northern fur seals at the Pribilof Islands, Bering Sea, where there is a significant population decline in progress.

Within the Antarctic, there are natural impacts on terrestrial ecosystems. For example the increasing populations of Antarctic fur seals destroy natural vegetation at Bird Island, South Georgia, Signy Island and even Lynch Island in the South Orkney Islands. The latter is a Specially Protected Area (SPA) under the ATS, and the grass *Deschampsia*, to preserve which it was created, has been largely destroyed by the increasing numbers of Antarctic fur seals which haul out on land. Other natural impacts on the inshore ecosystem include guano and faeces, run off from bird and seal colonies compared with which human sewage is negligible. Ice scour and iceberg ploughing, to depths of 250 metres, are more intensive and widespread than any comparable human activities.

It is in the light of such observations that we should carefully define "significant human impact" in relation to scientific activities in the Antarctic.

What then are my conclusions? I would argue that the very great value of Antarctic science to the world has been clearly demonstrated in recent years. In relation to the vast area of the Antarctic, impacts from scientific activities are currently insignificant overall and likely to remain so. In contrast there is real cause for concern about the possible impact of excessive restraints on scientific programmes. SCAR accepts - and most programmes are implementing - internationally agreed modern environmental impact procedures. Probably 90% or more of scientific activities have low risk characteristics however defined. A simple system should be devised to meet real needs if and when they are demonstrated with minimal bureaucracy. Before drawing it up in rigorous detail there should be an examination of the degree and extent of the likely impacts of scientific and logistic support activities and the controls should be realistically tailored to meet actual problems.

In the light of the acceptance that scientific knowledge is *the* major Antarctic resource, with important implications for mankind; considering that scientific activities are the main target of proposed environmental legislation; in view of the relatively insignificant level of the impacts of science within the Antarctic; the significant impacts of natural processes within the Antarctic, and the demonstrably large extra-Antarctic impacts on the region; and in view of the history of SCAR's sustained contribution to environmental protection; ..... in recognition of all these factors, SCAR seeks a high profile involvement in an advisory

capacity on Antarctic scientific and environmental issues within its competence. It would be wholly wrong for *the* international, interdisciplinary scientific organization to be left out of whatever new arrangements are implemented for comprehensive protection of the Antarctic Environment.

However the system is set up in the future, in the "Land of Science" there must surely be some provision for scientific advice relatively independent of governments. SCAR's record speaks for itself and SCAR is the obvious body to provide that advice. As implied in all the documents presented here, scientific activity is almost all that is to be regulated - for it is clear that, for whatever reasons (economical ones or a ban) commercial minerals-related activities will not take place for a long time, if ever, and conservation of living resources is the responsibility of CCAMLR.

Proposals being discussed include setting up a scientific advisory committee with members nominated and funded by governments, and a small secretariat with adequate resources. The SCAR annual income is small, some \$250,000 a year - tiny in comparison with that of other non-governmental organizations with a vested interest in environmental impact control, and in relation to what is expected of it. Over the years it has provided scientific input to the advantage of the ATS at virtually no cost to that system. If SCAR is to be involved in the new arrangements a relatively small financial contribution from Treaty governments - to be used for holding meetings and workshops - would greatly enhance its contribution and seems only fair. I urge Delegates to give consideration to this.

In conclusion, SCAR does not accept that it should be completely replaced by an inter-governmental Scientific Advisory Committee and should have no high-profile role in any future arrangements. If it is excluded from having a significant advisory role on scientific matters within its competence SCAR will feel free anyway to make its views widely known through the usual channels, through ICSU and National Academies. However, in view of the long cooperative relationship between SCAR and the ATS I would hope that we would not have to take such a line. We have heard a lot of words about a "Land of Science". We now look for appropriate action to give the concept substance.

## **Report on the XIth Antarctic Treaty Special Consultative Meeting by the SCAR observer**

**Mr W N Bonner**

The XIth Antarctic Treaty Special Consultative Meeting (ATSCM) was held in Viña del Mar, Chile, from 19 November to 6 December 1990. Delegations included the 26 Consultative Parties (Ecuador and the Netherlands were admitted to consultative status, but the merging of the German Democratic Republic with the Federal Republic of Germany increased the total by only one) and the ten non-consultative Contracting Parties (Switzerland having signed the Antarctic Treaty). Besides the Contracting Parties, observers were present from the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Scientific Committee on Antarctic Research (SCAR), the Commission of the European Community (CEC), the Intergovernmental Oceanographic Commission (IOC), the International Union for the Conservation of Nature and Natural Resources (IUCN), and the Antarctic and Southern Ocean Coalition (ASOC). The invitation to ASOC, a coalition of some 200 non-governmental environmental protection organizations, of which Greenpeace was the most prominent, was a new departure for an Antarctic Treaty meeting. The meeting was chaired by Ambassador Oscar Pinochet de la Barra, Head of the Chilean Delegation.

The meeting had been convened in response to the Recommendation XV-1 (pp 1-2) from the XVth Antarctic Treaty Consultative Meeting (ATCM) held in Paris in 1989, which called upon the Treaty Parties to explore and examine all proposals related to the comprehensive protection of the Antarctic Environment and its dependent and related ecosystems. This recommendation arose largely from a Chilean proposal at the Paris meeting, and several groups of Contracting Parties had prepared papers which, together with others developed at Viña del Mar, formed the basis for discussion at the XI ATSCM.

It had been widely perceived in the media that the meeting was about whether minerals were to be mined in the Antarctic or whether Antarctica was to become a World Park. Although the mining issue was undoubtedly important the agenda of the meeting went far beyond this. At the time of signature of the Antarctic Treaty in 1959 conservation was not seen as an important issue and the subject received only passing mention in the Treaty. Since that time the conservation and environmental protection measures under the Treaty had been developed in a rather *ad hoc* manner. As a formal system for protecting the Antarctic environment they could be regarded as reasonably effective but they were in need of rationalization and consolidation. There were also gaps in the system. There was, for example, no mention of compliance or liability, or even, explicitly, of environmental inspection, or of an infrastructure under the Antarctic Treaty to make its operation more efficient.

From the point of view of responding to environmental pressures arising from activities currently going on in the Antarctic, these were the issues most requiring attention. The probability of mining in the Antarctic taking place in the next decade or so was generally admitted to be small, though for some delegations, and particularly for some of the environmental pressure groups, the question of mining was an important matter of principle.

Whatever the views on mining in the Antarctic, it was generally accepted that the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), adopted by consensus by all the Treaty Parties at Wellington in 1988, contained some valuable concepts for environmental protection, and many of these were taken up again at the Viña del Mar meeting.

There were two main positions. The first of these proposed the adoption of a new Convention which would incorporate all the existing environmental provisions currently in force under Article IX of the Antarctic Treaty. There would be provision for, *inter alia*, response activity, compliance and liability. To administer the convention a rather elaborate institutional structure would be set up, consisting of a Standing Committee, a Scientific and Technical Committee, an Inspectorate and a Secretariat. Some decision making powers would be devolved from the Consultative Meetings to the Committees. Under the proposed Convention all activities in the Antarctic would be classified as either banned, high-risk, or low-risk. Banned activities would be specified in the Convention. They would include those currently banned under the Antarctic Treaty (military operations, nuclear explosions and disposal of radio-active waste) and any activities relating to mineral resources, other than scientific research. For other activities, until recognized as being in the low-risk category, they would be assumed to be high-risk. Low risk activities would require environmental impact assessment (EIA) by a national authority (though conclusions by this authority could be over-riden by the Standing Committee). EIAs prepared for high-risk activities would have to be forwarded to the Standing Committee for approval or otherwise. The draft Convention makes no mention of the advisory role of SCAR.

Although the protagonists of this approach claimed that such a convention would in no way derogate from or weaken the Antarctic Treaty, others took a different view, on the grounds that since many Treaty measures would be removed to a separate Convention, and some decisions would be made elsewhere than in Consultative Meetings, the Treaty would necessarily be diminished.

The second approach was for a Protocol dealing with environmental protection measures to be appended to the existing Treaty, without changing it or amending it in any way. Such a Protocol could either contain a series of Articles, each dealing in detail with specific subjects, or alternatively be a rather brief document, the Protocol itself, setting out the broad principles under which environmental protection could operate, to which would be attached a series of Annexes, each dealing with subject fields. The proposal for the first of these options provided for an institutional structure that left the ATCMs as the main decision-making body. There would be an Advisory Committee, a Secretariat and an Inspectorate. The EIA provisions would leave assessment with the appropriate national authority, but the assessments could be considered by the Advisory Committee, which could postpone action on the activity under question until after the next ATCM, so as to give a chance for further revision. Like the proposed new Convention, this version of the Protocol would ban all mineral resource activity in the Antarctic.

The other version of the Protocol option was similar, though the details which had been contained in the body of the Protocol just described would be removed to Annexes. More or less detailed drafts for annexes on the protection of fauna and flora, the prevention of marine pollution, waste disposal and waste management and, perhaps most importantly, environmental impact assessment were available for discussion. The protocol-with-annexes approach made provision for a similar infrastructure of Advisory Committee and Secretariat, but not for a developed inspectorate. It made no mention of banning mineral resource activities.

The opening statements made at the public session of the ATSCM made it clear that there was more common ground between all these approaches than there were differences. All accepted that the consensus method of decision making in the Treaty was too valuable to be discarded. It was accepted also that the role of science in the Antarctic was of fundamental importance, though few Parties stressed the part that SCAR had played in the past and should play in the future in this regard. There was general agreement on the importance of EIA in the protection of the environment, though there were radical differences in the proposed institutional structure for this process. The greatest difference was, of course, on the subject of mineral resource activities. There was considerable support for a total ban, while only a few Parties expressed the view that CRAMRA was too valuable to discard, or

that it would be wrong to foreclose the option of mining Antarctic minerals for future generations. This was to be a subject that defied resolution at Viña del Mar.

Although the proposed draft Convention attracted the support of several Parties, it was clear that the rather pragmatic approach of a protocol-with-annexes appealed to a majority. Such an instrument would be easier to negotiate and could be up-dated more readily. It was certainly clear that the relatively undeveloped drafts submitted for this option provided easier material to work on than the longer and more detailed papers submitted for the Convention and the inclusive Protocol. Quite early in the discussions it seemed likely that the outcome of the Viña del Mar meeting would be a document that would be structured as a protocol-with-annexes and which would combine the best of the papers submitted.

SCAR's main concern at this meeting was to inform the delegations of the vital importance of Antarctic science, not only for its regional sake, but also for its implications for the rest of the world. The importance of protecting the Antarctic environment was recognized. SCAR's role in formulating advice on environmental matters had been crucial to the development of Treaty measures, and this role should continue, whatever infrastructure was decided upon in the instrument that was to emerge from the Viña del Mar meeting.

The President of SCAR, Dr R M Laws, made a lengthy and informative address on these topics (pp 5-11). This was, with one exception, well-received, and delegations which had not thought it necessary to mention SCAR in their opening addresses subsequently began to take more account of the organization. Inevitably, however, much of the discussion was undertaken by diplomats and lawyers without as full an understanding of the realities of the Antarctic environment or of Antarctic science as the task before them demanded. A further role of the SCAR observers was, therefore, that of providing explanatory and illustrative material in relation to points under discussion.

As is commonly the practice at Antarctic Treaty meetings, working groups were set up to examine specific issues. The first of these, under the chairmanship of Dietrich Granow (Federal Republic of Germany), dealt with legal matters, such as basic principles, questions of general obligations, compliance, decision-making, liability, dispute settlement, and, importantly, institutions and infrastructure. The other, chaired by Roberto Puceiro (Uruguay), examined more technical matters, such as might have formed annexes under the second of the Protocol proposals.

It is easier to report first on the second of these groups, since Working Group II produced more concrete results than Working Group I, though the latter is the more crucial in terms of what the new instrument will ultimately be.

Working Group II reached substantial agreement on four papers. The first of these was on the prevention of marine pollution. This was based largely on ATCM Recommendation XV-4, but elaborated so as to introduce more of the language of the International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 (MARPOL 73/78). The fact that the International Maritime Organization had, on 16 November 1990, designated Antarctic waters a Special Area under MARPOL Annexes 1 and 5, required the introduction of material not found in Recommendation XV-4. The paper on marine pollution produced by Working Group II is stronger than Recommendation XV-4 but, if incorporated into a new legal instrument, it would be unlikely to require major operational changes by programme managers, if they already complied with Recommendation XV-4. A relaxation of the restrictions on the discharge of sewage and food wastes within 12 nautical miles of ice-shelves or land by vessels certified to carry fewer than 11 persons is a significant clarification of the situation under Recommendation XV-4, where the matter was addressed only in report language (para. 90, Report of the XV ATCM).

The second document agreed by Working Group II was on waste disposal and waste management. This closely follows Recommendation XV-3, though there is some re-



arrangement and some strengthening, particularly in the field of the obligatory removal of plastic products. The paper refers to the need to take into account any emission standards and equipment guide-lines for incinerators that might be prepared by SCAR. A target date of 1998/99 was set for phasing out open burning. Like the previous document, the new proposal should present few problems to operators already complying with Recommendation XV-3.

The two papers referred to above would affect mostly operators rather than scientists. The other two papers would affect SCAR scientists more directly. The paper on the conservation of Antarctic fauna and flora represents a significant advance on the Agreed Measures. For the first time the "taking" of native plants (which include lichens, fungi and algae) is prohibited throughout the Antarctic, except by permit. "Taking" in the context of plants, is defined as removing or damaging, or attempting to do so, such quantities of plants that their local distribution or abundance would be significantly affected. "Harmful interference" would include the destruction or adverse modification of the habitat essential to species or populations of native mammals, birds, plants or invertebrates. This would be prohibited, except by permit. Invertebrates themselves are not protected, though their habitat is. Permits to take or cause harmful interference could be granted not only for the existing reasons listed in the Agreed Measures, but also to take small numbers or quantities of native mammals, birds or plants as an unavoidable consequence of scientific activities not otherwise authorized (by permit to take scientific specimens, or for museums, etc.), or of the construction and operation of scientific support facilities.

There was considerable discussion on the desirability or otherwise of allowing dogs to be maintained in Antarctica, but the position remains substantially unchanged in the agreed paper, except that the killing of seals for indispensable dog food is now interpreted in the report language as applying only to emergency situations. Some delegations felt that the importation of dogs should be banned; others felt that importation could be justified by the need to introduce fresh stock to maintain genetic diversity. There was no agreement on this issue. The continued inclusion of fur seals and the Ross seal as specially protected species would be referred to SCAR for advice. There is no mention of Specially Protected Areas in the agreed document, this subject being taken up elsewhere.

The fourth paper, on EIA, proved to be the most difficult, and was not in fact finalized until the last day of the meeting, and then with some of its text in brackets, indicating that consensus still had to be sought. At issue was the sensitive question of how to provide proper protection to the environment without creating a system that would impede the timely execution of scientific projects. Considering what a key role EIA played in all the separate proposals it is remarkable that the final document produced follows Recommendation XIV-2 as closely as it does. This is a tribute to the original drafters of the Recommendation and to the SCAR report that gave rise to it. The new paper covers all activities in the Antarctic, and significant changes in activities. Unless an activity is predicted to have little or no impact, an Initial Environmental Evaluation (IEE) would have to be prepared. The content of the IEE is specified and lists of IEEs performed and decisions relating to them would have to be made publicly available. If an IEE indicated that the activity covered would have more than a minor or transitory impact a Comprehensive Environmental Evaluation (CEE) would have to be prepared. This would follow the same lines as laid down in Recommendation XIV-2. The responsibility for completing these procedures would lie with the organizer of the activity and would not apply separately to individuals subject to the organizer's control. There was no agreement on the role that an Advisory Committee, or similar body, might play in EIA, and differing formulations in brackets were included in the text. It could be assumed from the discussions that CEEs would be resorted to only for fairly large-scale logistic projects and rather rarely to science projects. If this were the case, none of the formulations included, which at most required a period of 12 months to elapse between making a draft CEE available and commencing the project in the field, with possible scrutiny by an Advisory Committee leading to a delay till the next Consultative Meeting (likely to be annual in the future), would be unlikely seriously to impede science.

Other matters considered by Working Group II included a paper on fuel management, which will be considered further by COMNAP, and a revolutionary proposal by one delegation to abolish all protected area categories and replace them by a single category, called an Antarctic Protected Area, each one of which would be furnished with an appropriate management plan. The similarity of this proposal to the concept of Antarctic Protected Areas outlined in the SCAR report "The Protected Area System in the Antarctic" produced in 1987 as a response to a request for advice by the Antarctic Treaty, is striking.

Working Group I had a less easy task, since their problems were more conceptual than factual. There was a preponderant view in favour of a Protocol, but it had not been possible to reach agreement on the form of the new instrument. Nor was it possible to reach agreement on the matter of infrastructure, though there was broad support for some form of standing/advisory/environment committee. There was general support for the establishment of a secretariat.

The closest thing to an agreed document from Working Group I was a paper produced on a personal basis by Rolf Trolle Andersen (Norway). This was in the form of a Protocol to the Treaty. It contained a good deal of text on which consensus had still to be negotiated, but revealed a very substantial measure of agreement. The Article on Environmental Principles requires that human activities in the Antarctic shall be planned and conducted so as to minimize adverse impacts on the environment and its specific components. It states that scientific research shall have priority. It further requires that activities shall be planned on the basis of sufficient information to make informed judgements about their possible impacts, and that prior assessments of these impacts should be made. Monitoring would be required to assess the impacts of on-going activities.

Of particular interest to SCAR are references in Article 9 and 10. Article 9 refers to the need for ATCMs to draw on the best scientific and technical advice available, in particular that from SCAR. Again, in Article 10, on the proposed Committee for Environmental Protection, it is stated that the Committee shall invite SCAR and the Scientific Committee of CCAMLR to participate as observers, and that the Committee shall have regard to such advice. SCAR and CCAMLR (and other relevant technical and scientific organizations) would be invited to present their views and to comment on proposals. Such comments would be presented together with the report from the Committee. This report would have to reflect the views of all members and would have to be made publicly available. If these references to SCAR were adopted in the final instrument they would go a long way towards securing SCAR's role as the principal source of independent advice on scientific matters to the Treaty.

Article II deals with Compliance and the following Article with Inspection to promote the protection of the environment. There is no reference to a formal inspectorate. Articles 13 and 14 refer to Response Action and Liability respectively, and Articles 16-18 to various aspects of Dispute Settlement. A schedule to the Protocol deals with Arbitration.

The final product of the Viña del Mar meeting, the Interim Report of the XIth Antarctic Treaty Consultative Meeting (pp 18-21), refers to the Andersen paper, supplemented by the annexes developed by Working Group II, as "a valuable basis for further work" when the meeting is resumed in Madrid in April, 1991. It seems likely that this phrase conceals a large measure of agreement between the parties. With the development of further annexes on subjects such as protected areas, tourism, etc., an instrument could be produced which would achieve the aims of comprehensive protection of the Antarctic environment and, at the same time, satisfy the concerns of SCAR with regard to science referred to above.

If the minerals resources issue can be resolved, perhaps by way of a fairly lengthy moratorium, and if agreement can be reached on the role of the Environmental Protection Committee, it would seem quite possible that a Protocol, and at least some Annexes, could be adopted at the XVI ATCM in Bonn in October 1991. This would constitute the best

possible review of the Treaty, ensuring continued political stability and reassuring the concerns of both environmentalists and antarctic scientists. The Antarctic Treaty Parties must ensure that they do not let this opportunity slip from their grasp.

## **Interim Report of the XIth Antarctic Treaty Special Consultative Meeting**

1. Pursuant to Recommendation XV-1 representatives of the Consultative Parties (Argentina, Australia, Belgium, Brazil, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, Netherlands, New Zealand, Norway, Peru, Poland, the Republic of Korea, South Africa, Spain, Sweden, the Union of Soviet Socialist Republics, the United Kingdom, the United States of America and Uruguay) met in Viña del Mar, Chile, from November 19 to December 6, 1990 to explore and discuss all proposals relating to comprehensive protection of the Antarctic environment and its dependent and associated ecosystems.
2. The meeting was also attended by delegations from Contracting parties to the Antarctic Treaty which are not Consultative Parties (Austria, Canada, Colombia, Czechoslovakia, Denmark, Greece, Hungary, the People's Democratic Republic of Korea, Romania and Switzerland).
3. The following organizations took part in the proceedings as Observers:
  - the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR),
  - the Scientific Committee on Antarctic Research (SCAR),
  - the Commission of the European Communities (CEC),
  - the Intergovernmental Oceanographic Commission (IOC),
  - the International Union for the Conservation of Nature and Natural Resources (IUCN),
  - the Antarctic and Southern Ocean Coalition (ASOC).
4. Mr Edmundo Vargas, Acting Minister for Foreign Affairs of Chile, officially opened the Meeting and delivered the opening address which is reproduced at Annex A [not reproduced here, Ed.].
5. Ambassador Oscar Pinochet de la Barra, Head of the Chilean Delegation, was elected Chairman of the Meeting. After thanking the Delegations for electing him Chairman, Ambassador Pinochet de la Barra welcomed the states acknowledged as Consultative Parties at the Tenth Antarctic Treaty Special Consultative Meeting (Ecuador and the Netherlands). He also welcomed Switzerland which had acceded to the Antarctic Treaty since the last Meeting. The statement of Ambassador Pinochet de la Barra is included in Annex B [not reproduced here, Ed.].
6. The Chairman proposed that Mr Sigisfredo Monsalve, Minister Counsellor, and Mrs Lucia Ramirez, both from the Ministry of Foreign Affairs of Chile, be appointed Secretary General and Assistant Secretary General of the Meeting respectively. This proposal was adopted.
7. The texts of the opening statements delivered by participating delegations and observers are reproduced at Annex C [not reproduced here except for the opening statement by the President of SCAR (pp 3-4), Ed.].
8. The following agenda was adopted:
  1. Adoption of the Agenda
  2. Introduction of proposals on comprehensive environmental protection
  3. Discussion of proposals
  4. Establishment of Working Groups
  5. Terms of reference for Working Group I
  6. Terms of reference for Working Group II
  7. Report to the Plenary by Working Group I

8. Report to the Plenary by Working Group II
  9. Programme for further work
  10. Any other business
  11. Adoption of the Final Report
9. The following documents containing proposals on comprehensive environmental protection were introduced in plenary:
- Indicative Draft of a Convention for the Comprehensive Protection of the Antarctic Environment, submitted by Australia, Belgium, France and Italy (document XI ATSCM/1).
  - Draft Protocol to the Antarctic Treaty on Environmental Protection, submitted by New Zealand (document XI ATSCM/2).
  - Comprehensive Measures for the Protection of the Antarctic Environment and its Dependent and Associated Ecosystems. Outline of a Protocol Supplementing the Antarctic Treaty, submitted by Argentina, Norway, United Kingdom, United States of America and Uruguay (document XI ATSCM/5).
  - Draft Provisions for a Protocol Supplementing the Antarctic Treaty, submitted by the United Kingdom (document XI ATSCM/3).
  - Protocol Supplementing the Antarctic Treaty, submitted by the United States of America (document XI ATSCM/4, Corr. 1, Add. 1, Add. 2 and Add. 3).
  - Comprehensive Measures for the Protection of the Antarctic Environment and Dependent and Associated Ecosystems, submitted by India (document XI ATSCM/7).
10. Two working groups were established by the Plenary:  
**WORKING GROUP I** under the Chairmanship of Mr Dietrich Granow, Head of the Delegation of Germany, and  
**WORKING GROUP II** under the Chairmanship of Mr Roberto Puceiro Ripoli, from the Delegation of Uruguay.
11. The following terms of reference were adopted for Working Group I:  
 Working Group I should identify issues to be considered in elaborating a comprehensive system drawing on the proposals submitted by delegates (Recommendation XV-1 paragraph 1).  
 The issues include e.g.
- Basic principles
  - Obligation/compliance
  - Institutions/infrastructure
  - Decision making
  - Amendment/modification
  - Liability
  - Monitoring/inspection
  - Dispute settlement
  - Relationship to other parts of the Antarctic Treaty System
  - other substantive provisions, including those issues referred to in Working Group II.
12. The following terms of reference were adopted for Working Group II:  
 Working Group II should initiate the review called for in paragraph 3 (b) of Recommendation XV-1, and concentrate on:
- Marine Pollution
  - Waste Disposal
  - Environmental Impact Assessment
  - The Agreed Measures for the Conservation of the Antarctic Fauna and Flora
  - Protected Area System
  - Tourism and non-governmental activity
  - Environmental Monitoring

13. In adopting its agenda in accordance with paragraph 12 above, the Working Group decided to add the following items:
  - International scientific cooperation
  - Use of alternative energy sources to reduce the impact on the environment
  - Fuel management.
14. The report of the Working Group I, presented by its Chairman, was received in Plenary on December 5. The text of the Report is reproduced in Annex D [not reproduced here, Ed.].
15. The report of the Working Group II, presented by its Chairman, was received in Plenary on December 5.
16. In receiving the Report of Working Group II, the Meeting took particular note of the four attached documents on Marine Pollution, Waste Disposal, Environmental Impact Assessment and Conservation of Flora and Fauna. It agreed that these should be attached to the informal draft Protocol (see paragraph 18) as valuable bases for further consideration at the next session of the XIth Antarctic Treaty Special Consultative Meeting. In doing so it was recognized that further work would be needed, primarily of a drafting nature, to avoid duplication and ensure consistency between the Protocol itself and the Annexes.
17. The text of the Report of Working Group II is reproduced in Annex E [not reproduced here, Ed.].
18. Detailed discussion of the various proposals led to the conclusion that there was unanimous support for the need to adopt a new legally binding international instrument for the protection of the Antarctic environment and its dependent and associated ecosystems. Although the proposed texts represented alternative options, there was a considerable measure of agreement as to the general structure of such a legal instrument. A member of one delegation, Mr Rolf Trolle Andersen from Norway, presented, on a personal basis, a single text drawing upon the documents mentioned in paragraph 9 as well as on draft articles proposed in the Working Group I and sub-groups.
19. The Meeting agreed that this draft Protocol and Annexes attached to this Report, reflecting the papers submitted and the discussions at the XIth Antarctic Treaty Special Consultative Meeting, would form a valuable basis for further work to be undertaken at a future session of the XIth Antarctic Treaty Special Consultative Meeting in 1991. It was understood that these texts would not prejudice the position of any government with regard to the issues addressed therein nor any proposals already made.
20. The Meeting noted that the present restraint on mineral resource activities continues. In the context of future work on the issue of minerals activities addressed in Article 6 of the attached Protocol, a number of delegations expressed their strong preference for a permanent ban, others continued to see merit in CRAMRA, but there was a widespread willingness to consider a lengthy prohibition or moratorium. Several aspects of this issue, in particular the circumstances and modalities under which a prohibition might be reviewed or terminated needed further consideration. In regard to a moratorium, it was stressed that internationally agreed arrangements for taking decisions on mineral resource activities should be in place before the need for such decisions arises.
21. In the course of discussion in Working Group I it was proposed that in order to facilitate the operation of the Antarctic Treaty System as a whole, a small secretariat should be established. There was widespread support for this and it was agreed to recommend that a regular Consultative Meeting should give consideration to the

possibility of establishing such a secretariat to perform such functions as the Consultative Meetings may entrust to it.

22. It was also proposed that the process of protecting the Antarctic environment would be assisted if regular Consultative Meetings were held annually, rather than biennially as has been the practice in the past. While this proposal received widespread support, it was felt that it would be proper for such a decision to be made by a regular Consultative Meeting.
23. The Meeting noted that the Director General of United Nations Environment Programme (UNEP) had addressed a letter to the Consultative Parties on the state of ratifications of the 1989 Basel Convention on Control of Transboundary Movements of Hazardous Wastes and Their Disposal which bans the export of hazardous wastes or other wastes for disposal within the Antarctic Treaty area.
24. The text of a letter of 12th October 1990 from Mr Maurice Strong, Secretary General of the United Nations Conference on Environment and Development (UNCED) to the United States Ambassador in Geneva, as representative of the depositary Government for the Antarctic Treaty requesting the views of the Antarctic Treaty Parties "on pollution related problems and status of marine living resources in all marine areas, including specific seas and polar regions, as appropriate" was made available for informal comments. The United States representative informed the meeting that his government would reply to this letter and invited other Consultative Parties to contribute their views to that end.
25. The Representatives agreed that, together with the participation of representatives of international organizations, these developments contributed to fruitful cooperative relations between the Antarctic Treaty System and Specialized Agencies of the United Nations and other international organizations having a scientific and technical interest in Antarctica, in accordance with Article 3 (2) of the Antarctic Treaty.
26. The Meeting agreed, as is customary, to request the Chairman to release a press communiqué.
27. Representatives welcomed the invitation of the Government of Spain to host the resumed session of the XIth Antarctic Treaty Special Consultative Meeting at Madrid in 1991, April 22-30.
28. The Meeting expressed its warm thanks to the Government of Chile, the Chairman of the Meeting, the Secretary General and Assistant Secretary General and their staff.
29. The Interim Report of the XIth Antarctic Treaty Special Consultative Meeting was adopted by consensus. The Meeting was adjourned on 6 December 1990.





## **SCAR Report**

*SCAR Report* is an irregular series of publications, started in 1986 to complement SCAR Bulletin. Its purpose is to provide SCAR National Committees and others directly involved in the work of SCAR with the full texts of reports of SCAR Working Group and Group of Specialists meetings, which had become too extensive to be published in the *Bulletin*, and with more comprehensive material from Antarctic Treaty meetings.

## **SCAR Bulletin**

*SCAR Bulletin*, a quarterly publication of the Scientific Committee on Antarctic Research, is published on behalf of SCAR by Polar Publications, at the Scott Polar Research Institute, Cambridge. It carries reports of SCAR meetings, short summaries of SCAR Working Group and Group of Specialists meetings, notes, reviews, and articles and material from Antarctic Treaty Consultative meetings, considered to be of interest to a wide readership. Selections are reprinted as part of *Polar Record*, the journal of SPRI, and a Spanish translation is published by Instituto Antártico Argentino, Buenos Aires, Argentina.

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*Polar Record* appears in January, April, July and October each year. The Editor welcomes articles, notes and reviews of contemporary or historic interest covering the sciences and humanities in polar and subpolar regions. Recent topics have included polar aspects of agriculture, archaeology, biogeography, botany, ecology, geography, geology, glaciology, international law, medicine, politics, human physiology, psychology, pollution chemistry and zoology.

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