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QUESTION OF ANTARCTICA

Report of the Secretary-General

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ABBREVIATIONS

ACMRR (FAO)	Advisory Committee on Marine Resources Research
ASOC	Antarctic and Southern Ocean Coalition
BIOMASS	Biological Investigations of Marine Antarctic Systems and Stocks
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCCC (IOC-SCOR)	Committee on Climate Changes and the Ocean
COSPAR (ICSU)	Committee on Space Research
FAO	Food and Agriculture Organization of the United Nations
GIPME	Global Investigation of Pollution in the Marine Environment
IAVCEI	International Association of Volcanology and Chemistry of the Earths
ICAO	International Civil Aviation Organization
ICSU	International Council of Scientific Unions
IIED	International Institute for Environment and Development
IGOSS	Integrated Global Ocean Services System
IMO	International Maritime Organization
IOC (UNESCO)	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange
ITU	International Telecommunication Union
IUBS (ICSU)	International Union of Biological Sciences
IUCN	International Union for Conservation of Nature and Natural Resources
IUGG (ICSU)	International Union of Geodesy and Geophysics
IUPS	International Union of Physiological Sciences
IWC	International Whaling Commission
SCAR (ICSU)	Scientific Committee on Antarctic Research
SCOR (ICSU)	Scientific Committee on Oceanic Research
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
URSI (ICSU)	Union of Radio Science
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment

I. INTRODUCTION

1. On 4 December 1986, the General Assembly adopted resolution 41/88 A on the question of Antarctica. In paragraph 1 of the resolution, the General Assembly requested the Antarctic Treaty Consultative Parties to keep the Secretary-General fully informed on all aspects of the question of Antarctica so that the United Nations could function as the central repository of all such information. By paragraph 2 of the same resolution, the General Assembly also requested the Secretary-General to continue to follow all aspects of the question of Antarctica and to provide an updated report thereon to the General Assembly at its forty-second session.

2. In accordance with resolution 41/88 A, the Secretary-General, on 10 February 1987, addressed a note verbale to the Antarctic Treaty Consultative Parties 1/ and asked them to submit as soon as possible, but not later than 30 April 1987, the views they may wish to express and the information they may provide pursuant to paragraph 1 of resolution 41/88 A. The communication received in response to this note verbale is contained in section II of the present report.

3. In order to prepare the part of the report pursuant to paragraph 2 of resolution 41/88 A, letters were sent on 5 February 1987 to the relevant specialized agencies and bodies of the United Nations as well as to relevant intergovernmental and non-governmental bodies inviting them to submit by 15 May 1987 any updated information they might wish to provide on Antarctica. Section III of the report is based on the information received from these organizations and bodies.

4. It should be noted that because of the strict regulations on the control and limitation of documentation, established in document ST/AI/189/Add.20/Rev.1 of 20 February 1982, the present study only contains a brief summary of and makes reference to publicly available reports on Antarctica provided by some organizations and bodies.

5. The previous reports of the Secretary-General on the question of Antarctica are contained in documents A/39/583, Part I and Corr.1-3, Part II (Vols. I-III) and Corr.1, A/41/688 and Add.1 and A/41/722.

II. COMMUNICATION FROM THE ANTARCTIC TREATY CONSULTATIVE PARTIES

6. On 28 April 1987, in response to the note verbale of the Secretary-General referred to in paragraph 2 of the present report, a communication was received from the Permanent Representative of Australia to the United Nations, acting on behalf of the Antarctic Treaty Consultative Parties. This communication, dated 28 April 1987, reads as follows:

"The Permanent Representative of Australia to the United Nations, acting on behalf of the Antarctic Treaty Consultative Parties, presents his compliments to the Secretary-General of the United Nations and has

the honour to refer to the Secretary-General's note of 10 February 1987 relating to the question of Antarctica.

"The Permanent Representative of Australia has the honour to recall that, before the voting on resolution 41/88 A in the First Committee at the forty-first session of the General Assembly, he made a statement reflecting the views of Antarctic Treaty Parties. The statement noted that, in order to reflect their continuing disappointment at the lack of consensus in the General Assembly's consideration of Antarctica, most of the Treaty Parties had decided not to participate in the voting. The statement noted Treaty Parties' belief that the General Assembly's consideration of Antarctica can proceed usefully and realistically only on the basis of consensus. That remains the conviction of the Antarctic Treaty Consultative Parties and they are therefore not in a position to respond to resolution 41/88 A.

"Nonetheless, as the Consultative Parties have made clear on many occasions, the Secretary-General may be assured that they will continue to provide information about Antarctica to the international community. They have emphasized this both in their responses to previous General Assembly resolutions on this item, which were adopted by consensus, and in the many actions they have taken to provide information about Antarctica and the operation of the Antarctic Treaty system. Such information has been provided on a continuing basis over the years, for example in response to the Secretary-General's note issued pursuant to resolution 38/77. The Parties note that the Secretary-General's report (A/41/722) of 17 November 1986 acknowledges the provision of such information, including under long-standing arrangements to relevant United Nations bodies.

"The Consultative Parties have taken a number of initiatives to make information about the functioning and the achievements of the Antarctic Treaty system readily accessible to the international community in recognition of its increased interest in Antarctica. As pointed out in the Permanent Representative of Australia's note no. 31/86 to the Secretary-General, the Antarctic Treaty Consultative Parties decided at their Twelfth Consultative Meeting to forward to the Secretary-General copies of the final reports of their regular Consultative Meetings. The most recent report, on the Thirteenth Consultative Meeting at Brussels in October 1985, was forwarded to the Secretary-General in November 1985 (A/C.1/40/12).

"At the Twelfth and Thirteenth Consultative Meetings, the Consultative Parties also took further decisions relating to the inclusion of more information in reports of Consultative Meetings; the establishment of National Contact Points to disseminate reports of Consultative Meetings, the Antarctic Treaty Handbook and annual exchanges of information, as well as to provide up-to-date information on the location of depositories of data and information sources relating to Antarctica; the public release of documents from earlier Consultative Meetings; and procedures to enable relevant matters of scientific or technical interest to be drawn to the attention of United Nations specialized agencies or other international organizations.

"In addition, the Permanent Representative draws attention to the statement by the Chairman of the ninth session of the Special Consultative Meeting on Antarctic Mineral Resources, Tokyo, 27 October-12 November 1986, issued as document A/C.1/41/11, and to the reports of the fifth sessions of the Commission and the Scientific Committee of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), which are readily available from the Commission. The final report of the Fourteenth Antarctic Treaty Consultative Meeting, to be held at Rio de Janeiro in October 1987, will be available through the National Contact Points and will also be forwarded to the Secretary-General.

"As will be clear, the Antarctic Treaty Consultative Parties have shown their readiness to respond positively to indications of increased international interest in Antarctica. In fact, they have greatly facilitated dissemination of information about Antarctica. They have also provided a very considerable amount of information to the Secretary-General and will continue to do so. They appreciate all efforts to make such information widely available. They are also confident that the Secretary-General will publicize the fact that in addition to the material provided to him there is a great volume of material on Antarctica available from individual Treaty Parties through National Contact Points, libraries and international data-gathering centres."

III. UPDATED INFORMATION ON THE QUESTION OF ANTARCTICA PROVIDED
BY THE RELEVANT SPECIALIZED AGENCIES AND BODIES OF THE
UNITED NATIONS, AS WELL AS BY THE RELEVANT
INTERGOVERNMENTAL AND NON-GOVERNMENTAL BODIES

7. The following part of the report is based on the updated information received from the organizations and bodies in reply to the Secretary-General's request referred to in paragraph 3. In this connection, it should be noted that some organizations did not respond to the request for information.

A. World Meteorological Organization

8. The Executive Council Working Group on Antarctic Meteorology of WMO held its fourth session at Geneva from 1 to 5 September 1986. Nine recommendations and four conclusions concerning meteorological observations, telecommunication arrangements and climatological aspects in the Antarctic were adopted by the session. These recommendations and conclusions were submitted for consideration and approval to the thirty-ninth session of the Executive Council of WMO held at Geneva from 1 to 5 June 1987.

9. The Tenth Congress of WMO held at Geneva from 4 to 29 May 1987 also considered WMO activities in Antarctic meteorology under agenda item 3.7.2, Antarctic meteorology.

10. The second international Conference on Southern Hemisphere Meteorology (Wellington, 1-5 December 1986) included a session on Antarctic and high-latitude meteorology. Several scientific papers were presented at the session.

B. Food and Agriculture Organization of the United Nations

11. A representative of FAO attended, as an observer, the fifth session of the Commission and the Scientific Committee of the Convention on the Conservation of Antarctic Marine Living Resources at Hobart, Australia, in September 1986. The Scientific Committee at that session expressed its appreciation regarding the successful co-operation between CCAMLR and FAO in the preparation of the CCAMLR/FAO species identification sheets. The representative of FAO at the CCAMLR session was invited to participate regularly in the meetings of the Ad Hoc Working Group on Fish Stock Assessment of the Scientific Committee.

12. The FAO Committee on Fisheries is kept regularly informed of the state of world fishery resources, including the status of stocks in the southern oceans (FAO statistical areas 48, 58 and 88). The most recent paper containing information on such stocks is a document entitled "Review of the state of World Fishery Resources" (COFI/87/Inf.4). It was due to be submitted to the session of the Committee held at Rome from 18 to 22 May 1987. The FAO Yearbook of Fishery Statistics also includes data on the waters around Antarctica.

C. International Civil Aviation Organization

13. ICAO, monitoring the situation of civil aviation in the area of Antarctica, is ready to take action, if necessary, to ensure the safety of civil aviation in the area.

14. At present the formalization of the responsibility for providing air traffic services within a large part of Antarctica by Australia and New Zealand is under review.

15. A representative of ICAO attended a meeting of the Logistics Working Group of the Scientific Committee on Antarctic Research, held at San Diego, United States, in June 1986, at which time aviation matters were discussed. At that meeting, States provided information on their air operations in the Antarctic.

16. The meeting provided the information summarized below.

17. Potential air operations in Antarctica can be classified as commercial flights, logistic flights in support of scientific expeditions, flights as part of the scientific effort and private flights.

18. As far as commercial flights are concerned, none are either operated at present or planned in the near future. Logistic flights to the Antarctic are mainly military flights between Christchurch, New Zealand, and McMurdo Sound. These flights, operated by New Zealand and the United States, operate extensively

between November and February. The Union of Soviet Socialist Republics operates flights between Maputo and the Antarctic. Other flights between South America and Graham Land are operated by Argentina, Chile and the United Kingdom, and number between 100 and 120 flights per year.

19. Most logistic support flying is carried out by light aircraft and helicopters, although the United States operates C130 aircraft between McMurdo Sound and the South Pole. The United Kingdom for the most part operates Twin Otter aircraft for flights between its bases, while other States rely mainly on helicopters, both from land bases and from ships. Other flights, both by fixed-wing aircraft and by helicopters, have been undertaken by private expeditions and non-government agencies.

20. The Logistics Working Group expressed concern with regard to the lack of overall supervision of air operations in the Antarctic. While state-operated flights in support of scientific projects do not cause problems and are well regulated, it was felt that other operations could exceed existing capabilities for air traffic services and communications in the area. In addition, these operations have the potential of interfering with normal operational flights in support of scientific expeditions and exceeding the capacity of search and rescue facilities in the Antarctic.

21. Differing views were expressed on the need or otherwise for ICAO to become involved in developing requirements for the provision of air traffic services and search and rescue services in the area. If the type and amount of aviation activity in the area were to remain at its present level, there appeared to be little justification for ICAO action. The Soviet Union was satisfied with the bilateral agreement with Australia for flights to Soviet bases within Australian flight information regions. The United States did not support a change to the present situation. The United Kingdom, however, favoured the establishment of flight information regions with attendant facilities and services to cover the area. Chile, which at present has an agreement with Argentina concerning flights between South America and Graham Land, believed that the establishment of co-ordinated procedures, the implementation of facilities, an infrastructure of services and an airspace organization was necessary and could be facilitated by ICAO as the international air navigation co-ordinating organization, taking into account the special characteristics and legal status of Antarctica.

22. The meeting decided to form an ad hoc committee to draft a recommendation to be presented to SCAR for study at the next meeting of the Antarctic Treaty Consultative Parties. No information has been received on the outcome.

D. International Maritime Organization

23. IMO suggested that, as far as its involvement in Antarctica is concerned, paragraph 129 of the Secretary-General's 1986 report on the question of Antarctica (A/41/722) should be expanded by including a reference to the 1972 Convention on the Prevention of Maritime Pollution by Dumping of Wastes and Other Matter. The amplified text of this paragraph relating to the protection of marine environment in the southern ocean would read as follows:

"129. There are measures and regulations concerning protection and preservation of marine environment applicable to the southern ocean that have been approved on the global level under the auspices of IMO, UNEP, etc. The measures and regulations developed in IMO include, in particular, those contained in the 1973 International Convention for the Prevention of Pollution from Ships, as modified by the Protocol of 1978 thereto (MARPOL 73/78) and related instruments and standards adopted in IMO. In this connection attention is also drawn to the provisions of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the London Dumping Convention). By decision of the Contracting Parties, IMO has been designated as the competent organization responsible for performing the secretariat duties in relation to the Convention, as set forth in article XIV, paragraph 3. On the regional level such measures have been elaborated within the framework of the Antarctic Treaty (see A/39/583 (Part I), para. 3, Sect. III). These rules and regulations are generally compatible with the United Nations Convention on the Law of the Sea."

E. Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization

24. Since 1970 IOC has been involved in co-ordination of scientific investigations of the southern oceans, initially through the Co-ordination Group for the Southern Oceans (later renamed the Programme Group) and, in 1985, the IOC Regional Committee for the Southern Ocean.

25. The Committee is composed of IOC member States interested in marine Antarctic research, with observers from SCOR, SCAR, ACMRR (FAO), WMO and other interested international bodies.

26. The Group is concerned with all aspects of the southern oceans, with particular emphasis in recent years to the study of general circulation of the southern oceans, the role of the southern oceans in climate changes, marine environment and living resources, development of the ocean observing system and oceanographic data and information exchange. In these activities the Regional Committee maintains close co-ordination with SCAR and SCOR (ICSU), ACMRR (FAO), CCAMLR, IWC, UNEP and CCCO.

27. The IOC Programme Group for the Southern Oceans sponsored a meeting of Experts on Oceanography Related to the Dynamics of the Antarctic Ecosystem (Kiel, Federal Republic of Germany, May, 1984) attended by members of SCOR and SCAR working groups.

28. IOC co-sponsored (with CCAMLR, SCAR and SCOR) the Scientific Symposium on Antarctic Ocean Variability and its Influence on Marine Living Resources, particularly Krill, held in Paris from 2 to 6 June 1987.

29. Within the framework of the World Climate Research Programme, and in particular its major oceanographic component, the World Ocean Circulation

Experiment (WOCE), currently being planned by CCCO, particular emphasis is given to studies of the southern oceans such as the WOCE Core 2 project, The Southern Ocean Experiment. This project is concerned with the Antarctic circumpolar current and its interaction with the oceans to the north.

30. Upon the request of the IOC Regional Committee for the Southern Ocean, the SCOR Working Group 74 has prepared a report on "General Circulation of the Southern Ocean: Status and Recommendations for Research" (WCP-108; WMO/TD - No. 86 October 1985).

31. Several other bodies of IOC deal with various aspects of the study of the southern oceans, namely the IOC Scientific Committee on Global Investigation of Pollution in the Marine Environment (GIPME), Joint IOC-WMO Working Committee on Integrated Global Ocean Services System (IGOSS) and the IOC Technical Committee on International Oceanographic Data and Information Exchange (IODE). Co-ordination of their activities relevant to the southern ocean is provided by the Regional Committee for the Southern Ocean.

32. Upon the recommendation of the Programme Group for the Southern Oceans at its fourth session, the IOC Technical Committee on IODE recommended, at its twelfth session, held in Moscow, 1986, the establishment of the Responsible National Oceanographic Data Centre for the Southern Oceans in Argentina.

33. The fifth session of the IOC Regional Committee for the Southern Ocean was held in Paris from 9 to 12 June 1987. The following major issues were discussed during that session:

(a) Future scientific activities of the Regional Committee on the basis of recommendations of the Seminar on Antarctic Ocean Variability and its Influence on Marine Living Resources, particularly Krill; recommendations contained in the report of SCOR Working Group 74, "General Circulation of the Southern Oceans: Status and Recommendations for Research", and proposals of the Scientific Steering Group for WOCE, particularly those related to the WOCE Core 2 project, The Southern Ocean Experiment, and follow-up activities of the BIOMASS programme;

(b) Development of regional components, the ocean observing systems, including regional components of IOC Global Sea-Level Observing System; IGOSS XBT Ship-of-Opportunity Programme; drifting buoy activities in the region and satellite observations;

(c) Oceanographic data management and exchange of information;

(d) Co-ordination and co-operation with other observational and research programmes in the southern oceans, such as WCRP, GIPME, IODE, IGOSS, as well as the activities of other organizations: CCAMLR, IWC, SCOR, SCAR, WMO, etc.

34. The Regional Committee reviewed scientific research conducted in the southern oceans by member States and international organizations since its fourth session (1984) and formulated its future programme for the next inter-sessional period.

F. International Whaling Commission

35. IWC co-operates with CCAMLR regarding the possible use of whales to monitor the state of the Antarctic ecosystem, especially the krill stocks. IWC and CCAMLR plan to establish a feeding ecology workshop as a jointly sponsored activity. According to IWC, this joint venture will take place in the next 12 to 18 months. It is expected that the workshop will provide a valuable means of drawing together the available relevant information.

36. As in the past, an observer representing IWC attended the fifth meeting of CCAMLR which took place at Hobart, Australia, from 8 to 19 September 1986.

37. At the beginning of 1987, IWC concluded its ninth cruise in the Antarctic to assess the minke whale stocks by sightings. Scientists from six IWC member States participated in this undertaking. The Governments of Japan and the USSR provided the vessels for the cruise.

G. Commission for the Conservation of Antarctic Marine Living Resources

38. The fifth annual meeting of CCAMLR took place from 8 to 19 September 1986, at Hobart, Australia. For the first time in the history of CCAMLR, a special meeting of the Commission was convened, held prior to the regular meeting so that Brazil's notification of 1 August 1986 to seek membership in the Commission could be considered and approved before the expiration of the two-month period under article VII, 2 (d) of the Convention. After the fourth meeting of CCAMLR in 1985, the Republic of Korea and India had become new members of the Commission. In total, 19 members attended the fifth meeting of the Commission. Following established practice, acceding States were invited to attend as observers and Spain, Sweden and Uruguay attended in this capacity. The following international organizations were also represented as observers: FAO, IOC, IUCN, IWC, SCAR and SCOR.

39. The Commission acknowledged its responsibility for the conservation and rational use of Antarctic marine living resources and affirmed that any fishery or related activity within the Convention area must be carried out in accordance with the provisions of the Convention. The Commission noted the limitations of existing knowledge of the Antarctic ecosystem and, in this connection, the role of the Scientific Committee as a centre for consultations and co-operation in the areas of collection, exchange and study of information about Antarctic marine living resources. It stressed the need to ensure that no irreversible long-term damage is done to these resources while comprehensive conservation measures are being developed further. The Commission recognized, in this regard, the importance of developing a process for defining a strategy for the progressive achievement of the objectives of the Convention, as set out in article II, and adopted certain measures to meet this goal.

40. On the basis of the report of the Scientific Committee, CCAMLR decided to keep its conservation measures 1/III, 2/III, and 3/IV in effect. The Commission also

adopted further conservation measures regarding "Regulations on Mesh-size Measurement" (4/V); "Prohibition of Directed Fishery on Notothenia rossii in the Peninsula Area" (5/V); "Prohibition of Directed Fishery on Notothenia rossii around the South Orkneys" (6/V); and "Regulation of Fishing around South Georgia" (7/V).

41. In the light of the adoption of conservation measures 5/V and 6/V, the Commission decided that the catching of N. rossii should be avoided in the Peninsula area (statistical sub-area 49.1) and around the South Orkneys (statistical sub-area 48.2), pending the entry into force of those measures.

42. The Commission was unable to agree upon additional measures to limit fishing in statistical area 48. There was divergence in views, in particular, over limitations of catch in sub-area 48.3. Members carrying out fisheries in this area took the position that any such limitations of catch for the 1986/87 season should be fixed at the level of catch for the 1985/86 season and indicated that they did not intend to exceed those limits. A number of other members took the view that such a catch level was inconsistent with the advice of the Scientific Committee, which recommended steps to ensure recovery of depleted fish stocks. They noted that continued catch at 1985/86 levels would exceed the Scientific Committee's estimate of the replacement yield of stocks assessed by it in 1986. The Commission, however, agreed that additional limitations of catch or equivalent measures should be established for the 1987/88 season at the sixth annual meeting in 1987, when data resulting from planned fishery surveys for sub-area 48.3 would be available.

43. The Commission noted the importance of developing effective procedures for regular catch reporting to permit real time determination of whether limitations of catch had been reached if such limitations were agreed. The Commission called upon parties to concentrate upon this effort prior to and at the next meeting of the Commission.

44. The Commission further endorsed the Scientific Committee's recommendation encouraging co-ordinated surveys aimed at providing independent estimates of fish stocks. In this regard, the Commission took note of the Scientific Committee's stress upon ensuring that methods, timing and location of surveys are appropriate to the requirements of fish stock assessment.

45. On the issue of assessment and avoidance of incidental mortality of Antarctic marine living resources, the Commission took note that information provided by members indicated that incidental and accidental mortality of living marine resources did not appear to be an immediate problem in the Convention Area. At the same time, the Commission recognized that both incidental catch during fishing operations and accidental entanglement in or ingestion of marine debris by fish, birds, marine mammals and other living resources could interfere with efforts to achieve the objectives of the Convention.

46. The Commission reviewed the scientific research exemption provisions and agreed, inter alia, to compile a Registry of Permanent Research Vessels operated by parties that may engage in fishing for research purposes in the Convention area. It also agreed that members who plan to use commercial fishing or fishery support

vessels to conduct fishing for research purposes either in closed areas or seasons, or likely to involve the catching of protected species or size classes, or the use of prohibited gear or fishing techniques, shall notify and provide the opportunity for other members to review and comment on their research plans. Except in unusual circumstances, plans for such research shall be provided to the Secretariat for distribution to members at least six months in advance of the planned starting date.

47. Regarding the system of observation and inspection, according to article XXIV of the Convention, the Commission discussed a paper submitted by the United States and a background paper prepared earlier by the Secretariat. There was general agreement that a system of observation and inspection should be developed and implemented as expeditiously as possible. The Commission subsequently established a working group that would consider the system at the Commission's next annual meeting in 1987. The United States, as co-venet of the working group, agreed to solicit and collate the views of the Commission members on elements to be incorporated into the system of observation and inspection, and to provide a summary of those views to members for use at the working group meeting.

48. On the issue of co-operation with other international organizations, the Commission agreed that it was desirable to improve communication between CCAMLR and the Antarctic Treaty Consultative Parties. The Commission decided that the Chairman of CCAMLR should accept an invitation to the Fourteenth Antarctic Treaty Consultative Meeting and should submit there, in accordance with recommendation XIII-2 of the Thirteenth Consultative Meeting, a report of CCAMLR activities.

49. The Commission also considered the pending request from the Antarctic and Southern Ocean Coalition (ASOC) to attend CCAMLR meetings as an observer. Discussion of the matter revealed a widespread view that there existed a basis for proceeding to conclude an agreement with ASOC, provided that certain clarifications were obtained from it regarding its relationship to its member organizations. Notwithstanding this view, there was objection to moving towards such an agreement and therefore consensus could not be achieved. It was recommended that ASOC's attendance at the sixth meeting of the Commission be decided, on an ad hoc basis, in advance of that meeting. Therefore the Executive Secretary was instructed to offer ASOC the opportunity to complete responses to questions raised in previous correspondence from the Commission. A number of Commission members felt that any such additional information from ASOC would be of assistance in determining their positions on the proposal to invite ASOC to attend the next annual meeting.

50. Detailed recent information on the activities under CCAMLR in the waters around Antarctica may be found in the publicly available reports of the fifth meetings of the Commission and of the Scientific Committee.

H. Committee on Space Research of the International Council of Scientific Unions

51. A COSPAR scientist, designate^d as COSPAR-SCAR liaison representative, participated in the nineteenth meeting of SCAR at San Diego, United States, as an observer.

52. COSPAR provided the following information on space studies related to Antarctica and on areas of common interest established by COSPAR and SCAR scientists.

53. One area of common interest between COSPAR and SCAR scientists is the use of satellites in polar orbit at a height of a few hundred kilometres. Remote sensing of the Earth's surface and atmosphere, using both passive and active techniques across the wide electromagnetic spectrum, is a field of growing mutual interest.

54. The following examples could be given in this regard. The geology of the surface rocks in Antarctica, only 1 per cent of which are directly visible, has been studied from Earth orbit, with the object of mineral exploration. Geodesy is another field that uses satellites: the geoid has been studied by radar altimetry. The topography of the sea-bed, whether mid-ocean ridges or deep trenches, has been found from such studies in the circumpolar ocean. In the field of cartography, satellites provide valuable data. Mountainous features and glaciers are delineated. The position of the ice edge is defined and the movements of icebergs can be tracked. In glaciology, successive Landsat images 10 years apart enable flow lines to be defined. Both the linear and rotational velocities of glaciers can be found. If a radar altimeter mission could be launched and the exercise then repeated in 10 years' time, an answer could be found to the crucial question: "Is the Antarctic ice-sheet increasing or decreasing?" Increased melting of the Antarctic ice would pose a serious problem for the large proportion of mankind who live and work near sea-level.

55. Satellite data are valuable in oceanography, both physical and biological. The extent and character of sea ice can be found, and the break-up of the sea ice under the action of ocean tides and swells are now being studied from remotely sensed data. The regions of enhanced phytoplankton concentration, nutrients for the shrimp-like krill, a valuable resource in the southern oceans, can be identified from space, as can penguin rookeries.

56. The sea surface temperature, a parameter that has been studied globally using space-borne instrumentation, gives indications of biological productivity and also ocean currents. Winds and currents over the data-sparse southern oceans are available from scatterometer radars and from synthetic aperture radars of the type successfully flown in 1978 aboard Seasat.

57. In meteorology, developments in Antarctic weather systems are clearly seen from images taken from space, either in the visible or infra-red part of the spectrum. However, the discrimination between ground and cloud remains a serious problem, both being high-albedo regions. The Earth's radiation budget, which determines patterns of climate, is also a subject of intense study using observations obtained from space. The Antarctic atmosphere is characterized by its lack of local pollution. Nacreous clouds, namely clouds in the stratosphere, are frequently observed from space over Antarctica in winter. Little is yet known of their significance to the Earth's climate.

58. The geomagnetic field is also much studied in space, searching not only for crustal magnetic anomalies but also for the effects of electric currents flowing in

the coupled magnetosphere/ionosphere system. These currents are marked in auroral latitudes. The subjects of ionospheric and magnetospheric physics, and solar-terrestrial physics (the province of SCOSTEP), are finely studied, in situ, using satellite-borne instrumentation. These areas were comprehensively discussed at the plenary session of the nineteenth meeting of SCAR at the San Diego meeting. Images of auroral ovals, both north and south, are now available from the United States Dynamics Explorer-1 satellite. The Swedish Viking satellite, which was launched successfully in February 1986, has obtained high resolution images of parts of the northern auroral oval.

I. Scientific Committee on Antarctic Research of the
International Council of Scientific Unions

59. The nineteenth meeting of SCAR took place at San Diego, United States, from 23 to 27 June 1987. Scientific delegates from 18 countries took part in the meeting as full participants: Argentina, Australia, Belgium, Brazil, Chile, China, France, German Democratic Republic, Federal Republic of Germany, India, Japan, New Zealand, Norway, Poland, South Africa, Union of Soviet Socialist Republics, United Kingdom of Great Britain and Northern Ireland and United States of America. Eight countries were represented as observers: Finland, Italy, Netherlands, Peru, Republic of Korea, Spain, Sweden and Uruguay. In accordance with the SCAR constitution, ICSU members participating in the work of SCAR on a continuing basis, such as IUBS, IUGG, IUPS and URSI, took part in the meeting as union members. Furthermore, several organizations were represented as observers, including CCAMLR, COSPAR, IOC, IUCN, IAVCEI and WMO.

60. The delegates agreed that it was desirable for SCAR to establish a new category of associate membership for countries not in a position to apply for full membership but desiring a close association with SCAR. Such a category would be appropriate both for countries planning to establish an independent national programme and for those with a small number of scientists interested in Antarctic research. To establish such a category would necessitate changes in the SCAR Constitution and Rules of Procedure. Changes in the former required the approval of ICSU and a proposed revised version of the Constitution was agreed upon and transmitted to ICSU for acceptance. Amendments to the SCAR Rules of Procedure were also discussed. It was decided that, after further consideration by correspondence, a new set of Rules of Procedure would be distributed to National Committees for comment and adoption. The meeting expressed the hope that all observer countries represented at it would continue to develop their Antarctic research programmes and would join SCAR as associate members when the revisions to the Constitution had been approved by ICSU. Other interested countries such as Canada, Denmark and Switzerland might also be invited to join SCAR in that category.

61. At its nineteenth meeting, SCAR also discussed the wider implications for Antarctic research of the expanding activities in remote sensing. It was recognized that remote sensing is, in the broadest terms, a tool that can assist a variety of disciplines and that a number of working groups were already dealing with remote-sensing issues. Improved communications between working groups and individual scientists appeared to be the key factor in taking fullest advantage of

remote-sensing activities and new opportunities. Two mechanisms were agreed upon with a view to improving communications.

62. Regarding biology, SCAR confirmed that BIOMASS should be extended to 1989 in order to allow for the completion of data analysis and synthesis. SCAR supported in principle the development of a collaborative programme of Biological Investigations of Terrestrial Antarctic Systems (BIOTAS). The meeting also approved a proposal to establish a small ad hoc group on additional protective arrangements to prepare a response to the first part of recommendation XIII-5 of the Thirteenth Consultative Meeting of the Antarctic Treaty. It further approved the proposals to establish an ad hoc group on environmental data management and to organize a panel of experts on waste disposal. The SCAR Executive also agreed to set up a new SCAR Group of Specialists on Southern Ocean Ecology. SCOR was invited to co-sponsor this Group.

63. The meeting agreed to invite National Committees to convey to their Governments, among other things, SCAR proposals to the Antarctic Treaty Consultative Parties for four new sites of special scientific interest in Antarctica and its wish to resubmit two proposed sites of special scientific interest that had not been accepted by the Thirteenth Antarctic Treaty Consultative Meeting in 1985.

64. It should be noted that the SCAR Working Group on Antarctic Meteorology was disbanded. The meeting stated that routine aspects of synoptic meteorology were now appropriately considered within the WMO Executive Council Working Group on Antarctic Meteorology and scientific aspects under the auspices of the International Commission for Polar Meteorology as well as other organizations. However, it was recognized that modern research in tropospheric physics and chemistry was increasing and that research in boundary layer exchange processes was of growing importance. These subjects may require a full new working group of SCAR, which might be established at the next meeting.

65. With regard to upper atmosphere physics, SCAR encouraged, in particular, the establishment of a specialist working party on the depletion of ozone over Antarctica, requesting it to co-operate with other interested groups of ICSU.

66. The meeting decided that the SCAR Working Group on Logistics should arrange a special meeting in 1987 to consider questions of Antarctic air operations and non-governmental activities.

67. Concerning SCAR publications, the delegates encouraged the SCAR Executive to seek additional opportunities for publications that will further inform the general public about Antarctica. National Committees were asked to submit material, including attractive and informative photographs, that would serve this aim.

68. The meeting adopted measures to meet the requests addressed to it by the Antarctic Treaty Consultative Meetings on the issues of "Antarctic expeditions and station activities: waste disposal" (VII-4), "Man's impact on the Antarctic environment: additional protective arrangements" (XIII-5) and "Facilitation of scientific research: siting of stations" (XIII-6).

69. The nineteenth meeting also discussed different aspects of SCAR's co-operation with CCAMLR, UNEP, IOC, WMO and IUCN.

J. International Institute for Environment and Development

70. In June 1986, IIED convened a conference on "Future Directions for the Management of Antarctic Science". A report of the conference was subsequently published in January 1987. The meeting had the purpose of taking stock of changing directions in Antarctic science and politics, and considering their implications for maintaining the effectiveness of the Antarctic Treaty system. The participants of the conference discussed a broad range of issues dealing with Antarctica and the report lists a number of concrete suggestions on future Antarctic policy-making. In June 1987, IIED published a paper entitled "Report on Antarctica", which covers developments that have taken place since IIED issued its previous report on the same subject in November 1985. This report, inter alia, also provides an analysis of debates in the General Assembly on the question of Antarctica.

K. International Union for Conservation of Nature and Natural Resources

71. The joint IUCN/SCAR Working Group on Long-Term Conservation in the Antarctic issued a preliminary report in 1986 entitled "Conservation in the Antarctic". The report is, at present, under review by IUCN members and the IUCN Council. The joint IUCN/SCAR Working Group was scheduled to meet again in June 1987. A final version of its report will be published by the end of 1988. It should be recalled that the proposed conservation programme is intended for implementation in collaboration and consultation with the Antarctic Treaty Consultative Parties, SCAR, the members of CCAMLR and of IUCN.

72. A representative of IUCN has reportedly been invited to attend the Antarctic Treaty Consultative Meeting in October 1987 at Rio de Janeiro, Brazil, to participate as an observer in the discussion of Antarctic environmental issues. As in the past, since the Convention came into effect, a delegate from IUCN participated as an observer in the fifth meeting of CCAMLR in September 1986 at Hobart, Australia.

Notes

1/ Argentina, Australia, Belgium, Brazil, Chile, China, France, Federal Republic of Germany, India, Japan, New Zealand, Norway, Poland, South Africa, Union of Soviet Socialist Republics, United Kingdom of Great Britain and Northern Ireland, United States of America and Uruguay.
