INTERNATIONAL COMMUNICATION AND CO-ORDINATION IN ARCTIC SCIENCE

- A P R O P O S A L F O R A C T I O N -

prepared at the request of
an informal consultative meeting held in Oslo, Norway
on 13 February 1987, attended by representatives from
Canada, Denmark, Finland, Iceland, Norway, Sweden,
the Union of Soviet Socialist Republics and the United States of America

by a Working Group:

E.F. Roots Ottawa
O. Rogne Oslo
J. Taagholt Copenhagen

17 November 1987

INTERNATIONAL COMMUNICATION AND CO-ORDINATION FOR ARCTIC SCIENCE

- A PROPOSAL FOR ACTION -

Executive Summary

This paper proposes that a committee be established to encourage and co-ordinate scientific activities in arctic regions, and suggests also that governments of arctic nations consider the creation of a continuing mechanism for intergovernmental discussions and liaison on issues related to arctic research and information.

The paper contains five parts.

Part 1, The Present Situation, is a short outline of some features that are important with respect to science in the circumpolar arctic today. It draws attention to the similarities in needs for arctic knowledge that are being felt in different northern countries, and describes some new problems that are arising as scientific knowledge of arctic regions becomes of increasing national importance to northern countries and also to many non-northern countries, and to international relations and activities. These new situations and problems can result in advantages to all countries if there can be increased communication and co-operation in arctic science matters. But the same situations could lead to more difficult national and international problems if scientific knowledge and communication is inadequate.

Part 2, Needs for an International Mechanism for Co-ordinating Arctic Science, draws attention to various specific areas where international co-ordination or co-operation will be of increased benefit in the planning and conduct of science in the arctic, in the exchange of the results of arctic research, and in the development of policies that relate science to other national and international issues.

Part 3, Meeting the Needs, describes some of the features that any body or mechanism should have to meet the international needs outlined. It is proposed that action be taken simultaneously on two levels:

(i) A non-governmental scientific committee provisionally called the International Arctic Science Committee, should be established to promote international co-operation in scientific research in arctic areas. The committee would serve the scientific interests of arctic countries and provide a forum for discussion and co-ordination of the research interests of any country involved in arctic science. It would have as special responsibilities the facilitation of circumpolar studies and the linkage of arctic research to major advances in world science.

(ii) Representatives of governments of arctic nations should discuss the feasibility of establishing a system for regular, structured discussions and liaison on arctic science matters. Such discussions, comprising what might be called an Intergovernmental Forum on Arctic Science Issues, would supplement but in no way interfere with the several bilateral science arrangements presently in existence between arctic countries.

.../2

Part 4, Organizational Outline, presents some desireable features of the proposed International Committee and Intergovernmental Forum:-

(i) It is suggested that the International Arctic Science Committee would be non-governmental but comprised of national representatives. It would be similar in structure and actions to existing regional international multi-disciplinary scientific co-ordination committees of the International Council of Scientific Unions, with which it may in due course seek to be affiliated. Tentative terms of reference and organizational structure are presented for discussion. It is proposed that the Committee would have an international Board to run its affairs; a Council comprising national representatives of all participating countries; specialized Working Groups to be concerned with research in selected areas of international importance; and a small permanent Secretariat in some northern country. The Committee would develop mutually supportive working relationships with existing international bodies that are concerned with arctic science, and avoid competing with them or displacing them.

(ii) The degree of formality or informality of the proposed Intergovernmental Forum on Arctic Science Issues and the governmental level to which it would be accountable, would be determined by the appropriate authorities of the countries concerned. Topics and priorities for discussion would relate to policy aspects of arctic science and international co-operation. The Forum should be a continuing activity, meeting regularly, at a level sufficiently senior to ensure discussion of major international arctic policy issues.

There would be no direct relationship between the proposed International Arctic Science Committee and the proposed Intergovernmental Forum on Arctic Science Issues; but the work of the Committee would provide information and substance to the issues considered by the Forum, and the latter would provide policy references for the former.

Part 5, Next Steps, suggests actions needed to bring about the new developments proposed. The concepts and implications of an International Arctic Science Committee and an Intergovernmental Forum on Arctic Science Issues should be discussed within concerned countries and internationally. After there has been appropriate internal preliminary discussion, another international meeting should be held, attended by national representatives of science authorities to assess the degree of consensus and interest in the proposals. Authorities responsible for foreign affairs may also wish to exchange information on intergovernmental aspects. If these further discussions reveal general interest, an international committee and intergovernmental forum can be established.

INTERNATIONAL COMMUNICATION AND CO-ORDINATION FOR ARCTIC SCIENCE

- A PROPOSAL FOR ACTION

1. The Present Situation

1.1 Arctic countries have many similar problems, and arctic science is important to many countries. Although arctic countries each have distinctive geography, resources, and institutional or social systems, many of the problems with regard to their arctic regions are similar or shared. Similar environmental and natural conditions, shared background and history of the native peoples who now are citizens of separate nations, and the widespread introduction of specialized polar technologies have had the result that today there is much in common around the circumpolar arctic. In many subjects there is more similarity, in natural conditions, in the state of knowledge, and in important problems not yet solved, between the arctic regions of different countries than there is between the arctic and non-arctic parts of the individual countries.

The arctic regions display phenomena whose explanation and understanding are important to world knowledge, and thus research in the arctic, and the sharing of research knowledge about the arctic, is important also to many countries that do not themselves possess arctic territories. Advances in technology, particularly the development of arctic marine transportation capability and new global communications systems, have changed the nature and significance of arctic science for both arctic and non-arctic nations. For these reasons, sharing and cooperation in scientific activities in arctic regions, and international dissemination of arctic knowledge, can bring many advantages to the arctic countries, to the people who live around the circumpolar arctic, and to world science.

1.2 New developments in the Arctic bring new problems. Recent developments in the arctic regions have brought new problems for administration, control agencies and politicians. Each country must deal with these problems in its own way; but many of the problems are similar in several arctic

.../2

countries, and there could be benefit from increased sharing of experiences and, in some cases, co-ordination of action. The knowledge required to address these problems cannot be generated in one country alone but must take into account scientific discoveries or new technologies important to the arctic wherever they occur. Among such problems are:

- protection of the environment, and the important consequences for arctic regions of environmental change resulting from both near-by and far-away causes (acid rain; long-range transport of pollutants; fallout of radioactive contamination; pesticide residues);

- problems connected with the management of both living and non-living natural resources, taking into account the changes in human population of arctic regions, the fluctuations and trends of world markets, the development of new technologies and their economic implications including the enormous investments needed in advance of major resource development; evidence of changing climate and natural habitat, and other environmental factors;

- the rapid increase in numbers of people in arctic regions, because of a dramatic recent increase of native populations in areas that have been settled for a long time, and also because of the migration of adults, or adults with young families to the arctic from southern regions. This rapid change has brought new and mostly unfamiliar social, economic, educational and political problems to the arctic in nearly all circumpolar countries, and in particular, new concerns among indigenous peoples. Accompanying the population increase in arctic regions there has been an increase in per capita use of resources, changes of life style including greater importance of money and wage employment within the socioeconomic system, and rapidly changing personal and political expectations by northern residents;

.../3

- in many arctic areas there are rapid changes of political structures and institutions, requiring new kinds of decisions and policies at the local, national and international level;

- the increasing use of the arctic regions for a variety of purposes, e.g. development of northern industry, arctic sporting expeditions, tourism, etc., which raise new issues of safety and government responsibility, social rights and justice for residents and non-residents, protection of resources and environment for the future, new issues in northern education; etc.;

- the scientific aspects of the increased and changing military and strategic importance of arctic regions, related both to geopolitical developments and to changes in military technology.

1.3 Need for new or improved scientific knowledge. Many of the problems having to do with political, economic or social development in arctic regions, or with protection of the environment, are dependent upon improved scientific knowledge and more accurate information about arctic conditions and resources. The solutions to these problems often require the development of technologies or management practices that are designed for or adapted to the arctic. The improvement of science and research, and access to new scientific knowledge are therefore important to arctic development and the formulation of satisfactory arctic policies.

1.4 Importance of shared knowledge. Each arctic country has a different history, and its own national priorities and decision-making system. Thus each country with arctic territories has developed its own national policies for its arctic regions, and its own way of dealing with international issues that involve or affect those regions. But the policies of all arctic countries must be based on scientific knowledge of arctic conditions and awareness or appraisal of arctic technologies. It is to the benefit of each country, even if its priorities and policies

.../4

differ from those of other countries, to have the best possible scientific knowledge of all the arctic regions. Co-operation with other countries will be more effective if there is sharing of basic knowledge.

1.5 Arctic research is important to world science. The arctic regions present many problems and challenges of great interest to the scientific world as a whole. Many scientific problems of world-wide or fundamental importance require information from high latitudes which can only be obtained through careful, specialized research in the arctic regions. Many non-arctic countries, therefore, have a genuine and legitimate interest in arctic science. Quite independently of the policies of any nation, the development of world science benefits from the advance of arctic research and the dissemination of arctic scientific knowledge.

1.6 Need for liaison and exchange between arctic scientists. In several fields of science there is good contact and exchange between scientists of different countries engaged in arctic research, through international scientific organizations, intergovernmental arrangements, or on an individual basis. In other areas the exchange and communication is poor, and difficult to arrange, because there are no established organizations or because the subjects where communication would be very useful differ between one country and another. As science becomes increasingly specialized, this situation is not likely to improve unless deliberate international steps are taken to facilitate co-operation and sharing of knowledge.

1.7 Need for information from the whole circumpolar arctic. The contacts between Soviet arctic scientists and those of the western nations are limited. Because of this, information is available to each side from only part of the circumpolar region, and some arctic phenomena are not well understood. Some expensive work is duplicated and less effective than it would otherwise be, the advance of science in some areas is handicapped because problems are not defined on the basis of the best knowledge, and researchers in different parts of the arctic regions cannot build on one another's discoveries.

1.8 Arctic science priorities of arctic countries vs. arctic science interests of non-arctic countries. Countries with arctic territories have scientific responsibilities directly related to their national or domestic arctic priorities. These priorities relate to national or regional economic and social development, defence, and protection of the environment in specific arctic areas. The science connected with such responsibilities often must be undertaken to produce results quickly and to contribute to expedient decisions, and less emphasis can be given to studies needed to provide a basis for sound long-term policies. Shorter-term national priorities may pre-empt a substantial part of the arctic scientific resources of countries with arctic territories, leaving limited scientific capacity or institutional support for research on questions of basic science or global problems in arctic regions.

On the other hand, countries that do not possess arctic territories but who recognize the benefits from polar science, can more easily direct their scientific expertise and research resources toward major unsolved scientific problems of the arctic regions. For non-arctic countries, it is often in their national policy interest as well as their general scientific interest to view arctic science in an international context. As arctic science becomes more closely integrated with research activities in the rest of the world, and specialized research in the arctic becomes increasingly important not only for its value to the arctic regions themselves but also as an essential component of global studies, the "international" view of priorities for arctic science becomes stronger and has an influence on the sophistication, technology, and details of arctic research.

This situation leads to a paradox that is becoming increasingly apparent in arctic science today. Non-arctic countries that have a tradition or expertise in polar science, or scientific agencies that are interested in arctic phenomena but which are not occupied with the demands associated with arctic administration, may be in a better position to play a leading

role in research on major arctic scientific problems than countries or agencies with specific national or political arctic responsibilities. Such a paradox carries potential problems for many arctic countries and their "northern" science or research agencies, who are most directly affected by the results of arctic science but who may find the scientific initiative taken by others. These countries and agencies could have much to gain from the results of international research on basic scientific problems of the arctic, but they themselves often have only limited scientific resources for such research. The situation also can lead to problems for non-arctic countries if their scientific activities in arctic regions are regarded by arctic states as pre-empting their own research priorities.

It is in the interest of all arctic countries to encourage the initiative and activities of the scientific world generally, including researchers from non-arctic countries, in the study of important arctic problems; and to share the knowledge or results from such research. Arctic countries have a need to help direct international arctic research in ways that will be most useful to their current arctic problems as well as to fundamental science; in this way the world science community can be of direct assistance to arctic nations. At the same time, each country must ensure that international studies or the initiatives of other nations do not cause it to lose control of its own scientific priorities.

1.9 Interdisciplinary and multidisciplinary nature of arctic research. The progress of scientific knowledge, and the increasing degree to which national and international policy issues are dependent upon or influenced by integrated scientific understanding, has meant that specialized scientific knowledge from various fields of study must be combined, and that many of the most significant new researches must be interdisciplinary or multidisciplinary in nature. This is particularly true for arctic regions. In the arctic, a close relationship between physical and

biological phenomena is an inherent characteristic of natural sciences research. Many of the distinctively arctic problems in the field of social sciences, also, can be pursued effectively only if there is a close link to increased knowledge of the arctic environment and the study of natural resources. In addition, because so many arctic phenomena are imperfectly known, and the interactions or relationships between different phenomena or responses are in many cases distinctly different from those of temperate regions, there is often even more than in temperate regions an intimate link between the theoretical and basic sciences on the one hand and the applied sciences, engineering, economics, medical and health sciences, and studies of social behaviour on the other. The advantages of international co-operation and sharing of scientific information can thus be fully realized only if there is communication and sharing in a wide range of subject fields and disciplines. The present lack of communication between countries in some areas of arctic research and between scientists of different disciplines is a problem not only for those fields of research but is a handicap to effective arctic science as a whole.

1.10 Arctic research is important to world-wide science programmes. A significant development in modern science is the establishment of co-ordinated and integrated world-wide or regional research programmes that cover several specialized fields of study and include various techniques, from satellite surveys to computer modelling and laboratory experimentation. These programmes require the active participation and co-operation of several nations for their fulfillment. The arctic regions play an essential part in many of these studies. Examples are the polar sub-programme of the World Climate Research Programme organized by the World Meteorological Organization, and the Arctic Interactions study contributing to the International Geosphere-Biosphere Programme of the International Council of Scientific Unions. A consistent and co-ordinated response from arctic countries is necessary if these global programmes are to be successful; and the contributing countries must be able to carry out, over a period of years,

their commitments to the sophisticated arctic studies that will be needed. At the same time, co-ordinated planning and communication is needed at both national and international levels to ensure that the demands of the large international programmes can be accommodated within the other national researches in the arctic without unduly distorting them.

1.11 Existing international arctic science organizations. Several bodies and structures already exist to facilitate arctic research or promote international scientific exchange in the polar regions (Appendix 1).

Each of these organizations plays a useful role, in its particular area of interest and responsibility. It is clear, however, from some of the problems described above, that, taken together, the existing bodies and structures do not meet adequately all the needs for communication and co-operation in arctic sciences that are felt by the scientific community or by government agencies. It is also clear that the present informal and ad hoc methods for co-operation do not address the problems of international co-ordination of science management, the knowledge needs of northern peoples whose concerns are in part trans-national, or the issues of national scientific priority in relation to international scientific balance in arctic regions. Nevertheless, the existing bodies, even the informal ones, are very important to arctic science and international relations. If a new or additional mechanism for arctic scientific co-operation is developed, it should not replace or weaken the existing international committees and bodies, but should be designed to strengthen the best of them and make them more effective. It should address the international and national needs that cannot be met by the existing bodies. Some of these needs are outlined in Part 2 below.

1.12 Background. This proposal is the result of many preliminary studies, published papers and policy statements, and discussions within and between countries concerned with arctic science and research. It is the direct outcome of a preliminary international meeting held at San Diego, U.S.A.

on 20 June, 1986, and a subsequent meeting in Oslo, Norway on 13 February, 1987, which was attended by representatives from Canada, Denmark, Finland, Iceland, Norway, Sweden, the Union of Soviet Socialist Republics and the United States of America. A discussion paper tabled at that meeting, entitled "Some Points for Consideration in Discussions on the Need For, Feasibility, and Possible Role of an International Arctic Science Committee", by E.F. Roots and O. Rogne, may be obtained from the Norsk Polarinstitutt, Oslo. Minutes of the Oslo meeting are also available from the Norsk Polarinstitutt.

The Oslo meeting agreed that there are important needs for international co-operation and communication in arctic science which were not met by the international arctic science bodies already in existence, and proposed that a working group of Roots, Rogne, and Taagholt prepare a proposal document that would elaborate on the ideas brought forward at the meeting. This document is the result of our deliberations.

2. Needs for an International Mechanism for Co-ordinating Arctic Science

Despite the large number of multi-lateral and bi-lateral mechanisms for international co-operation with regard to scientific activities in the arctic, concern is still felt that co-ordination and information exchange are seriously lacking. The needs for improvement in co-operation and co-ordination can be grouped into two areas:- those concerned with scientific activities themselves, and those concerned with science policy and administration.

2.1 "Science" needs

2.1.1 An international mechanism is needed to stimulate co-ordinated research on major scientific topics in the arctic; to bring resources and research facilities from several countries together in a coherent or co-ordinated way so that the total scientific effort is more

.../10

effective and economical than if each part were studied separately according to the resources available to each country; to enable arctic phenomena to be studied or monitored systematically in various parts of the whole region when that is necessary; and to achieve an optimum balance and sequential approach to the setting of research priorities for the solution of major scientific problems of the arctic regions.

2.1.2 Because, to an increased degree, scientific information from the arctic regions is needed not only because of the importance of that subject to the arctic itself but because it provides essential data or understanding to a broad national programme or a world-wide study, there is need for a recognized international mechanism to provide linkage or exchange of information between different arctic researches in various countries, or with related or complementary studies in non-arctic areas. Existing scientific information systems do not provide this linkage, except on a narrow disciplinary basis, or in connection with specific short-term tasks or missions.

2.1.3 A distinctive characteristic of arctic research is the degree to which any significant study becomes interdisciplinary or multi-disciplinary in nature or involves specialized studies in several subjects. The various disciplines into which science developed in temperate regions often do not apply very well to polar regions, where physical, chemical, biological and also sociological and economic factors are more closely interdependent at various levels of detail and cannot be satisfactorily studied in isolation from one another. But scientific priorities and the quality of scientific investigation in the arctic as elsewhere are in most cases still judged by the scientific establishment on a traditional disciplinary basis. In order to ensure that arctic research, which is by nature inter-disciplinary, concentrates on subjects of high scientific importance and is of good scientific quality, there is need for a recognized international mechanism for scientific review that can deal directly with arctic research in a holistic manner, including the contributions of several disciplines or of multidisciplinary studies.

2.1.4 There is a need for an established mechanism or continuing international specialized system to facilitate standardization and compatibility of arctic data and measurements. The uniqueness of the arctic environment and phenomena, the difficulties of making sophisticated systematic measurements and the pioneering nature of much arctic research lead to innovation, experimentation and specialized methodologies, with the result that data from various studies of similar phenomena may not be directly comparable. At the same time, there is need for data to be comparable on a circumpolar basis, and for studies in various disciplines to obtain, and use, consistent measurements, data, and terminology. Arctic research poses some special problems in this area which require international attention.

2.1.5 An international mechanism is needed to improve the availability and transfer of scientific data and information resulting from scientific and technical studies on a wide range of arctic topics. For a number of reasons, including the fact that much modern-day arctic research is undertaken by government agencies carrying out national responsibilities, or by private industry, or as part of the work of mission-oriented interdisciplinary teams or task forces, a great deal of the most important and up-to-date scientific information about the arctic does not appear in the peer-reviewed international scientific literature. It is found instead in reports of agencies and specialized institutions, in conference proceedings, and as data in agency or company files. Most of such information is available if one knows about it and knows how to get it; but it is poorly covered by existing bibliographic indexes and reference data banks. An important service to arctic science will be an agreed international mechanism for the identification and exchange of scientific information that does not normally appear through established publications with international distribution.

2.2 "Policy" needs

2.2.1 There is need for a continuing forum through which scientists and administrators from nations with arctic territories and non-arctic nations that have research activities in the arctic can meet to exchange plans and results, co-ordinate programmes or arrange priorities to mutual benefit. Arctic nations often have special national or domestic needs and priorities involving arctic research that are outside the interest of non-arctic scientists or their administrators, and yet the science undertaken by non-arctic nations may be useful to those needs. The science administrators of arctic nations will benefit from access to the broader range of arctic science interests and priorities; and the administrators or support agencies in non-arctic countries whose scientists work in the arctic will benefit from contact with their counterparts in arctic countries who are dealing with similar activities but have different priorities and constraints.

2.2.2 It would be useful if there were an international mechanism whereby the effectiveness and progress of independent national research, and bilateral or multi-national scientific activities in the arctic can be reviewed. Each country is free to undertake its own research, or to enter into bilateral or multilateral arrangements as it wishes; but the planning of research would be facilitated and its effectiveness increased over time if all arctic countries took part in discussions at which the organization, co-ordination and international co-operation could be reviewed and assessed.

2.2.3 There is need for nations undertaking or interested in polar science to develop a common approach to the relationship between scientific activities and the increasing use of polar regions for other purposes, such as recreation, tourism, small exploitive business, etc. These activities, although legitimate, are in many areas placing an increasing and sometimes

unwelcome burden on scientists and administrators. The major and well-established "uses" of the arctic, such as those connected with military or government activities, or the organized development of mineral resources or living resources, while they may present important problems for science or environmental protection, are also major contributors to arctic science, and can be dealt with in an organized way. All arctic countries have developed their own procedures for these major activities. But the small-scale and "spontaneous uses" of the arctic, although often desireable and a source of local revenue and citizen enjoyment, are beginning to pose difficult problems for arctic research and management.

In many areas where tourism or recreation has most appeal, scientific research is at present the main on-going activity. The increase of other "users" of the area brings problems of communications, search and rescue, environmental protection, disturbance of areas being monitored or studied, and ignorant or selfish destruction of arctic heritage. Most of these problems are not within the responsibility or even the competence of the scientists or their agencies; yet the reality is that it often must be the arctic scientists who have to deal with the problems in the field, sometimes to the disruption of their own programmes and causing difficulties for their scientific sponsors. Problems of this nature are further complicated because in several countries the northern residents themselves and the national arctic development policies support and promote such activities; as do, in principle, most of the scientists.

The issue of accommodating or encouraging public, recreational or local entrepreneurial uses of arctic territories in a way that causes minimum disruption to scientific studies or the environment has circumpolar and international dimensions, and would benefit from a body that could discuss these questions and their relation to science planning and operations. It will be desireable, both for science and for local residents or businesses as well as tourists or sportsmen, to avoid major differences between countries in their approach to scientific and non-scientific new activities in arctic regions.

2.2.4 Arctic administrators, each within their own national structures and responsibilities, share some common problems related to science and research. These include

- environmental protection, the setting of standards or guidelines, the enforcement of regulations in areas where very few people live, and the monitoring of environmental changes or the effects of human activities;

- the development of new administrative structures and institutions in arctic areas, with new responsibilities for northern residents, new national and international transitions in arctic cultures and life styles, and new geopolitical priorities;

- the overseeing and approval of development of new arctic technologies, certification or restriction of its use in untried arctic conditions; the setting of appropriate fees or rentals;

- the development, approval and inspection and decommissioning of arctic facilities, laboratories, or installations of any kind.

These and many other problems require that the arctic administrators or authorities be in close touch with developing science in the arctic, and have a means of influencing or directing the research when needed so that the right kind of knowledge is available to meet administrative problems. It is also desireable for administrators to have a means to exchange and compare on a circumpolar basis, to avoid unintentional or unnecessary differences in allowable pollution, discrimination against beneficial technologies, etc. It is therefore desireable to have an international network of communication between arctic administrators on science-related subjects.

3. Meeting the Needs

3.1 If new international action is taken to meet the above needs, whatever is created should as a minimum have the following characteristics:

(a) the new developments should support and enhance national policies of arctic nations with regard to arctic science, and at the same time should help to increase international co-operation and communication, and facilitate the growth and exchange of scientific knowledge on a non-national basis.

(b) all arctic nations should have an equal possibility to take part, and their scientists should have some influence on the activities, regardless of whether they come from a large or a small country.

(c) the important scientific interests or agencies conducting arctic science from non-arctic countries should be served by any new scientific organization, benefit from its activities, and have an influence on its direction.

(d) the scientific aspects of any new organization or structure should have direct or close links to established interdisciplinary international scientific organizations, to ensure that science in the arctic is linked professionally to world science.

(e) the new developments must be able to respond to the special needs of arctic science, including:-

- the knowledge needs and value systems of northern residents and native people, which may differ from the priorities and average values of their respective countries as a whole;

- the different national systems in different arctic countries who share similar environments and scientific problems;

- the responsibilities, shared among circumpolar countries, for knowledge related to protection of the environment and the future well-being of arctic lands and ocean areas which at present have no or very few human inhabitants or human use, but which are of great present and future value to the world as a whole.

3.2 The international needs for improved co-ordination and communication in arctic science should be met by simultaneous international action in two complementary areas. It is proposed that:

I. A non-governmental scientific committee, provisionally called the International Arctic Science Committee, should be established to promote international co-operation in scientific research in arctic areas. The committee would serve the scientific interests of arctic countries and provide a forum for discussion and co-ordination of the research interests of any country involved in arctic science. It would have as its special responsibilities the facilitation of circumpolar studies and the linkage of arctic research to major advances in world science.

II. Representatives of governments of arctic nations - countries with territories north of the boreal forest zone -, should discuss the feasibility of establishing a mechanism for regular, structured intergovernmental discussions and liaison on arctic science matters. The discussions would deal with matters of common interest, including the organization and administration of international arctic research programmes and the exchange of scientific results. Such discussions, comprising

what might be called an Intergovernmental Forum on Arctic Science Issues, would supplement but in no way interfere with the various bilateral science arrangements presently in existence between arctic countries.

4. Organizational Outline

4.1 The proposed International Arctic Science Committee would be structured along the lines of regional and topical committees of the International Council of Scientific Unions (ICSU), and if deemed valid and qualified, might eventually be accepted by ICSU as part of its organization. As with ICSU, any country that carries out serious scientific work related to the subject of the Committee would be elegible to participate. Its members would be national representatives serving in their personal and not official capacity, appointed by major polar research organizations or scientific academies or ministries engaged in arctic research from that country. The Committee would cover all fields of science and research, including the social and historical sciences, pertaining to the arctic regions or distinctive arctic phenomena. Its terms of reference would include promotion and international co-ordination of arctic research, giving particular attention to:

- the interdisciplinary and multi-disciplinary nature of arctic research;

- the need to incorporate different areas and needs for knowledge (e.g. of the arctic native peoples, or of the smaller arctic countries) into the setting of priorities and review of opportunities for arctic research;

- the needs to relate arctic research and findings to world research programs and knowledge bases;

- the need to organize and improve the exchange and accessibility of scientific information about the arctic, especially between disciplines.

It is proposed that the International Arctic Science Committee operate through the following internal structure:

a) Board: Five to seven persons, of whom more than half should be representatives of nations with territory north of the boreal forests, and elected by and from the Council. The Board would be responsible for the operations and day-to-day affairs of the Committee. One member of the Board would be elected Chairman or President of the Committee, for a fixed term.

b) Council: A body comprising one national representative of each country adhering to the Committee by virtue of active involvement in research in arctic regions, plus the chairmen of the working groups. The Council would be the main operating and decision-making body of the Committee, responsible for its programme, policies, formation of Working Groups, etc. It may be necessary to define the amount or continuity of involvement in arctic research required for a country to "qualify" for membership on the Council (several ICSU bodies have this problem, and deal with it satisfactorily).

c) Working Groups: small groups of leading researchers or specialists in specific technical or subject areas which have been identified by the Council as subjects important to scientific progress in the arctic, and on which international study or review is particularly needed. The working groups would be the main forum for scientific discussions in an identified

.../19

subject field. They would review the progress of research and the exchange of scientific information, and consider priorities for future study. Members of working groups should be nominated by national bodies within each country to represent the scientific interests within that subject area on the basis of their personal expertise, and except for the chairman, need not be from countries represented on the Committee. The Working Groups will be approved or recognized by the Council and have clearly defined tasks and terms of reference. A Working Group would normally be a standing group of indefinite duration.

At times there may be a need for ad hoc or specialist groups to deal with particular topics or projects.

d) Secretariat: A standing small Secretariat, headed by a professional executive director or secretary, should look after the administrative and central communication affairs of the Committee. In Committee matters, the Secretariat would be responsible to the Chairman of the Board; but it is hoped and expected that the Secretary and Secretariat, with adequate office support, can be provided to the Committee by an arctic country, and thus in professional and administrative matters the Secretary and his/her staff would be in the employ of one of the member governments.

All activities of the Committee, including those of the Council, Board, and Working Groups, would be financed by the countries sponsoring the members participating. Arrangements would be made to rotate and select the location and timing of meetings to minimize the financial burdens

that activities of the Committee may impose on any country, and particularly on the smaller arctic countries. It can be expected that the Working Groups may wish to engage in special studies or other activities that will involve substantial expenses; the Council will examine each proposal and ensure that funding is available before approval for the activity is granted.

4.2 Representatives of arctic countries, in considering the feasibility of an Intergovernmental Forum on Arctic Science Issues, might take into account the need for a structure and suitable representation to address the following:

- the special needs of the arctic countries with respect to science management and international co-operation;

- the problems posed by the need for co-operation in studies of the arctic ocean and the arctic atmosphere which cannot be studied effectively within national territories;

- the need for intergovernmental co-operation in achieving compatibility and exchange of arctic data;

- the need for international contact or liaison in connection with national arctic science-related policies having to do with environmental protection and monitoring; resource development and exploitation; rights, responsibilities and involvement of indigenous arctic people, etc.

The degree of formality, intergovernmental status, and internal or international structure of the proposed Intergovernmental Forum on Arctic Science Issues would be determined by the governmental authorities concerned. It is important, however, that the Forum meet

regularly, that it is open to and if possible involves all circumpolar arctic countries, and that it reports at a sufficiently senior level in each government to be able to contribute to intergovernmental discussion on major arctic policy topics. It could be that the Forum would be most useful as a vehicle for discussion of "arctic issues" generally, and not confined to "arctic science issues"; however, in the present proposal we draw attention to the particular need with relation to science.

4.3 There does not appear to be need for organic or administrative connection between the International Arctic Science Committee and the Intergovernmental Forum on Arctic Science Issues. The activities and reports of the International Arctic Science Committee would be in the public domain and eventually, it is to be hoped, available through ICSU channels. The Intergovernmental Forum on Arctic Issues could make its views on science priorities or needs for research known to the Committee. By remaining separate, but each dealing in its own way with related issues, the two bodies could together increase the co-ordination, relevance and effectiveness of arctic science.

4.4 The formation and terms of reference of the International Arctic Science Committee and the Intergovernmental Forum on Arctic Issues, respectively, should be designed and arranged to support and supplement, but not compete with or displace, the several international organizations concerned with arctic science that are presently active. These include formal intergovernmental agreements, international scientific organizations, and non-government organizations concerned with arctic research and information. To achieve optimum international co-operation and an arctic science program that is balanced and effective, it will be necessary for the proposed new organizations to develop mutually supportive working arrangements with the existing groups. Some suggested examples, for illustration only, of such arrangements are listed in Appendix I.

.../22

5. Next Steps

(i) Discussion of the concept of an International Arctic Science Committee, and its feasibility, by members of the planning group, with scientists and authorities in their respective countries. This discussion should include, where there is opportunity, discussion with other countries on an informal basis. Determination of the initial reaction and response of respective countries;

(ii) Informal discussion and consideration by Ministries of Foreign or External Affairs of circumpolar arctic countries, of the need for and feasibility of an "Intergovernmental Forum on Arctic Science Issues";

(iii) Exploration on a preliminary basis of the procedures for and likely responses to an eventual affiliation of the International Arctic Science Committee with ICSU;

(iv) An informal international planning meeting to discuss the proposals in the light of (i), (ii) and (iii) above. The meeting would be at the level of senior scientists and arctic science administrators. If the general reaction is favourable, the meeting should

(a) obtain indication of continuing interest from participating countries, and identification of liaison offices or contact persons,

(b) compile a preliminary list of topics of study and initial activities for the International Arctic Science Committee,

.../23

(c) take steps to establish contact with ICSU and international science-related bodies with an arctic focus, to ensure support in principle and begin development of working relationships,

(d) determine costs, and explore feasibility for funding; explore possibilities for location, composition, and support for a secretariat,

(e) identify an action group and responsibilities for further steps on an international basis.

(v) (If it is decided to go ahead) preparation of a detailed proposal for consideration of the national authorities and international bodies that will be concerned;

(vi) Obtain expressions of interest and/or support from at least four countries with arctic territory, and support for a Secretariat,

(vii) Depending on favourable response to all of the above, it would then be necessary to identify individuals from various arctic countries and countries with arctic research activities who could set the Committee into operation; choose an interim chairperson, establish liaison with the Intergovernmental Forum if it has been established, and organize the initial meeting of the International Arctic Science Committee.

17 November 1987

Appendix I - Some organizations presently concerned with international cooperation in arctic research and their possible relationship to a future International Arctic Science Committee.

APPENDIX 1

Some Examples of Established Structures or Bodies Concerned with International Communication and Co-ordination of Science, Research, Technology Development or Information Exchange in Arctic Regions

Existing Body or Co-operative Arrangement (1987)	Possible Relation with an International Arctic Science Committee	Possible Relation with an Intergovernmental Forum on Arctic Science Issues
Bilateral intergovernmental agreements: (i) Broad agreements that may apply to the arctic; (ii) Broad arctic science agreements (e.g. USSR/Canada) (iii) Subject-specific arctic science agreements (e.g. USA/USSR on arctic medical research; Denmark/Canada on arctic marine environment)	Provide liaison in areas where research is involved	Keep distinctly separate but take into account
International arctic treaties with science implications (e.g. Polar Bear Treaty)	Review scientific implications and opportunities. Arrange for compatibility and exchange of data	Keep under review. Ensure policy support for required science
Intergovernmental science organizations (e.g. UNESCO MAB Northern Science Network)	Liaison and co-operation	Policy review and support
Informal intergovernmental arctic science organizations (e.g. Arctic Ocean Sciences Board)	Liaison; could become affiliated, or be a "Working Group"	Policy review and support; policy relations with non-arctic activities
Non-governmental international scientific bodies with national representatives (e.g. International Commission on Polar Meteorology; International Permafrost Association)	Liaison; involvement with Working Groups where appropriate	
International arctic oriented Non-Government Organizations (e.g. Comité Arctique International)	Liaison; direct co-operation or collaboration on selected issues; could function as a "Working Group" on occasion	Take into account; could provide valuable extension of policy, consideration or discussion
Circumpolar special interest groups that include science or research activities (e.g. Inuit Circumpolar Conference)	Liaison; could become appropriate for direct support, or become a subject for a "Working Group"	Take into account. Co-operate where appropriate; could be valuable for policy review

DEN NORSKE NASJONALKOMITÉ FOR POLARFORSKNING
(Norwegian National Committee on Polar Research)
Rolfstangveien 12
Postboks 158, N-1330 OSLO LUFTHAVN
Telefon: (02) 12 36 50

Oslo, 25 November 1987

Vår/our ref.: 2226/87/OR/MW/066-ASC

Deres/your ref.:

INTERNATIONAL CO-OPERATION IN ARCTIC SCIENCE

You will recall that at the informal Consultative Meeting on the feasibility of forming an international Arctic Science Committee, held at the Norsk Polarinstitutt on 13 February 1987, there was general agreement from the representatives of all arctic nations that there was a need for some kind of international arctic science organization in addition to the several international arrangements that already exist to deal with particular arctic scientific subjects. At that time, and at a previous informal meeting in San Diego, USA, we had discussed various problems surrounding the creation of an effective international arctic organization, and reviewed the history of many attempts that had been made in the past to achieve continued circumpolar international co-operation of scientific activities in arctic regions.

At our Oslo meeting, we agreed that the present time may be favourable for re-consideration of the feasibility of forming an international organization to help co-operation between different countries in all fields of arctic research and data gathering. Scientific knowledge from arctic regions is becoming of much greater importance not only to the northern regions themselves but to all northern countries and to world science as a whole; and new technologies for research in the arctic - using satellites, for example - have greatly expanded the base upon which scientific research in the arctic is being planned and carried out. These changes have increased the need for co-ordination between arctic science programmes, and increased the advantages to all countries if there can be an effective, continuing mechanism for international co-operation and communication in these fields. At the same time we recognized the need to be practical and realistic, and to take into account political issues and administrative problems that relate to international activities in arctic regions. We agreed that if any new organization were to be created, it should build on a structure that will give assurance of continuity and benefit to all the countries, large and small, that will be involved, as well as of benefit to science. Achievement of these benefits would require eventual connections with permanent international scientific organizations, and also a mechanism for regular intergovernmental communication between arctic nations on science-related matters.

The meeting appointed a Working Group consisting of O. Rogne, E.F. Roots and J. Taagholt to elaborate on the ideas discussed and to prepare a proposal for action that could be a working document for discussion or possible decision at the next meeting. After further meetings, and discussions of elements of preliminary drafts with senior persons in several arctic countries, the Working Group submits the attached report for your consideration.

While the attached report was in preparation, several events have occurred that increase the importance of giving careful consideration to the need for establishing an effective continuing international mechanism for co-ordination and communication on arctic science matters. In the United States, a five-year national plan for arctic research was presented to the President and made public, and it calls for increased international co-operation in arctic science. In Canada, a report on "Canada and Polar Science" requested by the Minister responsible for northern development stresses the importance of international scientific co-operation in polar regions. In Sweden, a new national plan for polar research support, with strong international components, received formal approval. The budgets for arctic research have been substantially increased in the United States and the Federal Republic of Germany; and the programmes under consideration in those countries as well as in the United Kingdom, France and Japan where there has been a revival of polar research interest, have a strong international dimension. There has been substantial progress in international multi-disciplinary selection of priorities for arctic research for the International Geosphere-Biosphere Programme of the International Council of Scientific Unions. On a larger perspective, the report of the United Nations World Commission on Environment and Development, chaired by the Prime Minister of Norway, draws attention to the urgent need for international co-operation in the study of environmental change and natural resources in less-known parts of the planet. And on October 1, 1987, the General Secretary of the USSR Central Committee declared strong support for international co-operation in the scientific study of arctic regions. All these developments make favourable the opportunity for creating an improved means for international co-operation in arctic science. But they also indicate that any new organizations or arrangements must be beneficial not only to science, but to the policies and different interests of each northern country.

On behalf of the Working Group, and as the person who was pleased to host the 1987 Consultative Meeting in Oslo, I hope that you will find the attached report to be of interest. We hope that it will be discussed widely, and that it will help in the development of interest and thoughtful comments, both in the scientific community and among those responsible for international affairs, in all countries concerned with arctic research. It is our earnest wish that each country will be able to bring to the next meeting a national position reflecting both its scientific and policy views, and a determination to take what action is required if it is agreed that an organization to enhance international co-operation in arctic science is needed and feasible. I draw your attention to section (iv) of Part 5, pages 22-23, of the report.

The next international meeting on this subject is being planned for early 1988. It is expected that invitations will be issued soon by the host organization. In the meantime, I or other members of the Working Group would be pleased to receive any comments or questions.

Yours sincerely,

Odd Rogne

Encl.

LIST OF PARTICIPANTS

Name and address	Information/remarks
Canada	
Dr. E. Fred Roots Science Advisor Ministry of the Environment OTTAWA, ONTARIO K1A OH3 CANADA	The polar man in central Canadian administration. Chairman of the Canadian committee to investigate the need for a Canadian polar institute.
Denmark/Greenland	
Director Gregers E. Andersen The Commission for Scientific Research in Greenland Øster Voldgade 10 DK-1350 KØBENHAVN K DANMARK	These two gentlemen should be the best spokesmen for Denmark/Greenland and with a close contact to the political administration
Dr. Jørgen Taagholt Scientific Liason Officer for Greenland (Same address)	
Finland	
Dr. Tuomo Kärnä Technical Research Centre of Finland Laboratory of Structural Engineering Betonimiehenkuja 3 SF-02150 ESPOO FINLAND	Dr. Kärnä is head of the Arctic technology group in this laboratory
Norway	
Director Odd Rogne Norsk Polarinstitutt	Chairman of the Norwegian National Committee on Polar Research
Dr. Jan A. Holtet Deputy director and Head of research Norsk Polarinstitutt	Secretary
Sweden	
Director Anders Karlqvist Swedish Polar Research Secretariate The Royal Swedish Academy of Sciences Box 5005 S-10405 STOCKHOLM SWEDEN	
Dr. Göran Rudbeck Research Secretary (same address)	Secretary of the Swedish Polar Research board

Name and address	Information/remarks
USA	
Dr. James H. Zumberge Chairman U.S. Arctic Research Commission 3500 S. Figueroa, Suite 114 LOS ANGELES, CA. 90007 USA	Dr. Zumberge is also President of the University of California and past President of SCAR.
Dr. W.T. Husken Executive Director (Same address)	
USSR	
~~Dr. Valentin V. Korpusov~~ Scientific advisor USSR Embassy Drammensveien 74 0271 OSLO 2	Copy for information to: Director N.N. Borisov USSR State Committee for Science and Technology 11 Gorky St. MOSKOW USSR

I have also added a few information/remarks to some of the participants for general information. It would help getting to know each other if we at the start of the meeting could supplement (or correct) these remarks.

Dr. Vilhjalmur Ludviksson
Director
The National Research Council
Laugvegi 13
101 Reykjavik
Iceland

Dr. Jerry Brown
Head
Arctic Research and Policy Staff
Division of Polar Programs
National Science Foundation
1800 G Street N.W.
Washington DC 20550
USA