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IASC as legal framework of international scientific cooperation in the Arctic

ABSTRACT: In contrast to Antarctica, the Arctic was for a long time deprived of an adequate system of multilateral international scientific cooperation. That gap was filled in 1990 by the foundation of a non-governmental International Arctic Science Committee (IASC). In this article, the origin, structure, operation and perspectives of that Committee are presented.

Key words: Arctic, scientific cooperation, law and politics.

Introduction

In the days of worldwide revolution in science and technology, scientific cooperation became an important factor of foreign policy in most countries and of international relations both at governmental and non-governmental levels. Polar regions, which are both objects and places of scientific research, are no exception in this respect. It must be remembered, however, that the Arctic and Antarctic represent two regions of striking similarities and contrasts not only of physical, but also political and legal nature. These resemblances and differences are strongly affecting the forms and substance of scientific cooperation in the two opposite polar regions. Thus, it must be considered comparatively within the broader context of international relations and international law.

All activities, including the scientific, are taking place in the polar regions under two opposite political and legal regimes. In the Arctic, under the impact of the polar sector theory, guided by the principle of exclusive sovereignty of states. In Antarctica, under the rule of the Antarctic Treaty system, based upon the concept of international common spaces, putting that region beyond national jurisdiction. These specific political and legal conditions determine the character of rules and laws governing international scientific cooperation in

each of the polar regions. In result, their origin, forms and contents differ substantially in the Arctic and Antarctic.

In Antarctica, which was liberated from political and territorial disputes by the 1959 Antarctic Treaty, favourable conditions have arisen for the relatively early development of an institutionalized framework for multilateral international scientific cooperation.¹ Contrary in the Arctic, which was transformed into the forefront of the East-West Cold War, dividing it by a political and military "ice curtain", the conditions for the emergence of such system of cooperation became extremely unfavourable. In result, for many decades international cooperation in the Northern Polar region relied mainly on casual bilateral arrangements, limited in form and scope.

The sudden collapse of communism in 1989, the official end of the Cold War and the elimination of most of the East-West controversies, have radically changed the picture on the arctic stage and paved the way for the development there of international, scientific cooperation on a solid multilateral and institutionalized basis. The experience of ICSU and SCAR in Antarctica, turned out to be a most useful example for the setting up of a coherent and comprehensive system of multilateral and multidisciplinary cooperation in arctic science.

After few years of negotiations these efforts have succeeded in the signing on 28. VIII. 1990 of the *Founding Articles for an International Arctic Science Committee*².

All states situated around the Arctic Ocean have a lot in common and are interdependent. They fight the same environmental battle, they are faced with identical local problems of economical and social character. This situation enforces a basic need for a harmonious circumpolar cooperation demanding multilateral international action with the participation of indigenous peoples and a comprehensive multilateral and multidisciplinary approach to the regional problems which include arctic science and research. That puts IASC in the focus of vital common interest of both Arctic and non-Arctic countries.

The Arctic as object and place of scientific research

In a special introduction opening the document, the authors of the IASC Founding Articles have concisely presented "The Arctic", which is both an

¹ In 1958 the International Council of Scientific Unions (ICSU) founded a Special Committee on Antarctic Research, transformed in 1961 into the present Scientific Committee on Antarctic Research (SCAR) which is a standing body of the Council and the main platform of international scientific cooperation in the Southern Polar Region.

² Hereinafter called: IASC Founding Articles. 1990 Founding Articles for an International Arctic Science Committee, IASC, Final Edition, August 1990.

object and place of scientific research and international cooperation. Referring to "a growing national and international interest in the Arctic", they emphasized its "scientific and political importance" and "economical potential", as well as "environmental sensitivity". The scope and contents of international scientific cooperation in the Arctic depend much on various extra-scientific factors, such as: political, strategic, economic, social, environmental, legal and others. Thus, let us see, how these factors interact and influence the activities of IASC, and contribute to the change of the overall picture of the Arctic.

Scientific importance. According to the IASC Founding Articles "there is an increasing need for scientific knowledge of the Arctic region. This is required for the wise development and management of that region and to ensure that Arctic research contributes fully to world science for the benefit of all mankind. This need comprises many fields of science, and is often of multidisciplinary or interdisciplinary nature". Let us see, how does this introductory declaration fit to the Arctic realities and what is the status of our knowledge of the Arctic now?

The Arctic forms a huge natural laboratory offering a surprising diversity of research possibilities in every branch of science. The majority of ongoing Arctic science has past the descriptive phase and taken the form of process studies. Some of them were earlier delayed in result of the militarization and fragmentation of arctic science, as well as the absence of institutionalized international scientific cooperation, comparative to that existing in Antarctica, which is treated as a uniform object and place of research and studies. Because recently scientific satellites have greatly improved the large-scale monitoring of physical and biological parameters in the Arctic, greater improvements in scientific investigation there can be expected in the future, especially under the auspices of IASC.

The tasks before that Committee are tremendous and require among other organization of research in areas that link the Arctic to the mid-latitudes, and in the large-scale connections and processes of the entire globe and even the solar system. This interdisciplinary and transborder research includes the investigation in the lithosphere, the atmosphere and oceans, comprising in the physical sciences such highly interesting phenomena as the aurora, weather and climate variability, pollution levels, plate tectonics, and continental drift. In the biological sciences, links between the Arctic and the rest of the globe, including the seasonal migration of animals and their longer term special adaptation to the polar environment. Finally, important social science research linking the Arctic with the lower latitudes includes studies of the native peoples culture, living conditions and their links with the outside world. Obviously, this exemplification of research topics is far from being exhaustive.

Arctic science requires adequate organization and support at national, regional and international levels.

Many countries have long ago recognized the importance of arctic science in their national objectives and some of them have taken vigorous steps to put appropriate policies into effect.

Russia, controlling more than a half of the Arctic Ocean coastline was for a long time foremost among these nations. Its scientific effort in the Arctic and along its margins exceeded until some years ago the combined effort of all other countries bordering the Arctic Ocean.³

The United States national Arctic policy was embodied in a bill entitled "Arctic Research Policy Act of 1982", while the American science management in the Arctic is rather intricate.⁴

Canada's Arctic research is conducted by several ministries and universities from a network of permanent research stations and field camps. Canada has participated in many joint projects with the United States. Much of the research coordination and information exchange was performed first by the non-governmental Arctic Institute of North America and now is continued by the Canadian Polar Commission and the Association of Canadian Universities and Northern Studies (ACUNS).

Another nation very actively involved in Arctic science is *Norway* with its leading Polar Institute in Oslo and national research centres on Svalbard (Spitsbergen) and Jan Mayen.

Denmark, (Greenland), *Iceland*, *Sweden* and *Finland* situated partly in the Arctic are also contributing significantly to polar science. *The United Kingdom*, *Japan*, *the Federal Republic of Germany*, *France*, *the Netherlands*, *Poland* and other countries, although not directly bordering the Arctic Ocean, have active arctic scientific programs, including maintenance there of research stations, sending scientific expeditions, participation in joint projects etc.

The arctic rim countries have many common interests in that region, but their bureaucrats and politicians though agreeing with the scientists about the importance of arctic science, disagree about the need for and shape of a policy — directed arctic research at national, regional and international levels. These

³ 1978, National Foreign Assessment Center, Central Intelligence Agency, Polar Regions Atlas, Washington D.C., pp. 30–31. The primary responsibility for Russian Arctic research lies with the Arctic and Antarctic Research Institute in St. Petersburg, which operates more than a hundred scientific polar stations, about a dozen oceanographic ships, several aircraft specially equipped to collect weather, ocean and sea-ice data, as well as two year-round floating stations on ice floes. In addition hundreds of other Russian scientific institutions, such as the Scientific Research Institute of Arctic Geology, the Permafrost Institute in Yakutsk, the Polar Research Institute of Marine Fisheries and Oceanography in Murmansk and the Hydrographic Enterprise of the Merchant Fleet that operates more than 30 Arctic ships and ice-breakers including nuclear-powered units, work exclusively or partially in the Arctic.

⁴ 1984, United States Arctic Interests. The 1980s and 1990s, William E. Westermeyer and Kurt M. Shusterich (eds.), New York. Before, with the exception of IGY, most of the American research in the Arctic was carried out, supported and managed by the Department of Defense. In the early 1960s federal civilian agencies began to expand their Arctic research activities, among them the National Science Foundation (NSF) was one of the first. Most of the projects were set up by NSF at universities and panels set up through the National Academy of Sciences, such as the Interagency Research Cooperation Committee (IARCC). Special interest in arctic science is shown by the State of Alaska.

disagreements came out into the open in the process of drafting the IASC Founding Articles.

Although international cooperation in the scientific pursuit of common problems was long before now recognized as an excellent idea, in the Arctic it was one that was difficult to achieve. One important aspect of the research programs in the Arctic was for a long time noticeably absent, namely the institutionalized, permanent, multilateral, interdisciplinary international cooperation. Several unsuccessful attempts to establish such a system of cooperation were made over the years, especially following the International Geophysical Year (IGY). This contrasted sharply with the Antarctic, where a well-defined and implemented international scientific cooperation has developed early and successfully.

While there has been a close bilateral scientific cooperation between Americans and Danes in Greenland, Americans and Canadians in the Arctic Ocean and Alaska, between Norwegians and many other nations on Svalbard (Spitsbergen), cooperative efforts with the Soviet Union have been few for political and strategic reasons. Only individual scientists have been able to make closer contact with Soviet researchers and to visit few places in the hermetically closed to foreigners Russian Arctic. In the atmosphere of mistrust and suspicion, the institutionalization of multilateral scientific cooperation in the Arctic encountered insurmountable obstacles. The breakthrough came in the late 80s in result of deep political changes in international relations affecting the Arctic as well. The establishment of IASC opened new wide opportunities to international cooperation in arctic science.⁵ Evidence of successful bilateral arrangements on scientific cooperation in the Arctic may indicate that a more multilateral approach to the region as a whole would be possible. A history of limited joint scientific research in the Arctic already exists and may increase along more formal lines after the setting into motion of IASC and the development of an international arctic science network is successful.⁶

Economical potential. In the Arctic, exploration and research went always together hand in hand. Until World War II, the Arctic was a remote and isolated area of interest only to a handful of explorers, fur traders, missionaries, scientists and to a sparse indigenous population. The war brought that region into the focus of world economy, as a key link in the shipping and air routes

⁵ An example is the possible cooperation in satellite-based studies of large-scale features of the Arctic. The European Space Agency and Japan plan to launch synthetic aperture radar (SAR) satellites that allow the study of geology, oceanography, and sea ice of the Arctic. The United States may launch similar satellites in the future. By establishing as few as three satellite read-out stations (one in Kiruna, Sweden; one in Churchill, Canada; and one in Fairbanks, Alaska), an Arctic-wide satellite coverage is possible. By carefully timing the launch of these satellites and sharing the information generated, far more sophisticated Arctic-wide scientific experiments become possible than through individual national efforts. 1984, U.S. Arctic Interests *op. cit.* (note 4) p. 176.

⁶ 1983. Northern Science Network Newsletter, UNESCO — MAB Northern Science Network Secretariat, Edmonton; vol. 1, no. 1, April 1983.

between the three northern continents and as an important source of living and mineral resources, as well as energy. After the war the region became also an important site for military installations, stations and strategic airbases. Moreover, field exploration has revealed that the far North contains vast reserves of various mineral deposits and hydroelectric power. But, the geology of the Arctic is complex and the region has only recently begun to receive the level of comprehensive and detailed studies necessary to unravel its origin and history⁷.

The mineral potential of the Arctic is vast, but the developmental and exploitation problems are likewise great, but not insurmountable. The role of research and sciences, especially geological, is crucial for further development of mining industry in the Arctic.

When considering the exploitation of living resources of the Arctic it is necessary to distinct the terrestrial and marine ecosystems. Their exploitation and uses evident in the archeological records has an extent history. It refers to the exploitation of marine mammals (whales, walrus, seals, polar bears), terrestrial mammals (caribou, moose, sheep, bears, wolves), birds and fishes. Only few of the variety of arctic living resources are commercially exploited, in the sense of large-scale, organized hunting, harvesting and marketing. In some regions of the far North they are reserved to indigenous population. Habitat destruction and alteration might turn out detrimental to all arctic living resources that it supports. International studies of these effects seem necessary to prevent the destruction of the arctic living resources.

The potential exists for a major expansion of resource development activity in the Arctic. But the existence of many resources in abundance in the Arctic is of little value if the means by which to transport them economically to market does not exist. In polar harsh conditions providing transportation is a very complex undertaking, requiring construction of pipelines, icebreaking tankers or submarines, ports, airfields etc. Transportation system planning and design requires careful prior studies and research to answer many questions concerning technical feasibility, environmental impact assessment, social and cultural consequences etc.

The search for and discovery of the main arctic sea routes: the Northwest Passage and the Northeast Passage, were the goals of exploratory voyages from the fifteenth to the twentieth century, giving opportunities for scientific observations and investigations on vast stretches of the Arctic Ocean. The Northern Sea Route, a 6297 kilometer-long maritime line along the Russian Arctic coast, is essential to economic development of it. No less important for Alaska, Canada and Greenland is the shorter Northwest Passage.

⁷ The Arctic contains several polymetallic (copper, zinc, lead, gold, silver) deposits that, along with the coal, are large enough to have significance on a worldwide scale. Scattered occurrences of chromium, cobalt, tin, tungsten, and other critical and strategic minerals, as well as phosphate beds, oil shale, sand and gravel have been reported in various parts of the Arctic. The mineral resources of current and near term interest are oil and gas.

Over the Arctic pass the shortest air ways linking the three continents of the Northern Hemisphere. No wonder, that many commercial airlines availed themselves of this opportunity and opened numerous trans-Arctic flights.

The growth of interest in exploiting the resources of the Arctic has generated an array of more or less severe conflicts of economic, social, environmental, scientific and political character. In the days of Cold War, the faster the North was opening to new technologies and science, the more the arctic states feared challenge of their sovereignty, territorial integrity and economic interest in the region. That resulted often in moves on their part aimed at the closing of their polar areas to the access by foreign subjects, including the scientists and research expeditions. And that made difficult the conduct of circumpolar research and transborder scientific cooperation. Now the Arctic is entering a period of greatly accelerated economic, social, strategic, and political change. One of the driving forces behind that change is resource development activity. But the knowledge of the Arctic and experience in that polar region are still limited. And at this juncture the role of scientific investigation is considerably growing. At the same time, competing interests and differing values exist in the Arctic among national groups of native population, among the arctic countries and between them and non-Arctic states, affecting strongly the international cooperation in arctic science.

The Arctic is today a frontier area and parts of it are likely to experience a major economic expansion in the next future. This possibility makes a thorough evaluation of the position and interest of science and research a necessity. The relatively undeveloped state of the Arctic presents the scientists of all branches of science with an opportunity to formulate their goals in advance of the expected deep changes. The role of the newly founded IASC in this task can not be underestimated.

Environmental sensitivity. According to IASC Founding Articles "the Arctic region is environmentally sensitive. The Arctic has a major influence on global systems of climate, weather, ocean circulation and other important environmental issues. It may respond more readily than other regions to global changes; processes that occur mainly in the Arctic region can induce significant effects over the entire globe". That introductory declaration raises a number of fundamental issues related to arctic science and consequently laying down a line of conduct for IASC. The principal lesson flowing from that statement is that a considerable part of Arctic research, especially that specified in the above statement, must be conducted within the global context and with respect for environmental requirements.

The scientists consider Arctic ecosystems highly vulnerable and extraordinarily sensitive to external intervention. Recently, however, in the industrial circles, a view is given publicity which holds that the Arctic environment is less fragile than commonly perceived. According to them, over wide areas and longer time frames, "Arctic ecosystems probably have quite strong survival

powers”⁸ Most scientists do not share, however, that optimistic view and consider that there are a number of serious environmental concerns in the Arctic. Also environmental groups with political clout to voice these concerns indicate, that we simply do not know enough yet about arctic environmental processes to predict precisely the effects of all man’s activities in the Northern Polar region.

The main question arising is: what is in the Arctic to protect? Undoubtedly in the first instance it is the arctic tundra with its unique fauna and flora, as well as the living resources of the Arctic Ocean and its coastal areas. Living communities in the arctic tundra, coast and sea are very complex. The climatic extremes of the far North have engendered a unique biota of great value both to the human inhabitants of the Arctic and those who live at lower latitudes.

Because of environmental extremes, incoming solar radiation, great variation in length of day and harsh climate, arctic ecosystems and biomes are peculiarly vulnerable to physical and chemical disturbances. Arctic life forms also are inherently vulnerable to disturbance of any kind, especially human intervention, because they often are near tolerance limits for energy and nutrients and tend to reproduce very slowly.

One of the significant environmental concerns in the Arctic is the potential overharvest of its animal populations and other living resources. Fur-bearing mammals, marine mammals and migratory birds present the greatest potential for overexploitation. All human activities — including scientific — pose in the Arctic a wide spectrum of environmental risks.

Certain continuing actions, such as biological conservation or control of air and water pollution are key to environmental protection in the Arctic. Conservation and protection of the arctic environment is performed at three levels: international by virtue of universal treaties and conventions⁹, regional by means of local agreements and national through laws and orders. The Arctic is lacking a comprehensive and uniform environmental legal regime similar to that established in Antarctica by 1991 Madrid Protocol on Environmental Protection to the Antarctic Treaty.¹⁰ The circumpolar Arctic environment would undoubtedly benefit from a more energetic pursuit of multilateral conservation agreements at international and regional levels. The present state of national segmentation of the environmental protection results frequently in gaps, contributing often to further degradation of the arctic environment.

The Arctic constitutes a geographical, geophysical and natural unity, and its circumpolar environment cannot be effectively protected by any single nation.

⁸ 1978. National Foreign Assessment Center, *op. cit.* (note 3), p. 4.

⁹ A good example serves the Convention on Long-Range Transboundary Air Pollution which went into effect on 16.III.1983, three months after being ratified by 24 nations, including such Arctic states like the United States, Soviet Union, Canada, Denmark and Norway.

¹⁰ Machowski J. 1992. The Antarctic environmental legal regime. *In:* Polish Polar Research; 13 (3–4) 183–214

Most of the problems arising, like air, sea and ice pollution, are international by definition, while all of them depend on common research and scientific investigation, opening before IASC new opportunities for action.

Demographic and social problems. In contrast to uninhabited Antarctica, the Arctic is home to unique native peoples.¹¹ All of them possess a distinctive culture being the product of centuries long adaptation to the harsh living conditions in the polar environment. They all share a concern that their economy and culture could be affected and radically altered by the physical and social effects of economic transition of the region. Thus, the indigenous population in the Arctic demands special attention by social scientists. The Arctic has received notable attention not only from the natural science community, but also social scientists, including those cooperating with IASC.

No other group of population has been as affected as the native population by development activities in the Arctic. Although, in result of native land claim settlements reached in Canada and Alaska, they formally control today several million acres land throughout Arctic, the list of problems waiting solution remained long. Even more complex are the socio-economic native interests in Russia and Scandinavia. The native leaders worry about that will happen to their traditional values and lifestyles. They fear that the major sources of money will one day depart, leaving behind a wide range of sociocultural problems, including alcoholism, drug habits and suicide.

It seems, that the Inuit (Eskimo), living in four different states, are in the best position to begin international and regional circumpolar efforts to further Arctic rim cooperation in such fields like environmental protection, preservation of traditional northern life-style and culture, protection of all fish and wildlife resources and habitat on the basis of total ecosystems use etc.¹² These efforts require not only special interdisciplinary and multidisciplinary research, including history, archeology etc., but also strong support of the arctic science, in particular the social sciences. The role of social sciences in curbing the

¹¹ The chief Arctic native population groups are: the Eskimos calling themselves Inuit ("The people") and living in Greenland, Canada, Alaska, and Siberia, the Lapps (Saamian) of Scandinavia and the major Eurasian Arctic groups, very small and numbering 19 and going by various alternative names, like: the Samoyeds of western Russian Arctic, the Yakuts, Tungus (Evens), Yukaghirs, and Chukchis of the eastern Russian Arctic. 1991. *The New Encyclopedia Britannica*, vol. 14.

¹² Among the native Arctic people the trend toward regional cooperation is stronger than among any other people living within that region. In 1973 the Arctic Peoples Conference was held in Copenhagen. In June 1977 the first Inuit Circumpolar Conference (ICC) was held at Barrow, Alaska with the participation of Alaskan, Canadian and Greenlandic Eskimo regional associations. ICC was admitted as a Non-Governmental Organization (NGO) member of the United Nations and is acting as "the indigenous guardian of the Arctic." At the ICC it was agreed among other that a single, international coastal zone management was required for the entire North American Arctic coast. See Inuit Circumpolar Conference Charter, 1980, Nuuk, Greenland, ICC Document 1, also. The President's Report, Inuit Circumpolar Conference, July 25-31, 1983.

negative impacts of arctic development might be important, by means of explaining the nature of changes and pointing to remedies. The cooperation between IASC and the native arctic peoples organizations which is in the process of establishment is in this respect essential.

Political, strategic and legal aspects. IASC is operating in the Arctic in a political and legal environment far more complex than that of SCAR in Antarctica. The definition of the status of the Arctic under international law and determination there of national sovereignty and jurisdiction is an extremely difficult task, due to historic past, political realities and legal ambiguity. Unlike Antarctica, the Arctic does not have a general treaty dealing with the region as a whole. In the Arctic, the legal rules defining its status are scattered throughout the numerous bilateral and multilateral instruments, dealing either with parts of the region or with its selected aspects. They are often ambiguous or even contradictory, leaving room for doubts and gaps, opening the door to disputes, unfounded claims and controversial interpretations.¹³ In that jungle of laws, at least two international instruments and one legal theory may offer some guidance in the search for political, legal and scientific solutions. They are: the Spitsbergen Treaty of 1920, the United Nations Law of the Sea Convention of 1982 (hereinafter called: LOS) and the polar sector theory. The Spitsbergen Treaty offers, however, an international legal framework only for a limited geographic area of the Arctic, north of Norway around the Svalbard Archipelago and the Bear Island.¹⁴

Since most of the Arctic is covered by the ocean, the LOS rules play there an important role in the relations among the Arctic and non-Arctic nations at international, regional and national levels, regulating not only the navigation,

¹³ For instance, in the Beaufort Sea, Canada and the United States, dispute the location of their marine boundary; in the Bering Sea another boundary problem exists between the United States and Russia; the nature of transit rights through the waters of the Canadian archipelago (the Northwest Passage) is also disputed. A potential sovereignty dispute also exists with Norway, which claims that the right of signatories of the Spitsbergen Treaty of 1920 to exploit the resources of the Svalbard Archipelago does not extend to the continental shelf of four miles zone.

¹⁴ Treaty Concerning Spitsbergen, 9. II. 1920 in 2 LNTS 8. Prior to the discovery of coal on the islands comprising the Svalbard Archipelago at the end of nineteenth century, little interest was expressed in their ownership. Until 1920 the islands were considered *res nullius*, or belonging to no one. Sovereignty over the islands was given to Norway at the Versaille Peace Conference ending the World War I. The Spitsbergen Treaty was signed on 9. II. 1920 by most major powers. Norway, as a neutral country, has formally accepted Svalbard (Spitsbergen) on 14. VIII. 1925, while Germany and Russia, both showing mining interest in the islands, were debarred from the Peace Conference. Although all signatories to the Treaty have the right to maintain permanent settlements on the islands, only Norway and Russia have done so. In 1944 Norway's sovereignty over the archipelago was questioned when the Soviet Government unsuccessfully sought a joint Norwegian-Soviet administration and total cession of Bear Island to the Soviet Union. The principles governing the Spitsbergen Treaty are well decribed in: 1978. Willy Ostreng, *Politics in High Latitudes: The Svalbard Archipelago* (translated by R.I. Christophersen), Montreal, Mc. Gill-Queen's University Press.

but also other activities, including science and research. Although the LOS may be accepted as the legal regime for marine boundaries in the Arctic, claims by nations in the region indicate that it does not promote uniform and clear definition of national and international rights in the Arctic Ocean. Several cases of political and legal uncertainty have arisen on the offshore extent of coastal state jurisdiction over the Arctic seabed and superjacent waters, on the delimitation of continental boundaries and the scope of coastal state rights to regulate navigation and other ocean activities beyond territorial waters. Nonetheless the importance of LOS is amplified by the fact that although five nations border the Arctic, there are only two international land boundaries that touch the coast of the Arctic Ocean (US-Canada and Russia-Norway). Even though neither of these land-based boundaries is in dispute, potential and actual controversy marks the effort to establish five marine boundaries in the Arctic.¹⁵

But, of particular importance for IASC activities are the stipulations contained in Part XIII of the 1982 LOS Convention dealing with Marine Scientific Research (Articles 238–265). These articles provide among other for global and regional co-operation in marine scientific research, conduct and promotion of that research, legal status of scientific research installations or equipment in the marine environment and finally are dealing with responsibility and liability, as well as settlement of disputes related to scientific activities.

Although the polar sector theory has not gained full international acceptance, its impact on the legal status of the Arctic and international relations therein is significant.¹⁶

¹⁵ There are several criteria for determining the national sovereignty and jurisdiction in the Arctic. Three boundary limits, as they pertain to national marine jurisdiction, are defined in the LOS Convention of 1982 and serve as legal frame of reference for boundary delimitation of: the continental shelf (Art. 76), the 12-mile territorial sea (Art. 3) and the 200-mile exclusive economic zone (Art. 57). In addition, the Convention contains special provisions for ice-covered waters (Art. 234), cooperation of states bordering on enclosed or semi-enclosed seas (Art. 123), high seas (Art. 87), navigation through international straits, pollution control, and freedom of marine scientific research — all of which have significant impact on scientific and research activities. See: Symonides J. 1988. *The New Law of the Sea*. Polish Institute of International Affairs, Warsaw. Legal, political and scientific issues are complicated by the presence of landfast ice, which frequently obscures the distinction between sea and land. Even more complex are such issues made sometimes by the presence of large masses of drift ice, raising the question of which Arctic waters should be legally considered as free high seas and which fall under national jurisdiction. Machowski J. 1992. The status of polar ice under international law. *In*: *Polish Polar Research*; 13 (2): 149–175.

¹⁶ Only two states base their territorial claims in the Arctic on the theory of polar sectors which is part of the doctrine of international law. It was proposed in 1907 by Pascal Poirier, a Canadian senator as the solution of the national status of polar regions. In the Arctic, the name of polar sector is given to an area comprised between two specified meridians from the base consisting of the coastline of the given state up to North Pole, so that all lands and islands situated within it form the territory of the state claiming the sector. Only Canada and Russia have in the Arctic accepted that theory, but taking into account that they jointly control much more than half of the region, it may be said that this method proved to be practical in that part of the world. Other Arctic rim states did not establish their polar sectors. The United States, Denmark and Norway proclaim consistently the

International scientific cooperation is less easily achieved when questions of jurisdiction or ownership arise or when threats to national security are perceived. In the light of increased activity in the Arctic, including research, dormant boundary disputes and conflicting opinions over the extent of jurisdiction in some areas are issues which deserve attention of IASC.

Even after the extinction of the Cold War, the importance of the Arctic as a *strategic arena* cannot be underestimated. The closure of vast polar areas for military reasons and ban of access for scientists is limiting seriously scientific research.

Prior to World War II there was no concern for the strategic position of the Arctic. This position shifted, however, during and after the war when the Arctic came into sharp focus for the military. During World War II the Arctic Ocean was transformed into a battle field with the German invasion of Denmark and Norway in 1940, and the imminent threats of Nazi occupation of Svalbard and Greenland.

After the war, United States and other Arctic nations defense interest shifted to the military threats of the Soviet Union, which controlled more than half of the coastline of the Arctic Ocean. In result, the Arctic was covered with a net of military installations, bases on land, Arctic islands and ice floes, the Distant Early Warning (DEW) radar sites, accompanied with extensive exploration for military purposes inland on the tundra covered arctic areas and the Arctic Ocean, while on drifting ice islands permanently manned stations were established. The armed forces of some arctic states, in particular Russia and the United States, established special polar research laboratories to investigate that region for military purposes. The objectives of their programmes and projects were diverse, concerned both with fundamental and applied sciences, contributing significantly to arctic science. Unfortunately a large proportion of that research remained classified for military purposes.

To support military operations in the Arctic, each of the armed forces there conducts adequate research and development (R & D) programmes of varying scale and intensity to meet their respective needs on land, sea, ice, in the air and outer space. The primary objective of military research programmes in the Arctic is twofold: to provide fundamental knowledge of this complex region and to be a source of new concepts and technological options for the maintenance of the military forces and their operations in this extremely difficult environment.

applicability in the Arctic of traditional rules of the law of the sea. The US refused to recognize any sector theory approaches, giving tacit approval to air and sea navigation and scientific activities in the region in accordance with the free seas principle. See: Breitfuss L. 1928. Die territoriale Sektoreneinteilung der Arktis in Zusammenhang mit den transarktischen Luftverkehr. In: Petermanns Geographische Mitteilungen, Gotha, R. 74, Issue 1/2: 27; Lakhtine W. 1930. Rights over the Arctic. In: American Journal of International Law, 24, (4); 703–712; Smith O.M. 1934. Le statut juridique des Terres Polaires, Paris.

The Arctic is of strategic importance now for a variety of reasons: first, it is the only region where the two nuclear superpowers, the United States and Russia, share a common border; second, the Arctic Ocean serves the rim nations as an important defensive barrier to attack from the north "over the top" of the world. In the years of intensified Cold War activities, the Arctic became a very important area of forward deployment.

The militarization of the Arctic had on the research and science both positive and negative impact. On the one hand, substantial financial means were appropriated for polar research, which involved large scientific staff and military logistic and other support. On the other, the secrecy accompanying military scientific research resulted in closing of vast areas and refusing the access to scientists, limited considerably their right to freedom of scientific research in that region. Moreover, military remained proprietary of most of the secret research results for long time, reducing the universal repository of arctic knowledge.

The strategic importance of the Arctic is not likely to decrease soon in spite of the political detente. Its unique geopolitical situation, the commitment and massive investment by the rim states toward developing the Arctic and its military capabilities seem to be too important to resign easily. The deep political changes in international politics at the turn of 1980s and 1990s, however, have already brought tangible signs of positive developments in the political atmosphere and the attitude of Russia and the NATO countries also in the Arctic. Looking into the next future, one might envision that there are good prospects for renewed efforts to transform the Arctic into a denuclearized or even demilitarized zone. Such development would undoubtedly bring the Arctic closer to the idea of a region devoted to peace and science, similar to Antarctica.

Political disputes, legal controversies, military conflicts, economic competition, social unrest and environmental threats seriously affect arctic science and imminently impair the polar research processes. Nevertheless, the Arctic is distinctive, and the political, strategic, economic, social, environmental and legal context within which the polar scientific issues must be resolved is without parallel in the policymakers experience. Although it is not yet clear enough how best to fashion international scientific cooperation in the Arctic, it is obvious that the growing potential for conflict among national interest of the Arctic rim countries and with non-Arctic states interests would constitute a threat for science and research.

A circumpolar regional approach in the Arctic could help provide agreements on such issues as navigational aids, data centers, shipping lanes and pollution control arrangements, essential in scientific cooperation. The 1982 LOS Convention even offers in Article 123c possible guidelines for such cooperation at governmental level, calling upon states "to co-ordinate their scientific research policies and undertake where appropriate joint programmes of scientific research in the area." The foundation of IASC constitutes an

important step towards intergovernmental multilateral cooperation in arctic science.¹⁷

From conception to birth of international arctic science

It was not until the last century that synoptic arctic observations — made simultaneously by many scientists at many points in many countries — became general. At a scientific congress in Berlin in 1828, the German scientist baron Alexander von Humboldt proposed a scheme of widespread observations and persuaded the Russians to establish a chain of magnetic observations across Russia and Siberia to Alaska. The inventions of radio, telephone and telegraph, enabling fast compilation of research data from distant and remote sites, laid down the technical foundations for international scientific cooperation in the Arctic. During the latter half of the nineteenth century, international arctic science advanced by leaps and bounds.

The pattern of modern arctic science was cast in two International Polar Years in 1882/83 and 1932/33. At the turn of centuries, polar research became gradually a matter of concern for national governments and international organizations rather, than individuals. Although ever greater numbers of individual researchers have participated in studies of the Arctic, much of arctic science has been conducted as big science rather than small, unconnected projects. The remoteness of the polar regions, the costs and difficulties of arranging logistics, and the scale of national phenomena to be studied, have dictated this approach, leading to closer international cooperation.

During the Second International Polar Year 1932/33, many governments, despite the constraints of the economic depression appropriated relatively large funds to their participation in this common endeavour, with most of the research scheduled in the Arctic.

This nucleus of international arctic science perished in the ruins of World War II. But despite of the earlier presented postwar political and military obstacles, an agreement was reached to organize in 1957/58 the International Geophysical Year (IGY), as the continuation of the tradition of International Polar Years. Before the IGY, most of the research carried out in the Arctic was supported and managed by the military. In the early 1960s, in result of the IGY

¹⁷ Only one decade ago Bloomfield noted that: "Arctic political cooperation will not be as easy as it was in 1959 in the Antarctic. Whereas rudimentary institutions could be created and legal issues bypassed in the Antarctic, the Arctic is already an arena of competition in the newly vital realm of resource availability, and potentially in the strategic realm as well. Moreover, the political climate today for multilateral institution-building is nowhere near as propitious as it was two decades ago." Bloomfield L.P. 1981. *The Arctic: Last Unmanaged Frontier*. In: *Foreign Affairs*, Fall 1981, pp. 103–104.

cooperation, it became clear that polar research for civilian purposes must be expanded in the interest of global changes in the atmosphere, seas, climate etc. But, international scientific cooperation, following the IGY, took different path in the Arctic and Antarctic.

Antarctica inherited after the IGY a well coordinated logistic system consisting of a net of scientific stations, field camps, communications, aircraft, ships and surface transport governed at international level by a regime established by the Antarctic Treaty System and SCAR. In contrast, in the Arctic, logistic support remained fragmented and insufficient, dispersed throughout the arctic rim countries and managed by differentiated national economic and legal systems. Nonetheless, the idea of internationally coordinated multidisciplinary observations of natural phenomena at numerous locations slowly gained support also in the Arctic during the following years, with the view to reach an understanding on large scale arctic research programmes.

But, the earlier mentioned political and strategic obstacles slowed down these efforts. Although informal discussions about the possibility of joint multilateral projects and institutionalization of international scientific cooperation in the Arctic occurred for years between individual scientists and explorers of various nations, official sanction or even formal discussions of such efforts were by governmental circles conspicuously avoided. That attitude has changed gradually in the late eighties, opening the door to internationalization of arctic science.

A major role exists for science and scientists in the Arctic. Some of them even contend that the keys to solving many national, and, indeed global problems are to be found in the Arctic. There have been, however, disagreements among both scientists and policymakers about the need for a formal science policy and broad international scientific cooperation in the Arctic. The major disagreements concerned the necessity or desirability of coordination and cooperation at regional and international levels, as well as the degree to which scientific investigation in the Arctic is unique and therefore requiring special consideration in the sphere of national policy and international relations. All agree, however, as to the importance of continued scientific research in the Arctic. But, acquiring a greater understanding of large-scale Arctic natural phenomena and processes is best accomplished in concert with all arctic rim countries. And at this juncture comes into the picture the need for an institutionalized international scientific cooperation.

The first attempts to form a permanent international body — comparable to SCAR — able to coordinate and promote arctic science, referred to the International Polar Commission created in 1879 in connection with the First International Polar Year. Serious discussions on this theme started at the 1957 ICSU Executive Meeting in Brussels, Belgium with the view to establish a SCAAR — a Scientific Committee on Arctic and Antarctic Research. It was soon realized, however, that there are real chances only for SCAR, shelving the idea of SCAAR to an unforeseen distant future.

With the first signs of the melting of the "ice curtain" it became clear that the time has come to materialize also in the Arctic the slogan saying that "science knows no borders". In June 1986, during the SCAR meeting in San Diego, U.S.A., informal talks on the possibility of establishing an international Arctic science organization took place. The general consensus at that meeting¹⁸ was reached, but it was found necessary for the purpose of future negotiations to define first the term "Arctic countries." It was finally agreed that the term would refer to those eight countries having territories north of the Arctic Circle, namely Canada, Denmark (Greenland), Finland, Iceland, Norway, Sweden, the United States and the U.S.S.R.

On 13 February 1987 for the first time senior people holding in Arctic countries key positions dealing with polar research, national science policy and international relations have met in Oslo, Norway to discuss cooperation in arctic science. In result of these talks a three member (Canada, Denmark, Norway) Working Group was appointed to draft proposals on the need, feasibility and possible structure of an arctic science organization.¹⁹ A meeting convened in March 1988 in Stockholm, Sweden to discuss the proposals worked out by the Working Group was attended by a wider group of people, including some government officials. After discussing the Working Group report, they "unanimously agreed that an International Arctic Science Committee should be established". Because a number of controversial questions on the organization of IASC needed further consultations, another Working Group was appointed to elucidate them.

The U.S.S.R. offered to host the next meeting of the Group, in conjunction with an arctic science conference scheduled in Leningrad. The new Working Group started its work shortly afterwards, and meetings were held in Moscow and Stockholm prior to the Leningrad meeting, which was held before the Conference of Arctic and Nordic Countries on Coordination of Research in the Arctic in December 1988. Although a majority of the Group was willing to found IASC based on the Leningrad text, the U.S. position was not fully supportive, and new discussions were initiated.²⁰

A modified version of the draft Founding Articles was produced in Helsinki, Finland in May 1989. However, since the key issue of representation was not fully resolved, representatives from Canada, the U.S. and the U.S.S.R. were

¹⁸ Representatives from France, the Federal Republic of Germany, Japan, Poland and the United Kingdom participated in that meeting along with those from the Arctic countries.

¹⁹ In result of these talks two preliminary documents were produced, namely: Roots E.F. and Rogne O. 1987. The need for, feasibility and possible role of an International Arctic Science Committee, Ottawa/Oslo, pp. 1-16 (mimeographed) and International Communication and Co-ordination in Arctic Science — A Proposal for Action — prepared at the request of an informal consultative meeting held in Oslo, Norway on 13. II. 1987 by a Working Group, 17. XI. 1987, pp. 1-23 (mimeographed).

²⁰ 1990. The International Arctic Science Committee. *In: Arctic Research of the United States, 1990 Fall*, pp. 65-70.

requested to further negotiate as needed. It was not until March 1990 that a new text was agreed upon and sent for national comments with a strong recommendation to accept it. Comments received were only editorial and were resolved through written communication. A Planning Group, responsible for the final text of the IASC Founding Articles was appointed of representatives from the Arctic countries under the chairmanship of Dr. Odd R. Rogne from Norway at the meeting in Stockholm in March 1988. The final text of the IASC Founding Articles was signed at Resolute Bay on 28.VII.1990 by representatives of national scientific organizations from the eight Arctic countries.²¹

The International Arctic Science Committee

In effect of the earlier presented preliminary studies, policy statements and discussions within the scientific community and among representatives of scientific organizations in countries concerned with arctic science and research, the proposal to establish the IASC took the formal shape of the Founding Articles. This legal instrument is formally a non-governmental agreement concluded between the national scientific organizations of the eight Arctic countries. That fact is deciding on its form, which in appearance takes the position somewhere between an international agreement and a statute of an organization. In case of IASC, the Founding Articles are supposed to play both roles, especially in the absence in the Arctic of a general intergovernmental instrument comparable to the Antarctic Treaty which is regulating relations in the Southern Polar region.

The geographical scope of IASC activities is the first issue to consider. In contrast to the Antarctic Treaty, the IASC Founding Articles do not define precisely the geographical boundaries of the Committee's activities, stating simply in the introduction that it "covers all fields of Arctic science". Scientists agree that the Arctic is a distinct region in the physical sense, but do not agree on its exact boundaries. There is even less agreement on whether the Arctic should be considered a region in the political sense. All these doubts are reflected in the formulation of the Rules and Procedures adopted at the IASC Council Meeting in April 1992, which provide in par. 1.2 that "the southern boundary to which Arctic refers, shall not be defined but shall be determined by context."

²¹ Following were the national scientific organizations signatories of IASC Founding Articles: for Canada — The Interdepartmental Committee on International Science and Technology Relations (replaced by the Canadian Polar Commission designated as Canada's National Science Organizations for IASC), for Denmark — the Commission for Scientific Research in Greenland, for Finland — the Academy of Finland, for Iceland: the Icelandic Council of Science, for Norway Norwegian Academy of Sciences and Letters, for Sweden — the Royal Swedish Academy of Sciences, for USA — the National Academy of Sciences and for USSR — the USSR Academy of Sciences, the Arctic Research Commission. Observers from France, Germany, Japan, Poland and UK, as countries engaged in Arctic research were invited to the signing ceremony.

The problem of parties to the Founding Articles and *membership* of the Committee, is one of far reaching consequences and political significance. Similarly to the Antarctic Treaty System, where such categories of parties were specified like claimant and non-claimant states, Consultative Parties and Non-Consultative Parties, developed and developing countries, with differentiated status, rights and obligations, the IASC Founding Articles have introduced a distinct differentiation between the Arctic countries and the non-Arctic countries. That division emerged at the earliest stage of negotiations on the Founding Articles, when the term "Arctic country" was defined. Looking back at the negotiation process and studying the text of the Founding Articles, an irrefutable conclusion is suggested that IASC was founded by and primarily for the Arctic countries, while the non-Arctic countries were given only an opportunity to adhere to the Committee later on under specified conditions. Interdependence among the Arctic states in polar research and science is a fact of life which must be taken into account in all the endeavours undertaken by IASC, in the assessment of its activities and in analysing the contents of its Founding Articles.

Thus, let us have a closer look at the differences in the status of the Arctic and non-Arctic countries under the Founding Articles and other IASC documents. The privileged position of the Arctic states was marked at the very outset in the Preamble, which has not only specified them by name, but is "recognizing the special interests of the countries of the Arctic Region." These "special interests" were further safeguarded by the General Principles (Article A.6), providing that "the activities of IASC should be consistent with the regional interests of the Arctic countries." Further, Article C. 2 (i) gives "the representatives of the scientific organizations of the eight Arctic countries" the exclusive and unreserved right of participation in the IASC Council. According to Art. C. 4 "the Council will carry out its functions on the basis of consensus, taking into account the regional interests of the Arctic countries. In matters of special regional interests, the eight Arctic countries may pursue cooperative scientific programs of projects directly, or using IASC as a forum." The referred provisions are leaving much room to controversies and disputes on interpretation, especially in the absence of an unambiguous definition of the notion of "special regional interest". The "founding fathers" of IASC have only touched upon that problem in their preliminary papers, without trying, however, to provide us with a clear definition of that notion, substituting it instead with an even more obscure term of "national or domestic arctic priorities".²²

²² In the relevant preliminary papers it was stated among other: "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 the specific arctic areas. The science connected with such responsibilities often must be undertaken to produce results quickly and to contribute to expedient decisions..."

The privileged position of the eight Arctic countries within the IASC structure was manifested perhaps in the strongest way through the establishment of the Regional Board, an exclusive body of the eight Arctic countries to "consider general regional problems and other questions which affect the common interests of the Arctic countries" with the purpose "to ensure that the activities of IASC are consistent with those interests" (Art. D. 1.). The location of the IASC Secretariat in one of the Arctic countries (Art. G. 4) is additionally serving that purpose. And finally, according to Art. I. 1 "the Founding Articles will take effect when endorsed by the representatives of national scientific organization of the eight Arctic Countries".

Let us see what place was reserved by the Founding Articles for the non-Arctic countries within the IASC and what kind of relations between them and the Arctic countries were therein stipulated. In the Preamble, there was recognized "the important role of, and the need to work closely with, national scientific organizations from countries outside the Arctic regions which have an active and continuing Arctic research programme." On the participation in IASC of representatives of national scientific organizations from the non-Arctic countries is deciding the Council (Art. C. 1 vi). But the participation in the Council is limited and will be open only to "representatives of the organizations of any other countries, during such time as those countries are engaged in significant Arctic research" (Art. C. 2 ii). Since there was no clarification in the Founding Articles how "significant" that research must be, it could be feared that this provision might raise controversies on interpretation, similar to those which have arisen in Antarctica.²³ To reduce that ambiguity, the Council inserted into par. 1. 3 of the 1992 Rules and Procedures a definition, providing that "*significant arctic research* for purposes of IASC shall be evidence of arctic science activity (...), in at least two major fields of enquiry, with published results in the international refereed science literature over a period of at least five years."

Another limitation on membership of non-Arctic countries was imposed in par. 3. 6 of the Rules and Procedures providing that "non-arctic members of IASC may demonstrate periodically that they have a continuing arctic research commitment. Failing such demonstration, their membership may lapse." That requirement might raise doubts, since it does not state clearly how frequent and in what form the members should prove their continuous and active commitment in Arctic research.

International Communication *op. cit.* (note 19) p. 5. "In each northern or arctic country the main scientific effort has to be directed toward domestic priorities and justified as serving nationalistic purposes." Roots E.F. and Rogne O., *op. cit.* (note 19) p. 2.

²³ It should be recalled that similar doubts has raised the interpretation of the notion "substantial scientific research activity" used in Art. IX par. 2 of the 1959 Antarctic Treaty. See: Auburn F.M. 1982. Antarctic Law and Politics, London/Canberra, pp. 149–150 and Machowski J. 1992. Poland's Policies Toward Antarctica. In: 3 German Yearbook of International Law, 34: 67–69.

The position of non-Arctic countries under the Founding Articles was strengthened by the provision of Art. E. 3 which stipulated that IASC Working Groups "may invite scientists or other experts from any country to assist them in their work, with the Council's approval."

In principle, the activities of IASC are based on close cooperation of scientists from both the Arctic and non-Arctic countries. That idea is reflected in the Founding Articles stipulating that the Arctic Science Conference, being one of the IASC organs "will seek the participation of scientists from the broad international scientific community involved in Arctic research" (Art. F. 2). That provision dispels any speculations that IASC might be transformed into an "exclusive club" of the Arctic countries.²⁴

The General Principles outlined in Article A of the Founding Articles serve guidance in all IASC activities.

According to Art. A. 1 "IASC is a non-governmental scientific organization established to encourage and facilitate international consultation and cooperation for scientific research concerned with the Arctic." The non-governmental character of IASC, mentioned at the very outset in the Preamble, is emphasized throughout the whole text of the Founding Articles.

The question whether ICSU and SCAR are bodies sanctioned or supported by governments, or deliberately non-governmental, non-political and strictly scientific, preoccupied the authors of the IASC Founding Articles throughout their drafting process. They tried to find guidance in ICSU and SCAR, both non-governmental international institutions, where members and officers serve in their private capacities and not as representatives of their respective governments; yet each country has a National Committee, sometimes appointed by a government authority. Each system — intergovernmental and non-governmental — has advantages and each has drawbacks. Because of the high cost of scientific activities in the Arctic, virtually all research there is supported ultimately by government or public funds. But, there clearly is a difference between government applied science in the Arctic and fundamental research carried out mostly by universities on theoretical or process problems. Thus, the question before IASC is whether it has to serve both government and non-government science, and how to help to link them together in constructive ways, in an international context.²⁵ Accordingly, in the referred Article such functions of the Committee as encouragement, facilitation, consultation and cooperation for scientific research were specified.

²⁴ In the 1993 IASC Council Meeting, along with the representatives of the Arctic countries, participated members from following 6 non-Arctic countries: France, Germany, Japan, the Netherlands, Poland and the United Kingdom, as well as an observer from Switzerland. See also note 28 below.

²⁵ Roots E.F. and Rogne O., *op. cit.* (note 19), pp. 4–5.

But, the members of the Working Group drafting the Founding Articles considered that the international needs for improved co-ordination and communication in arctic science should be met by simultaneous international action in two complementary areas: non-governmental and intergovernmental. Accordingly they proposed that the Arctic countries "should discuss the feasibility of establishing a mechanism for regular, structured intergovernmental discussions and liaison on arctic science matters" comprising the foundation of an International Forum on Arctic Science Issues, supplementing, but not interfering with the existing bilateral science arrangements.²⁶

According to the next general principle, formulated in Art. A. 2 of the Founding Articles, IASC carrying out its activities in striving for the highest standards of excellence, will "be guided by principle of scientific openness." It is puzzling that after so many decades of secrecy, bans and restrictions, limiting the progress of arctic science, the founders of IASC were reluctant to base it on the principle of freedom of research successfully tested in Antarctica.²⁷ Instead, they preferred to substitute it with the obscure "principle of scientific openness." It can be feared that the launching of that new and unknown principle might raise in the future controversies and disputes on its interpretation and application.²⁸

The subsequent general principles outlined in articles A. 3 and A. 4, define the scope and goals of IASC activities, covering "all subjects and fields of science" for the advancement of world science and for the benefit of the Arctic regions, taking into account "programmes and activities on Arctic research advanced by other scientific organizations" with which it will cooperate whenever appropriate. The need for interdisciplinary and multidisciplinary nature, as well as global range of research, is in polar regions more important than in any other part of the world.

The "founding fathers" of IASC expressed their concern about problems of cooperation and possible interference of the Committee with the national scientific activities and those performed by the existing international arctic science organizations, especially such as Comité Arctique International and the

²⁶ International Communication, *op. cit.* (note 19, pp. 16–17).

²⁷ Machowski J. 1990. The right to freedom of research under the Antarctic Treaty System. *In: Polish Polar Research*, 11 (3–4): 419–434.

²⁸ With very little guidance provides us the leaflet published by the IASC Secretariat and saying: "IASC was founded on the principle of scientific openness, which guides who can become a member, how to propagate a scientific agenda, and how to disseminate results. This means that: any country engaged in significant scientific research in the Arctic can become a member; experts from member countries and non-member countries can participate in IASC Working Groups; cooperation with other scientific organizations is encouraged; data shall be freely exchanged." *The Role of IASC in International Science*, p. 2 also IASC the 1993 Council Meeting, Report, 21–24. IV. 1993, Abisko, Sweden. Appendix III, p. 2. Nonetheless, as part of its long-term strategy to achieve its mission, IASC is "providing for freedom and ethical conduct of science." *IASC Mission and strategy*. Appendix IV, *Ibid.* p. 2.

Arctic Ocean Sciences Board and others.²⁹ At the preliminary discussions in San Diego there was done a quick review of existing international Arctic-related organizations as they existed at that time, and the members present concluded that these organizations and the functioning structures did not meet the present needs of arctic science, either because of a very limited membership or restriction only to one or few scientific disciplines.

Generally, in its policy IASC welcomes cooperation with other scientific organizations, provided there is a mutual benefit to both parties, and that the relationship is clearly defined. One of IASC's objectives is to initiate multidisciplinary research programmes for all the Arctic.

The problem of non-interference in national scientific activities and independence of action is treated even broader in the General Principles, providing in Art. A. 5 that "IASC will not interfere with the scientific activities of any country or group of countries carrying out research in the Arctic, nor commit governments to support or approve programmes or activities." That policy was amplified in the subsequent principles outlined in articles A. 6 and A. 7, providing that "the activities of IASC should be consistent with the regional interest of the Arctic countries" and "will in no way affect the rights or obligations of countries under international law with respect to scientific research in areas within their jurisdiction."

All the referred reservations and cautions seem comprehensible and justifiable in the light of the earlier presented political and strategic realities of the Arctic region.

The structure of IASC outlined in the Founding Articles was drawn so as to meet the basic needs of arctic science and enable the Committee to fulfill its functions. Accordingly, IASC was structured along the lines of regional and topical bodies. The IASC is composed of following bodies: 1. the Council, 2. the Regional Board, 3. Working Groups, 4. the Arctic Science Conference and 5. the Secretariat.

The Council (Art. C) is a policy and decision-making body, consisting of one representative selected by each national adhering organization to represent the national scientific community.³⁰ An Executive Committee of the Council is selected and is responsible for IASC matters between Council meetings. The Council has its responsibilities among others; to develop policies and guidelines for cooperative scientific research, to establish Working Groups, to endorse plans developed by them, to recommend scientific programmes and projects, as well as implementation plans for IASC programmes and activities, to decide on

²⁹ Roots E.F. and Rogne O., *op. cit.* (note 19), pp. 9–12 and International Communication, *op. cit.* (note 19), pp. 8–9.

³⁰ According to the definition contained in par. 1.4 of the 1992 Rules and Procedures "National scientific organization refers to a single national body that reflects the views of the arctic scientific community within a country and which in that capacity designates a representative to the Council. Such a designated national body shall be hereafter termed the Council member in the rules and procedures."

the participation of representatives of national scientific organizations from the non-Arctic countries, to organize Arctic Science Conferences and to establish Rules and Procedures guiding the IASC work (Art. H).³¹ The Council is carrying out its functions on the basis of consensus.

The Regional Board (Art. D) is a body consisting of representatives of the national organizations of the eight Arctic countries, representing the scientific community of their countries and carrying out their work on the basis of consensus. The Board considers regional problems and other questions which affect the interests of the Arctic countries.

Working Groups (Art. E) are scientific bodies which provide the main fora for developing IASC programmes and activities by means of exchange of information, discussion of problems, methods and research directions and identification of opportunities for cooperation. Working Groups are the basic bodies in IASC activities, since they are developing and recommending to the Council proposals for programmes and projects. The Council is defining or approving guidelines for each Working Group, covering as appropriate the subject, scope, objectives, size, reporting responsibilities, scheduling and financial or other arrangements (par. 3. 11 of the Rules and Procedures).

Working Groups are composed of scientists with expertise from IASC member and non-member countries. The latter are invited by respective Working Groups with the Council's approval.

During its first three years, IASC has established several Working Groups, charging them with specialized tasks. So far, following IASC Working Groups were founded or are in the process of organization:

(a) *The Working Group on Global Change* was the first one to have been organized with the task of coordinating responsibilities for the Arctic region. After a successful workshop in April 1992 in Reykjavik, Iceland, the Group proceeded with a draft on Scientific Plan for a Regional Research Programme in the Arctic on Global Change, scheduled to be edited and published by the end of 1993. A new coordinating structure is being established for the implementation of this plan. As several Global Change programmes and major projects are ongoing or planned, the Group will include appropriate representation from these as well as from major disciplines.

(b) *Ad Hoc Group on Arctic Glaciers* was established at the IASC Council Meeting in April 1992 with members from 12 different countries and with the task to initiate cooperation between arctic glaciologists and to establish a Working Group for arctic glaciers. The Group will establish liaison with the International Commission of Snow and Ice and the World Glacier Monitoring Service. The research initiated by that Group will be under the umbrella of Global Change studies in the Arctic.

³¹ IASC, The 1992 Council Meeting, Report, 27–29. IV. 1992, Reykjavik, Iceland, Appendix IX, Rules and Procedures, pp. 1–4.

(c) *Working Group for Geophysical Compilation and Mapping* initiated at the 1992 Council Meeting is concerned with studies in bathymetry, magnetic gravity, seismic and geological problems. That Group was founded to foster international cooperation in the development and use of research – grade geophysical data bases for Arctic investigations.

(d) *Working Group for Marine Geological Sciences* was initiated at the 1992 Council Meeting to study among other the areas covered with permanent sea ice, the marine sediment records, the ice-atmosphere-ocean interactions in the Arctic and control/response in climatic changes as well as the general Arctic marine geosciences. The aim of that Group is to stimulate information exchange and scientific cooperation within the Arctic marine geology community. There are three subgroups covering paleo, sediment dynamics and tectonics.

(e) *Advisory Group on Arctic Human and Social Sciences* was initiated at the 1992 Council Meeting with the task to develop a prioritized list of circumpolar science proposals in human and social sciences, to consider multidisciplinary projects integrating human and social sciences with biological and physical sciences and to suggest feasible circumpolar multidisciplinary science projects. Alongside with scientists, representatives of the three major Arctic indigenous organizations³² were included into the Group, while the International Arctic Social Sciences Association (IASSA) was affiliated with IASC.

(f) As a *Working Group on Medical and Health Science* initiated at the 1992 Council Meeting, serves actually the Council of the International Union of Circumpolar Health. Its task is to consider and develop a plan for an Arctic medical research and health monitoring programme.

(g) *Working Group on the International Scientific Initiative in the Russian Arctic* was established at the 1993 Council Meeting.

The Arctic Science Conference (Art. F) is an interdisciplinary meeting of the broad international scientific community involved in Arctic research, convened periodically by the IASC to identify key scientific questions and issues. The Conference is providing an international forum to review the current status of arctic science, to provide scientific and technical advice, to promote cooperation and links with other organizations and to increase understanding and support for the work of the IASC. The Rules and Procedures are recommending in par. 3.16 to organize the Arctic Science Conference to coincide with another scientific meeting.

The Council decided that 1997 would be a suitable year to convene the first Arctic Science Conference with the working title "Priorities in Arctic Science."

The Secretariat (Art. G) is located in Oslo, Norway and provides information and secretarial services to all bodies within IASC and information about

³² They are: the Nordic Saami Council, the Association of Small Peoples of the Russian North and Inuit Circumpolar Conference.

IASC to others. The Secretariat is directed by an Executive Secretary responsible to the Council.

IASC activities and perspective

The results of the three Council Meetings held in 1991, 1992 and 1993, allow to draw some conclusions on IASC activities and perspective. The list of topics taken up is long and the scope of problems before IASC is wide. Thus, let us take a brief review of the few selected items on the agenda of IASC Council Meetings.³³

As part of IASC mission and strategy, the Council considered *the problem of relation to other organizations*. One of the intentions behind IASC was to serve as an umbrella for already established arctic science organizations and groupings. In this spirit the Council drafted a model letter addressed to these organizations.³⁴ It also noted, that it would be desirable to develop a relation between managers in both polar regions, and in particular between IASC, ICSU and SCAR. The alternatives for IASC to establish a relationship with ICSU were a standing scientific committee or an associate. As merger with SCAR was not likely in the near future, the Council agreed to apply in due course for associate status with ICSU. Also merging with SCAR does not seem practical, thus the Council agreed to develop with that body closer scientific bipolar cooperation of mutual interest.

At the consecutive Council Meetings a number of interesting *scientific initiatives* was advanced, as the earlier mentioned Global Change research in the Arctic, human and social sciences studies, geophysical compilation and mapping, marine geology studies, ocean studies, arctic glaciers investigation, arctic ozone depletion causes and effects, cooperation in space geodesy and geodynamics, circumpolar research on the impact of climate change in the Arctic.

Taking into account some alarming reports on the situation in Russian arctic science, the Council members paid special attention to *the International Scientific Initiative in the Russian Arctic (ISIRA)*. The Executive Secretary prepared a working paper entitled "The Great Siberian — From the Barents to the Bering Sea." Also a paper by Academician I.S. Gramberg entitled "Zemlya

³³ The 1992 Council Meeting Report, 27–29 April, 1992, Reykjavik, Iceland and The 1993 Council Meeting Report, 27–29 April, 1993, Abisko, Sweden.

³⁴ So far, IASC established close relations and cooperation among other with MAB/Northern Science Network, Arctic Ocean Sciences Board (AOSB), the International Permafrost Association, the European Committee on Ocean and Polar Science (ECOPS), International Union for Circumpolar Health, International Arctic Social Sciences Association (IASSA), International Council for Snow and Ice (ICSI). There are a number of other organizations with which IASC is negotiating its relationship, but not yet finalized. For full list of arctic science organizations see: IASC, Acronyms and Abbreviations for the Polar Science Community, December, 1992.

Frantsa Iosifa (Frantz Josef Land, north-eastern Barents Sea)" was circulated. Both papers received favourable comments and support. In result of an extensive exchange of views the Council agreed that ISIRA was an important initiative to which IASC should give priority and a special group should assemble necessary information, identify international science programmes than can provide benefit, assist Russian scientific community in arctic projects, as well as develop ISIRA structure and identify committees needed.

Other important scientific and organizational projects were initiated by the Council in the sphere of *ecology and environmental protection*. IASC had been invited to the First Ministerial Conference on the Protection of the Arctic Environment in June 1991 and its Declaration on the Protection of the Arctic Environment and the Antarctic Environmental Protection Strategy which were included in the Council's agenda papers. IASC has been also invited to the first meeting of the Arctic Monitoring and Assessment Programme (AMAP) Task Force in Tromso, Norway in December 1991 and the Committee's proposals were recorded in the minutes of that meeting. At the workshops concerned with the development and implementation of cooperative measures for the Conservation of Arctic Flora and Fauna (CAFF) under the International Arctic Environmental Protection Strategy held in Ottawa, Canada on 7–8 April, 1992 and Fairbanks, Alaska on 25–27 May, 1993, IASC had been invited to participate in several areas covering that programme which is concerned with threats to habitats and reasons for such threats, with critical species and populations as well as identification of endangered species of arctic flora and fauna. AMAP and CAFF are the two "scientific legs" of the Arctic Environment Strategy. At the 1993 Council Meeting a proposal was tabled suggesting to convene a multimedia workshop to evaluate the scientific knows and unknowns about the sources, fates and effects of pollution in the Arctic. At the same meeting the problem of radioactive waste in the Arctic was considered.

The above mentioned examples of IASC activities indicate that the Committee has in relatively short time succeeded to meet the increasing need for scientific knowledge of the Arctic region by means of broad circumpolar and international cooperation of multidisciplinary and interdisciplinary character.

Poland and arctic science

Polish scientists participated in the formation of IASC from the very beginning³⁵, contributing to its foundation and organization. At present, the Polish scientific community is represented in IASC by the Committee on Polar Research of the Polish Academy of Sciences (PAS) and its Chairman Professor Krzysztof Birkenmajer.

³⁵ See note 18.

The continual interest of Poland in the Northern Polar region is reflected in the history of its involvement in arctic science. Although Polish interest in the Arctic was continuous, scientific research conducted there by Poles has for a long time been limited and sporadic due to political reasons and often interrupted by historic upheavals.

The first recorded Polish investigations in the Arctic region date back to the nineteenth century and were performed by scientists — geologists, biologists and glaciologists — deported to Siberia by the Russian tsarist regime³⁶.

In the inter-war period Poland participated in the Second International Polar Year organizing a year-round expedition on the Bear Island (Bjornoya) in 1932/33. During the period 1933–1938 four more Arctic Polish Expeditions were organized to Svalbard (Spitsbergen) in 1934, 1936 and 1938 and one expedition to West Greenland in 1937.

As a nation with a long-standing tradition and significant experience in polar exploration and research, Poland emerged after World War II as an outstanding candidate for the resumption of scientific investigation in the Arctic. Almost on the day after the end of war, a group of surviving Polish polar explorers (Centkiewicz, Dobrowolski, Jahn, Kosiba, Manczarski, Siedlecki, Różycki) undertook with the governmental and academic authorities the necessary steps aimed at the reconstruction of Polish polar research potential, its extension to Antarctica and the organization of polar scientific expeditions and stations. But the political and economic situation prevailing at that time in Poland was extremely unfavourable for such initiatives. The close linking of science with centrally planned economy in a country heavily devastated by war, left to the senior polar explorers little room for action. In effect, the general conditions prevailing in the early post-war years compelled them to turn towards theoretical studies and training of a new generation of young polar explorers for future expeditions.

In result of the co-incidence of opportune international and internal events and removal of political and economic obstacles obstructing the earlier resumption of polar exploration, in the mid-fifties the Polish scientists resumed their activities in the Arctic.

It was the IGY which gave the arctic science in Poland a new impetus and gained the country some creditable expertise in modern polar research matters. The IGY, which was preceded by the "thaw" in East-West relations, the easing of the Communist party grip on science in the Eastern bloc countries after the Twentieth Soviet Communist Party Congress, created a favourable atmosphere for Polish polar explorers not only to resume activities in the Arctic, but to

³⁶ The most prominent among them were: Bogdanowicz, Ciagliński, Czekanowski, Czerski, Dybowski, Hryniewiecki, Jaczewski, Morozowicz, Ordyński, Piwowar, Wołosowicz, Trzemeski. Polish scientists participated in that period also in polar expeditions organized by other nations. In 1913 Professor E. Romer visited and investigated Alaska. Numerous geographical sites in the Arctic bear their names commemorating their achievements and contribution to science.

extend them to Antarctica. The political and economic changes, which ended in 1956 the Stalinist era in Poland, stimulated its activity in international relations, including scientific relations, and resulted among other in a more favourable approach of the Polish authorities towards polar research projects submitted to them by the scientists.³⁷

Poland was a latercomer to the Arctic, but its location in the Northern Hemisphere, the relative proximity to the Polar Circle and close neighbourhood with the Arctic countries, rapidly developed interest shown by the nation in this remote region. The considerable widening of Poland's access to the sea and fast development of the shipping after the Second World War, opened new avenues for Polish investigations in the Arctic, including the sending there of annual scientific expeditions and establishment of permanent research stations.

By the end of the IGY the interest in polar research, stemming from the pre-war traditions, increased rapidly in Poland. Several Polish university centres initiated in the late fifties independent polar research in Svalbard, in Greenland, in Iceland, on Jan Mayen, in Alaska, as well as in northern parts of Norway, Canada and the U.S.S.R. In the PAS, the Institute of Geophysics assumed the responsibility of preparation, coordination and direction of polar scientific expeditions to Svalbard and Antarctica, with the goal to establish there Polish permanent research stations.³⁸

After the IGY, during an almost ten years long period (1961–1969), the Polish polar research suffered a set-back caused by political and economic reasons. At that time, individual Polish scientists joined foreign polar expeditions. Also some Polish mountaineering parties explored Svalbard. The systematic Arctic research was resumed in 1970 after the rebuilding and modernization of the Hornsund station on Svalbard. The PAS was joined in arctic research by several university centers, in particular from Wrocław, Toruń, Cracow, Łódź, Gdańsk, Poznań, Lublin, Szczecin and Silesia.³⁹ The departmental research institutes, like the Marine Fishing Institute at the Maritime Economy Office or the Merchant Marine Schools in Gdynia and Szczecin became involved in marine arctic research penetrating with the research ships

³⁷ Jahn A. 1979. The origin and history of the Polish polar ideas (in Polish). *In: Czasopismo Geograficzne* 50, 1–2; 3–18; Jahn A. 1989. The Polar Club and its history (in Polish). *In: Achievements and perspectives of Polish polar research*, XVI Polar Symposium, Toruń 19–20. IX. 1989; 15–40.

³⁸ Polish scientific activities in the Arctic were resumed in 1956 on Svalbard as part of the IGY and continued in 1959/60 as part of the Interantional Geophysical Cooperation, while the PAS established a permanent Polish research station at Hornsund Bay on Svalbard. In these expeditions for the first time participated Polish research and transportation ships.

³⁹ The results of the arctic expeditions organized by the universities are published in numerous local editions i.e. Jahn A. 1961. Polish IGY Spitsbergen Expeditions in 1957, 1958 and 1959, Uniwersytet Wrocławski, *Zeszyty Naukowe, Nauki Przyrodnicze, seria B*, no 5, *Nauka o Ziemi II*; 3–54 and in the five volumes of the "Geographical Expeditions to Spitsbergen" published periodically by the Maria Curie-Skłodowska University in Lublin.

Siedlecki and *Kopernik* successfully the remotest sea areas in the north. Transport vessels *Turlejski*, *Garnuszewski*, *Ledóchowski* and *Perkun* offered Polish arctic expeditions the necessary logistic support.

The resumption of scientific activities in the Arctic and Antarctica was accompanied by a radical organization change of the administration and management of polar research in Poland, taking into account the existing political, economic and financial realities at home and abroad. Economic incentives, such as the development of the deep-sea fishing, created the need for large scientific environmental exploration of the arctic seas. Some notable successes which were achieved in this respect have led to the drawing of an effective national policy⁴⁰ and establishment of special coordination framework of polar research.⁴¹ To perform these duties, the Committee on Polar Research, affiliated with the Praesidium of PAS was established in 1978 and reorganized in 1981, when a Secretariat for Polar Research was founded.⁴²

The research goals in the Arctic, outlined in the executive decisions of the Council of Ministers, PAS and departments concentrate on three main scientific areas: biology, earth sciences and oceanography.⁴³

Soon, it became clear that without sensible national policy no effective scientific programme can develop, and without coordination any existing research effort must always remain fragmented, costly and inefficient in remote regions like Arctic. Having on mind this verity and following rather the West-European than American pattern of management, Poland has retained the mentioned system of coordination of polar research even after transition from the centrally planned to free market economy at the turn of eighties and nineties.

Poland has great incentives to continue to study the Arctic. Numerous past Polish research projects in the Arctic have been outstanding and its commitment to arctic science remained unshaken, in spite of the present economical

⁴⁰ National policy in polar regions was outlined in a series of Resolutions passed by the Council of Ministers providing the legal framework for the development and conduct of polar research. See Resolutions No. 246/76 of 7. XII. 1976, No. 173/77 of 29. XI. 1977, No. 46/82 of 5. III. 1982 and No. 111/86 of 28. VII. 1986. With the exception of the first, concerning exclusively research activities in Antarctica, the remaining Resolutions deal with general organizational and financial implications of polar research in both — the Arctic and Antarctic — regions.

⁴¹ In the Resolution No. 111/86 of 28. VII. 1986, "in order to safeguard the political, economic, scientific and research interests in polar regions", the Council of Ministers has authorized PAS "to conduct and coordinate polar research, as well as to organize and coordinate polar scientific expeditions to the Antarctic and Arctic regions" in cooperation with the departments concerned.

⁴² The Committee on Polar Research PAS was founded by the Resolution No. 3/78 passed by the Praesidium of PAS on 17. III. 1978 and was reorganized by the Decision of the PAS Scientific Secretary of 2, IX. 1981 and again by the Resolution No. 15/90 adopted by the Praesidium of PAS on 19. VI. 1990 when its composition was changed and the number of members increased to 47.

⁴³ For a detailed account see: The state and prospects of Polish polar research. In: 1984, *Acta Academiae Scientiarum Polonae*; 3–4; 99–115 and Birkenmajer K. 1989. Report on the state and perspective of Polish polar research (in Polish). In: *Nauka Polska*, 4–5; 21–38.

and financial restraints. Poland's access to IASC allows to cherish hopes that this commitment will be greater in the future and that there will be a genuine desire to cooperate in scientific projects with other nations and that the Arctic will be viewed with greater foresight and vision in the future.

Conclusion

Since a long time there was urgent need for an international arctic science and research policy able to establish a clear and coherent arctic research programme comparable to that elaborated by SCAR for Antarctica. The earlier presented obstacles deferred that task, which now, with considerable delay, is taken up by IASC. Such a research programme should address a suite of scientific issues concerned with environmental protection in relation to living and mineral resource exploitation, glaciology, air, water and ice pollution, climate change, and a better understanding of the physical, biological and social environment of the Arctic. That international research programme must be coordinated and partly integrated with national policies of the Arctic countries for economic, technical and social progress, resource development, environmental protection and national security. No less important is the close cooperation in this area with the non-Arctic countries concerned. With that goal in mind, it seems necessary to support the non-governmental IASC efforts with adequate intergovernmental initiatives and arrangements. It can be expected that, as the pace of Arctic development quickens, the level of interaction will increase, in spite of the fact that the close polar neighbours frequently express different viewpoints and goals regarding their national interests in the region.

The enormous intensification of activities in the Arctic during the post-war decades has resulted in the aggravation of potential conflicts of interest between the rim countries. From the highly politicized issues of defence, energy supply and jurisdictional claims, to the concerns with transportation, environmental protection, native rights and last but not least scientific research, the Arctic nations are operating on a delicate and sensitive stage where the potential both for local conflict and incentives for peaceful cooperation are profound. But it must be kept in mind that the perspectives on the arctic issues differ from country to country. Some of them tend toward international cooperative arrangements, reinforced by traditional multilateralist instinct and regional and global position, while others prefer bilateral solutions. Probably the greatest deterrent to bilateral cooperation remains the divergent positions of the Arctic states at international level including the United Nations forum, on such like the LOS Convention, the polar sector doctrine etc. But, in assessing possible institutional arrangements other than bilateral or United Nations based multilateral devices, it is necessary to look closely at their workability.

Although the Arctic is geographically remote, jurisdictional issues there have become increasingly problematic. The commercial developments in the Arctic and the promotion of the new rules of LOS, have increased political and legal pressures in several disputed marine boundary areas, threatening to disrupt future peaceful relations in the region, including scientific cooperation. A longer term possibility, especially after the extinction of the East-West Cold War, would be for the nations that border the Arctic Ocean to develop a regional cooperative approach to protect their political, strategic, economic, environmental and scientific interest. The short term likelihood of such a regional effort lies rather in many areas of common interest and concern that could produce some form of functional cooperation in the region, possibly based on circumpolar non-governmental organizations such as the mentioned Eskimo peoples ICC or IASC, which could pave the way for transarctic diplomacy.⁴⁴

In spite of this complex political setting, IASC has succeeded in surprisingly brief time to occupy a prominent place in the family of existing arctic science institutions. After its few years of experience, the hope can be cherished that IASC position in the Arctic will rise faster.

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Streszczenie

W odróżnieniu od Antarktyki, w Arktyce przez cały okres powojenny, z przyczyn politycznych i strategicznych, brakowało odpowiedniej platformy dla wielodyscyplinarnej i międzydyscyplinarnej, wielostronnej międzynarodowej współpracy naukowej. Tę lukę wypełnił powołany w 1990 r. pozarządowy Międzynarodowy Komitet Nauk Arktycznych (IASC), którego genezę, strukturę, działalność i perspektywy przedstawiono w niniejszym artykule.

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⁴⁴ Bloomfield L.P. *op. cit.* (note 17); 87–105. The intergovernmental cooperation on protection of the arctic environment (AEPS) is a first step in intergovernmental cooperation in the Arctic. IASC paved the way for this initiative, as several of the issues discussed and solved in the IASC planning could be adopted also for the governmental cooperation. Canada has suggested an International Arctic Council, *i.e.* an intergovernmental body that could discuss any issue (not only environmental questions). Discussions on that issue are still ongoing.